THE LAKEHEAD REGION CONSERVATION AUTHORITY
THUNDER BAY AREA AQUIFER CHARACTERIZATION
GROUNDWATER MANAGEMENT AND PROTECTION STUDY
FINAL REPORT

Submitted to:

Lakehead Region Conservation Authority
and the
Ontario Ministry of the Environment

Submitted by:

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LIST OF ACRONYMS

AO	Aesthetic Objective
AST	Aboveground Storage Tank
BMP	best management practices
BP	before present
CN	Curve Number
DEM	Digital Elevation Model
DOC	Dissolved Organic Carbon
EBR	Environmental Bill of Rights
EPA	Environmental Protection Act
ET	evapotranspiration
Ga	billion years
GIS	Geographic Information System
GPS	Geographic Positioning System
HYMO	a hydrologic model
I	infiltration
IAO	Insurer's Advisory Organization
Igpd	Imperial Gallons per day
Igpm	Imperial Gallons per minute
IKONOS	satellite imagery
ISI	Intrinsic Susceptibility Index
K	hydraulic conductivity
LRCA	Lakehead Region Conservation Authority
m amsl	metres above mean sea level
MAC	Maximum Acceptable Concentration
MDEQ	Michigan Department of Environmental Quality
MDNM	Ministry of Northern Development and Mines
MNR	Ministry of Natural Resources
MODFLOW	computer software for modeling
MODPATH	computer software for modeling
MOE	Ministry of the Environment
MOEE	Ministry of Environment and Energy (previous MOE)
MSRR	Minimum Service Rural Residential
MTO	Ministry of Transportation of Ontario
NRVIS	Natural Resources and Values Information System
NW-SE	Northwest by Southeast
OBM	Ontario Base Mapping
ODWS	Ontario Drinking Water Standard(s)
OG	Operational Guideline
OGS	Ontario Geological Survey
OMAF	Ontario Ministry of Agriculture and Food
OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs

OPA/ZBA	Official Plan Amendment or Zoning By-Law Amendment
OTTHYMO	Ottawa hydrologic model
PCB	Poly Chlorinated Biphenyl
PCBs	Polychlorinated Biphenyls
PSOC	potential sources of contamination
PTTW	Permit To Take Water
PWQO	Provincial Water Quality Objective(s)
R	runoff
R.S.O.	Revised Statutes of Ontario
SCS	Soil Conservation Service
SPPB	Source Water Protection Planning Board
STP	Sewage Treatment Plants
TAC	Technical Advisory Committee
TOT	Time of Travel
TSSA	Technical Standards and Safety Authority
TTOR	Technical Terms of Reference
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
VIEWLOG	type of environmental software
WHPA	Wellhead Protection Area
WPCP	Water Pollution Control Plant
WWIS	Water Well Information System

Glossary of Groundwater Terms*

Alluvium	Sediments consisting of silt, sand, clay, and gravel in varying proportions that are deposited by flowing water in marshes or valleys.
Aquifer	A saturated geologic formation (rock or sediment) capable of storing, transmitting and yielding reasonable amounts of groundwater to wells and springs.
Anthracite-Sand Filtration	Filter sand used to separate suspended matter from the water. Anthracite is a type of "hard" coal, with a high percentage of fixed carbon.
Anthropogenic	Influenced by human activity.
Archean Volcanics	Older Precambrian rocks formed from ancient volcanic activity.
Artesian Aquifer	See *Confined Aquifer* below.
Artesian Well	A vertical bore hole in which a pipe-like structure is inserted into the ground so that it withdraws water from a confined aquifer (artesian aquifer).
Attenuation	The soil's ability to lessen the amount of, or reduce the severity of groundwater contamination. During attenuation, the soil holds essential plant nutrients for uptake by agronomic crops, immobilizes metals that might be contained in municipal sewage sludge, or removes bacteria contained in animal or human wastes.
Attenuation Zone Boundary	Zone of reduction, or of less density.
Baseflow	The sustained flow (amount of water) in a stream that comes from groundwater discharge or seepage. Groundwater flows underground until the water table intersects the land surface and the flowing water becomes surface water in the form of springs, streams/rivers, lakes and wetlands. Baseflow is the continual contribution of groundwater to watercourses and is important for maintaining flow in streams and rivers between rainstorms.
Bedrock	Solid or fractured rock usually underlying unconsolidated geologic materials; bedrock may be exposed at the land surface.
Calibration	The process whereby a numerical model is adjusted so that the calculated and observed parameters converge. When a numerical model is calibrated, the process is complete
Capillary Fringe	Saturated zone immediately above the water table where saturation is maintained by capillary tension exerted within soil pores.
Capture Zone	A term used to represent an area where water originates and moves to a water well. Typically, capture zones are a two dimensional representation of a three dimensional space.
Carbonates	A compound containing CO_3^{+2}, also known as a salt of carbonic acid.

* Sources: The Penguin Dictionary of Geology, MOE, and Modern Physical Geography, Strahler and Strahler

Glossary of Groundwater Terms*

Cherts	When qualifying as mineral, a chert is considered a cryptocrystalline type of quartz whose matrix is indiscernible under the microscope. As a rock, cherts are a silicon-based and have different colors made of microorganisms or precipitated silica grains.
Chlorine Disinfection	The destruction or elimination of disease carrying microorganisms through the use of a chlorinated solution.
Coagulation-Flocculation	A term used to describe a process where water is purified at a water treatment plant.
Condensation	The process by which water or other liquids change from gas vapour to a liquid; process that occurs when water droplets form on surfaces or around the nuclei of a particle.
Cone of Depression	The zone (around a well in an unconfined aquifer) that is normally saturated but becomes unsaturated as a well is pumped; an area where the water table dips down forming a "V" or cone shape due to a pumping well.
Confined Aquifer (artesian aquifer)	An aquifer holding water under pressure by a layer above it that does not allow water to pass through. Due to pressure, the water level of a well in a confined aquifer will rise above the top of the aquifer.
Confining Layer (aquitard)	Geologic material with little or no permeability or hydraulic conductivity. Water does not rapidly pass through this layer or the rate of movement is extremely slow.
Conglomerate	Pieces of rock that have been worn down by water flow and rounded into smooth pebbles, which then get cemented together by another mineral.
Contaminant (pollutant)	Any substance that makes water unfit for a given use.
Contaminant Plume	A term used to describe a mass of contamination moving underground.
Cubic Feet per Second (cfs)	The volume of water in cubic feet (one-foot cube) that passes a given point in one second of time; U.S. Geological Survey uses this measurement in reporting streamflow values.
Cumec	A unit of measurement for the flow of water, equal to one cubic meter per second (35.3147 cubic feet per second).
Deltaic or Stratified Drift Deposits	All drift deposits originate as an accumulation of glacial material. Deltaic drift deposits originate as an alluvial deposit, usually triangular in shape, at the mouth of a river. Stratified drift exhibits both "… sorting and stratification, implying deposition from a fluid medium such as water and air.
Diabase	A slightly metamorphosed medium-grained basic igneous rock.
Discharge Area	An area where groundwater emerges at the surface; an area where upward pressure or hydraulic head moves groundwater towards the surface to escape as a spring, seep, or baseflow of a stream.
Discretization	Making mathematically discrete.

* Sources: The Penguin Dictionary of Geology, MOE, and Modern Physical Geography, Strahler and Strahler

Glossary of Groundwater Terms*

Downgradient	A term used in hydrogeology to describe a point at a lower hydraulic head.
Drainage Basin	The land area from which surface runoff drains into a stream or lake.
Equipotential	A series of points of equal hydraulic head or elevation.
Evaporation	The process by which water or other liquids change from liquids to a gas vapour; evaporation can return infiltrated water to the atmosphere from upper soil layers before it reaches groundwater or surface water, and occur from leaf surfaces (interception), water bodies (lakes, streams, wetlands, oceans), small puddled depressions in the landscape.
Evapotranspiration	The sum of evaporation plus transpiration.
Feet per Second (ft/sec)	The distance in feet that an object or water moves downstream in one second of time.
Felsic	A term used to describe a characteristically light-coloured silicate mineral such as quartz or feldspar.
Filtering	The soil's ability to attenuate substances which includes retaining chemicals or dissolved substances on the soil particle surface, transforming chemicals through microbial biological processing, retarding movement, as well as capturing solid particles.
Flow System	Groundwater flow from the recharge area to a discharge area; three levels of regional, intermediate, and local. In a regional flow system, the recharge area is at the basin or watershed divide and the discharge area is at a river in the valley bottom. In a local flow system, the recharge area is at a topographical high spot and the discharge area is at a nearby topographical low spot.
Geology	The study of science dealing with the origin, history, materials and structure of the earth, together with the forces and process operating to produce change within and on the earth.
Glacial Drift	Sediment transported or deposited by glaciers or by the water melting from a glacier.
Glacial Lake	A lake created when glacial meltwaters are ponded in a basin scoured out by glacial ice, or from the damming of natural drainage by glacial materials such as till.
Glacial Outwash	Well-sorted sand, or sand and gravel deposited by water melting from a glacier.
Glacial Till	Nonsorted, nonstratitified sediment deposited or transported by glacial activity.
Glaciolacustrine	A term used to describe fine-grained glacial materials deposited in glacial lake environments.
Groundwater	The water below the water table contained in void spaces (pore spaces between rock and soil particles, or bedrock fractures).

* Sources: The Penguin Dictionary of Geology, MOE, and Modern Physical Geography, Strahler and Strahler

Glossary of Groundwater Terms*

Groundwater Basin	The underground area from which groundwater drains. The basins could be separated by geologic or hydrologic boundaries.
Groundwater Divide	The boundary between two adjacent groundwater basins, which is represented by a high point in the water table.
Groundwater Vulnerability	The probability of contaminants propagating to a specified region in the groundwater system after introduction at some location above the uppermost aquifer
Hydraulic Conductivity	The term used to describe the rate at which water moves through a medium; a controlling factor on the rate at which water can move through a permeable medium.
Hydraulic Gradient	Rate of change of pressure head per unit of distance of flow at a given point and in a given direction.
Hydraulic Head (head)	The energy that causes groundwater to flow; the total mechanical energy per unit weight; the sum of the elevation head and the pressure head.
Hydrodynamic Parameters	Of or relating to the force or pressure of water or other fluids.
Hydrogeology	The study of the interrelationships of geologic materials and processes with water, especially groundwater.
Hydrology	The study of the occurrence, distribution, and chemistry of all waters of the earth.
Hydrostratigraphic	A term used to describe a geological unit with similar hydrogeological parameters.
Impermeable	Not allowing water to pass through.
Infiltration	The process of water moving from the ground surface vertically downward into the soil.
Input Parameters	A term used in groundwater modelling to describe a number of physical parameters used to generate the numerical model.
Interbedded Argillites	Argillite is a type of rock having a higher degree of induration (cementation of hardness) than mudstone but less than shale.
Interception Loss	Precipitation that is intercepted by trees, vegetation, and/or buildings and evaporates quickly back into the atmosphere before reaching the ground.
Interflow (subsurface storm flow)	Water that travels laterally or horizontally through the zone of aeration (vadose zone) during or immediately after a precipitation event and discharges into a stream or other body of water.
Intrinsic Susceptibility	Intrinsic susceptibility, in its simplest form, is a measure of the natural protection of an aquifer from overlying layers with low permeability.
Lacustrine	Pertaining to, produced by, or formed in a lake or lakes.
Late Wisconsinan Age	The later portion of the Wisconsin, which is the last of four classical glacial stages (Kansan, Nebraskan, Illinoian) in the Pleistocene of North America.

* Sources: The Penguin Dictionary of Geology, MOE, and Modern Physical Geography, Strahler and Strahler

Glossary of Groundwater Terms*

Leachate	A liquid formed by water percolating through soil or soluble waste as in a landfill.
Leachate Impacted	Area affected by leachate contamination.
Leaching	The natural process by which water transports salts and other soluble materials through the soil.
Lithologic	The composition and physical features of rocks.
Mafic	Term used to describe a characteristically dark-coloured subsilicic mineral usually contrasted to felsic.
Mass Balance	A term used to describe a process of inputs and outputs, which must equal in quantity.
Maximum Acceptable Concentration (MAC)	The term used for limits applied to substances above which there are known or suspected adverse health effects.
Metasedimentary	Partly metamorphosed sedimentary rock.
Metavolcanics	Partly metamorphosed volcanic rocks.
Micrograms per Litre (ug/l)	A measure of the amount of dissolved solids in a solution in terms of micrograms of solid per litre of solution; Equivalent to part per billion in water or 1µg/l=1ppb.
Milligrams per Litre (mg/l)	A measure of the amount of dissolved solids in a solution in terms of milligrams of solid per litre of solution; Equivalent to part per million in water or 1mg/l=1ppm.
Model Domain	The boundaries of a numerical model.
Monitoring Well	A non-pumping well, generally of small diameter, that is used to measure the elevation of a water table or water quality. A piezometer is one type of monitoring well.
Moraine	An accumulation of earth and stones carried by a glacier and usually deposited into a high point like a ridge.
Multi-Variant Analysis	A statistical analysis technique in which multiple variables are analyzed separately to determine the contribution made by each variable to an observed result.
Municipal Well (public or community well)	A pumping well that serves 5 or more service connections.
Nitrate (NO_3)	A chemical formed when nitrogen from ammonia (NH_3), ammonium (NH_4) and other nitrogen sources combines with oxygenated water.
Non-point Source Pollution	Pollution from dispersed sources like agricultural activities, urban runoff, and atmospheric deposition.

* Sources: The Penguin Dictionary of Geology, MOE, and Modern Physical Geography, Strahler and Strahler

Glossary of Groundwater Terms*

Orthophoto Mapping	The ortho process corrects for distortions caused by the terrain, the orientation of the airplane and the camera lens. Unlike traditional warping, or rubber-sheeting techniques, orthorectification results in a planimetric image that allows users to accurately measure distances and areas. In the simplest terms, an ortho image is like a photo that has been draped over the ground like spreading a blanket over an uneven surface.
Outwash Sand	Sand drift, which becomes deposited by melt-water streams.
Overburden	Any loose unconsolidated material, which rests upon solid rock.
Part per Billion (ppb)	A measure of the amount of dissolved solids in a solution in terms of a ratio between the number of parts of solids to a billion parts of total volume; Equivalent to microgram per litre in water or 1ppb=1 µg /l.
Part per Million (ppm)	A measure of the amount of dissolved solids in a solution in terms of a ratio between the number of parts of solids to a million parts of total volume; Equivalent to milligram per litre in water or 1ppm=1 mg/l.
Perched Aquifer	A saturated zone with in the zone of aeration that overlies a confining layer; a perched aquifer is above the main water table.
Percolation	The actual movement of subsurface water either horizontally or vertically; ***lateral*** movement of water in the soil subsurface toward nearby surface drainage feature (e.g. stream) or ***vertical*** movement through the soil to groundwater zone.
Permeability	The property or capacity of a soil or rock for transmitting a fluid, usually water; the rate at which a fluid can move through a medium. The definition only considers the properties of the soil or rock, not the fluid. See also hydraulic conductivity.
Pesticides	Chemicals including insecticides, fungicides, and herbicides that are used to kill living organisms.
Physiography	The study of the landforms – form and process.
Piezometer	A type of monitoring well that is open only at the top and bottom of its casing.
Plume	An underground pattern of contaminant concentrations created by the movement of groundwater beneath a contaminant source. Contaminants spread mostly laterally in the direction of groundwater movement. The spill/source site is the highest concentration, and the concentration decreases away from the source.
Point Source Pollution	Pollution from a distinct source, such as industrial discharge pipe, underground storage tank, septic system, or spills.
Polymer	Compound whose matrix is an accumulation of millions of identical, interwoven patterns of molecules.
Porosity	The ratio of the volume of void or air spaces in a rock or sediment to the total volume of the rock or sediment.
Potable	Water that is safe for drinking.
Potentiometric Contour	Elevation at the potentiometric surface.

* Sources: The Penguin Dictionary of Geology, MOE, and Modern Physical Geography, Strahler and Strahler

Glossary of Groundwater Terms*

Potentiometric Surface	An imaginary surface that represents the level to which water rises in wells in a confined aquifer (similar to the water table of an unconfined aquifer).
Precambrian Shield	Rocks formed during the Precambrian era of earth's history, which have become exposed to the surface in what are called shield areas.
Precipitation	Deposition of rain, snow, hail or sleet.
Private Well	A pumping well that serves one home or is maintained by a private owner.
Quaternary Geology	Study of all geologic activity and events, which took place during the Quaternary geologic period (the last 1.8 million years).
Recharge Area	An area in which water infiltrates and moves downward into the zone of saturation of an aquifer; area that replenishes groundwater.
Runoff-Direct	The sum of *surface runoff* and *interflow*.
Runoff-Surface (overland flow)	Precipitation that cannot be absorbed by the soil because the soil is already saturated with water (soil capacity); precipitation that exceeds infiltration; the portion of rain, snow melt, irrigation water, or other water that moves across the land surface and enters a wetland, stream, or other body of water (overland flow). Overland flow usually occurs in urban settings (pavement, roofs, etc.) or where the soils are very fine textured or heavily compacted.
Runoff-Total	Includes the sum of surface runoff (overland flow), baseflow, and interflow (subsurface storm flow) that moves across or through the land and enters a stream or other body of water.
Semi-Permeable	Partially permeable.
Septic System-conventional (private onsite wastewater treatment system [POWTS])	Used to treat household sewage and wastewater by allowing the solids to decompose and settle in a tank, then letting the liquid be siphoned to a drainage or tile field for absorption by the soil.
Specific Conductance	A measure of conductivity of liquids.
Spring	A natural discharge of groundwater at the land's surface.
Static Water Level	The water level in a well that is not being pumped or influenced by pumping.
Stem flow	Water that is intercepted by vegetation and then runs down plant stems or tree trunks to the soil surface.
Stratigraphy	A branch of geology which studies of the formation, composition, sequence, and correlation of the stratified rocks as parts of the earth's crust.
Surface Water	Water found in ponds, lakes, streams, rivers, and inland seas.
Thornthwaite Method	A method to estimate soil water budget, based on air temperature, latitude and date.
Till	Glacier deposits composed primarily of unsorted sand, silt, clay, and

* Sources: The Penguin Dictionary of Geology, MOE, and Modern Physical Geography, Strahler and Strahler

Glossary of Groundwater Terms*

	boulders laid down directly by the melting ice.
Topographic Divide	A high point in the land surface that provides a boundary between adjacent watersheds or basins.
Topography	The contour of the land surface; the configuration of the land surface including its relief and the position of its natural and man-made features
Toxin	A poisonous compound that causes certain diseases or health problems.
Transpiration	The process by which plants take up water through their roots and then give off water vapour through their leaves (open stomata).
Tributaries	Any stream that contributes water to another stream.
Unconfined Aquifer (water table aquifer)	An aquifer with continuous layers of permeable soil and rock that extends from the land surface to the base of the aquifer. The water table forms the upper boundary of the aquifer and is directly affected by atmospheric pressure.
Undercutting	Erosion of material at the foot of a cliff or bank.
Vertical Hydraulic Conductivity	Vertical measure of the ratio of flow velocity to driving force for viscous flow under saturated conditions of a specified liquid in porous medium.
Watershed	The land area from which surface water and groundwater drains into a stream system; the area of land that generates total runoff (surface flow, interflow, and baseflow) for a particular stream system.
Water Cycle (hydrologic cycle)	The continuous circulation of water from the atmosphere to the earth and back to the atmosphere including condensation, precipitation, runoff, groundwater, evaporation, and transpiration.
Water Table	The water surface in an unconfined aquifer; the level below which the pore spaces in the soil or rock are saturated with water; the upper surface of the zone of saturation.
Water Table Contour	A line in a groundwater map that connects points of equal groundwater elevation.
Well	A vertical bore hole in which a pipe-like structure is inserted into the ground in order to discharge (pump) water from an aquifer.
Wellhead	Structure built above a well.
Zone of Aeration (vadose zone or unsaturated zone)	The zone between the land surface and the water table in which the pore spaces between soil and rock particles contain water, air, and/or other gases.
Zone of Saturation (saturated zone)	The zone in which the pore spaces between soil and rock particles are completely filled with water. The water table is the top of the zone of saturation.

* Sources: The Penguin Dictionary of Geology, MOE, and Modern Physical Geography, Strahler and Strahler

EXECUTIVE SUMMARY

Introduction

The Lakehead Region Conservation Authority, in partnership with the Incorporated areas of the City of Thunder Bay; Municipality of Oliver Paipoonge; Municipality of Neebing; Township of Shuniah; Township of Conmee; Township of Dorion; Township of O'Connor; Township of Gillies; and parts of the Unincorporated Areas of Devon, Fraleigh, Lybster, Marks, Adrian, Horne, Dawson Road lots, Forbes, Fowler, Ware, Jacques, Gorham, and Sibley undertook this groundwater management and protection study with partial funding assistance from the Ministry of the Environment (MOE). This is one of a number of groundwater studies that were funded by the MOE in the Province of Ontario in 2003.

R. J. Burnside and Associates Ltd. (Burnside) in partnership with AMEC Earth and Environmental Limited (AMEC) was retained to conduct this groundwater study based on the terms of reference developed for the project and with specific reference to the Technical Terms of Reference (TTOR) for Groundwater Studies developed by the MOE (November 2001). All study components have been completed in accordance with the MOE funding agreement.

The main objectives of the MOE funded groundwater studies were to:

- Obtain a better understanding of the groundwater resources within the study area,
- Complete a hydrogeological characterization and mapping of the area,
- Complete an inventory and assess potential contaminant sources,
- Assess water use in the area,
- Assess groundwater vulnerability, and
- Assist in the development of groundwater protection strategies.

Figure 1.1 presents the study area showing the municipal boundaries and principal features within the area. The study area extends approximately from Whitefish Lake in the west to the head of Black Bay in the east, and from Lake Superior in the south, to Dog Lake in the north.

The study area was defined in consultation with the municipalities within the study area. Figure 1 shows the study area with principal topographic features. The results of the study are briefly summarized in the following sections.

Hydrogeologic Characterization

Surficial deposits within the study area are of Late Wisconsinan age, deposited by the retreating ice margin around 12,500 years ago. A re-advance approximately 11,500 years ago by the Superior Lobe incorporated some lacustrine sediments, deposited between the glacial advances into subsequent till units.

Overall, surficial deposits are thin throughout the area, with local exceptions. North of the Kaministikwia River, all watercourses contain bedrock cuts, indicative of thin cover. The maximum overburden thickness within the study area is near the mouth of the Kaministikwia River, where wells show the combination of glacial deposits and lacustrine sediments to be up to 50 m (160 ft) thick. Moderately thick outwash gravels to the north of the City of Thunder Bay can reach a thickness of 12 m (40 ft), but depths of 3 to 5 m (10 to 16 ft) are more common. Units of glacial till within the study area are relatively thin, usually less than 14 m (46 ft) in thickness.

A number of overburden types occur throughout the area. A large area of till occurs west of the City of Thunder Bay and north of the Kaministikwia River, and is subdivided into stoney sand till, clay till and silt till units. The tills typically contain a significant proportion of fine-grained material.

Additional fine-grained material was deposited in glacial meltwater lakes, ponded behind the Superior ice lobe, and flooded the area to an elevation of at least 260 m (850 ft) above sea level (asl) (75 m above present Lake Superior elevation of 185 m asl). Lacustrine deposits from earlier intervals of glacial retreat occurring at elevations to 366 m (1200 ft) are also noted in logs of water wells northwest of Kakabeka Falls.

Table 1.1 General Stratigraphy in the Thunder Bay Area

Type of Formation	Description	Comments
Overburden	Recent Alluvium	Mainly found along and within the streambeds
	Deltaic and lacustrine plains, beach ridges	Groundwater source possible in lacustrine and beach material
	Intola Moraine and ice-contact deposits	Groundwater source possible in moraine and ice-contact material
	Hazelwood Delta and glaciolacustrine plains	Groundwater source possible in delta and glaciolacustrine material
	Till, and Dog Lake and Mackenzie Moraines	Groundwater source possible in moraine material
	Till, and Brule Creek Moraine	Groundwater source possible in moraine material
	Till and ground moraine	Discontinuous till
Bedrock	Proterozoic age: Intrusive diabase sills and dikes	Sills are cap rock to Nor'Westers, etc.
	Sibley Group sediments	Upper fractured and weathered portions, and open structural zones, may provide limited groundwater source.
	Animikie Group sediments (Rove and Gunflint Formations)	Upper fractured and weathered portions, and open structural zones, may provide limited groundwater source.
	Archean age: metavolcanics and metasediments	Upper fractured and weathered portions, and open structural zones, may provide limited groundwater source.
	Archean Granite	Upper fractured and weathered portions, and open structural zones, may provide limited groundwater source.

Bedrock Geology

Understanding of the bedrock geology is a key component to understanding deeper aquifer distribution and groundwater movement within the study area. The geological description of the bedrock units in the study area is intended to identify regional aquifers for the purpose of assessing the groundwater resource and protection. Information on the bedrock geology was compiled from numerous sources, including: Ontario Geological Survey mapping, geological reports on Paleozoic geology from various authors, a review of well records, etc.

The majority of the study area is underlain by Precambrian rocks as illustrated in Figure 4.1. Bedrock of the Thunder Bay area consists entirely of rocks of Precambrian age, in excess of 2.5 Ga (billion years) in age (Ontario Geological Survey Report GR164, 1977). These rocks have been extensively deformed through metamorphism, with erosional and intrusional contacts further complicating the local geology. In general, the oldest rocks are metavolcanics, overlain by metasediments with this sequence locally intruded by smaller ultramafic and felsic units.

A younger sequence of rocks overlies these, and consists mainly of sedimentary rocks of the Animikie Series, which is comprised of the Gunflint and Rove Formations. These formations are made up of a complex variety of rock types, ranging from cherts to conglomerates, with interbedded argillites and carbonates.

Overburden in the Thunder Bay study area is highly variable in thickness and composition. Thick units of relatively coarse-grained material such as sand and gravel are best for hosting good groundwater aquifers in overburden material. Such areas include glaciolacustrine beach gravels, areas of glaciolacustrine sands, and bedrock depressions filled with thicker units of overburden. The nature of the bedrock underlying an overburden aquifer can also influence the quality and quantity of the water resource. Given the variable nature of the surficial material in the study area, and the variability of the bedrock material itself, delineation of aquifer suitability in terms of water supply potential and water quality, would require site-specific hydrogeological studies.

Regional groundwater flow is generally from the higher elevation areas in the northern part of the study area, southwards, toward Lake Superior. Local groundwater flow parallels surface topography, particularly adjacent to major river valleys. Regional recharge occurs mainly where thick units of coarse sand and gravel are exposed and from bedrock topographic highs. Groundwater recharge occurs through direct infiltration of precipitation, and recharge from surface streams and wetlands.

Groundwater Modelling

The application of a 3-D groundwater model was utilized to delineate municipal well capture zones. The two municipal wells in Rosslyn Village were assessed using the 3-D numerical model known as MODFLOW.

The top and bottom elevations of the overburden and bedrock aquifers were delineated from the detailed cross-sectional analysis of the hydrostratigraphy. Boundary conditions represented in the models include: vertical recharge through the upper layer of the model,

rivers and lakes at the ground surface, etc. Overburden hydraulic conductivity was estimated at each interpreted borehole by assigning local and literature hydraulic conductivity values to the observed lithologies. Pumping wells were assigned to the grid cells nearest to the well location coordinates.

Capture zone delineation was completed using the model parameters outlined above for 50 days, 2 year, 5 year, 10 year, and 25 year time periods.

Water Use and Water Quality

Present water use within the categories of domestic, municipal, public, commercial/industrial and agricultural uses were reviewed in terms of amount and adequacy of water. In order to ensure sustainable growth, the rate of groundwater extraction must be related to groundwater recharge and the maintenance of satisfactory baseflow in local streams. The water use and water budget assessments indicate that there is potential for future groundwater development in the area.

Groundwater quality data for the municipal wells was reviewed. Water quality was determined to be good, with general water quality in most wells being characterized as calcium carbonate and bicarbonate water. Local variations in subsurface stratigraphy and land uses have resulted in mixed waters in some wells. In general, water quality is consistent with that determined in previous years.

Aquifer Vulnerability to Contamination

An aquifer vulnerability assessment was undertaken through the evaluation of intrinsic susceptibility assessment following the TTOR (MOE, November 2001) The potential vulnerability of an aquifer to groundwater contamination is a function of the susceptibility of its recharge area to infiltration. The results of this assessment indicate that the majority of the study area is defined as either moderately or highly vulnerable to groundwater contamination. This is due to the relatively thin to non-existent overburden above the bedrock and the proximity of the water table to ground surface. This combination of physical features tends to make large portions of the study area susceptible to groundwater contamination.

Groundwater Management and Protection Plan

The groundwater management and protection plan developed for the municipal wells in the study area involved a review of the groundwater management strategies that could be adopted by the communities and evaluation of; land use risk rating, identification of protection measures for the recharge area and reviewing various components of a wellhead protection plan. Subsequently, the municipal well capture zones and the intrinsic susceptibility mapping were merged to produce a land use risk rating for the land areas near the municipal wells.

The land use risks have been classified as high for all the area within a 2-year capture zone and moderate to low within the 10 to 25 year capture zones depending upon local intrinsic susceptibility. The existing potential sources of contamination have also been plotted on

these figures. Based on this analysis, the need for assessing and monitoring some of the contaminant source areas has been identified.

The land use risk-rating addresses only the groundwater sources tapped presently by the municipal wells. The capture zone analysis is based on current water takings and is not based on a watershed approach. In order to protect the groundwater resources in the area, the recharge area has to be protected. It should be noted that the intrinsic susceptibility over most of the area was found to be high to moderate, thus, necessitating protection measures.

A brief summary of various options available to each community to develop a groundwater management and protection plan that could be incorporated into their Official Plan is also provided in the report. Examples of some wellhead protection plans developed by various agencies in Canada and USA were also reviewed and copies of the same are included in the report.

As a part of the groundwater management action plan, a groundwater-monitoring program has been proposed. This monitoring program may be given due consideration by the MOE to augment the Provincial Groundwater Monitoring Network.

Emergency response plans and a review of policies and regulations has also been included as part of the groundwater management and protection plan. An implementation plan identifying roles and responsibilities of various municipal departments and other agencies, along with possible funding sources has also been discussed in the report.

Conclusions

The conclusions and recommendations drawn in the study are briefly summarized below:

Based on the detailed hydrogeological characterization, aquifer delineation, municipal well capture zone analysis, aquifer intrinsic susceptibility assessment, contaminant sources inventory, and analysis of land use risk rating, the following conclusions have been drawn:

1. Precambrian metavolcanics and metasedimentary rocks underlie the majority of the area, and are intruded by felsic to mafic rocks of various compositions. The generalized stratigraphy present in the study area consists of seven major overburden types and five bedrock types.

2. The intrinsic susceptibility mapping indicated that most of the area is covered with a thin overburden or exposed bedrock, where the water table is expected to be shallow and the aquifer is susceptible for contamination. The high to moderate sensitivity area also includes the area covered by surficial sand and gravel deposits, which are identified as “recharge areas”.

3. Time related capture zones for the Roslynn Village wells were delineated using a 3-D groundwater modelling techniques and indicate that the principal recharge areas for the wells are as shown on the respective maps.

4. The potential sources of contamination inventory identified a number of potential contaminant sources, mainly concentrated within the City of Thunder Bay core and urbanized areas along major transportation corridors.

5. Land use risk rating analysis identified that the areas within 2-year time of travel (TOT) capture zones are vulnerable and the areas within 10 to 25 year TOT were identified as moderately risky.

6. Given the size of the study area and the population distribution, data gaps are inevitable. This study is the first of its kind in the area and represents an amalgamation of a number of data sources from existing databases. Recommendations are provided in the following section to address this issue.

Recommendations

The following recommendations have been provided:

1. The Rosslyn Village WHPA delineations should be included in the Municipality of Oliver-Paipoonge Official Plan, such that certain land use/activities are restricted within groundwater capture zones as per land use risk rating. Effective land use policies are essential to ensure that future development does not reduce groundwater recharge, deteriorate groundwater quality or deplete groundwater resources.

2. The Municipality of Oliver-Paipoonge should install upgradient groundwater quality monitoring wells for the Rosslyn municipal wellfield. This will permit the municipality to assess groundwater quality of groundwater moving towards the municipal wellfield.

3. A staff member from LRCA should be identified to coordinate and implement future groundwater protection/management programs and initiatives (community awareness and public education, etc.).

4. Due to the number of private wells and septic systems in the study area, the goals and objectives that embody wellhead and groundwater protection must be communicated to the citizens in the study area. Individuals must realize that they have an important role to play in ensuring that their well and septic system is in compliance with all relevant regulations. This can only be accomplished through the delivery of a comprehensive community awareness/education campaign. The LRCA should take the lead to assemble a task force of partners with local representation, and proceed with the implementation of such a program.

5. The groundwater management and protection plan included in this report can serve as a basis for identifying and developing appropriate groundwater protection strategies for each community and/or municipality.

6. Local municipalities and Townships should agree on a process whereby new hydrogeological data (or other relevant information), which becomes available through detailed site investigations (or similar studies) can be incorporated into this

study. Updates/revisions to the mapping should be carried out on a periodic basis. This will allow the information compiled in this study to become a "living document" as new information becomes available. The partner municipalities, LRCA and the MOE need to ensure that there is a clearly defined "guardian" of the data, who is prepared and capable of ensuring that the data are kept up to date.

7. Some suggested approaches and Best Management Practices (BMP) have been included in this report and should be further explored and implemented, particularly in those areas where groundwater is susceptible to surface sources of contamination.

8. A long-term groundwater-monitoring program should be developed in the study area to resolve data gaps noted in this study. The program should be developed in consultation with all area Townships and Municipalities and the LRCA, who are coordinating new monitoring well installations as part of the Provincial Groundwater Monitoring Network. The groundwater-monitoring program should be designed to address:

   - Water quality and quantity concerns in the communities experiencing development pressure (e.g. Kakabeka, Rosslyn Village, Murillo);
   - Water quality concerns in the Slate River Valley; and
   - Potential impacts associated with road salting activities throughout the study area.

9. It should be noted that this groundwater study is completed on a regional scale and local scale hydrogeological and other site assessments will be required for consideration of future development and/or changes in land use activities in any given area.

10. Finally, we recommend that this report be considered as a basis for the development of a comprehensive groundwater source protection plan and for future planning initiatives for the collective study area.

1.0 Introduction

1.1 General

The Lakehead Region Conservation Authority, in partnership with the Incorporated areas of the City of Thunder Bay; Municipality of Oliver Paipoonge; Municipality of Neebing; Township of Shuniah; Township of Conmee; Township of Dorion; Township of O'Connor; Township of Gillies; and parts of the Unincorporated Areas of Devon, Fraleigh, Lybster, Marks, Adrian, Horne, Dawson Road lots, Forbes, Fowler, Ware, Jacques, Gorham, and Sibley undertook this groundwater management and protection study with partial funding assistance from the Ministry of the Environment (MOE). This is one of a number of groundwater studies that were funded by the MOE in the Province of Ontario in 2003. R. J. Burnside & Associates Ltd. (Burnside) in partnership with AMEC Earth and Environmental Limited (AMEC) were retained to conduct this groundwater study based on the terms of reference developed for the project and with specific reference to the Technical Terms of Reference (TTOR) for Groundwater Studies developed by the MOE (November 2001). All study components have been completed in accordance with the MOE funding agreement.

The main objectives of the MOE funded groundwater studies were to:

- Obtain a better understanding of the groundwater resources within the study area;
- Complete hydrogeological characterization and mapping of the area;
- Complete an inventory and assess potential contaminant sources;
- Assess water use in the area;
- Assess groundwater vulnerability, and
- Assist in the development of groundwater protection strategies.

Figure 1.1 presents the study area showing the municipal boundaries and principal features within the area. The study area extends approximately from Whitefish Lake in the west to the head of Black Bay in the east, and from Lake Superior in the south to Dog Lake in the north. A detailed description of the study area features is provided in Section 2.

The actual work plan and approach to this groundwater study were designed to address issues that have been identified by various partners (stakeholders) in the study while at the same time adhering to the TTOR (MOE, November 2001). One of the basic expectations of the MOE TTOR is the development of a consistent groundwater resource database, including water wells, geological and hydrogeological information and potential contaminant sources. The main purpose of this study was to assist in the development of a groundwater source protection strategy to help ensure that water supply is sustainable and the natural environment is protected. A brief description of the objectives and scope of the work and an overview of the report is included in the following sections.

1.2 Objectives and Scope

The objectives of the present study are two fold: one is the identification of areas of concern including an inventory of wells and fuel tanks, and the second is the assessment of the potential for contamination and groundwater vulnerability, on which to provide inputs for the development of a groundwater management and protection plan and its implementation. These study objectives can be grouped into the following three principal components:

A. Hydrogeological Characterization, which includes:

- Data collection and review;
- Establishing a comprehensive hydrogeological database;
- Preparing various geological and hydrogeological maps;
- Delineation and characterization of various aquifers;
- Assessing groundwater quality; and
- Developing numerical groundwater modelling tools for groundwater management and protection.

B. Groundwater Vulnerability Assessment, which includes:

- Potential contaminant sources inventory and assessment;
- Aquifer vulnerability mapping;
- Review of land use plan; and
- Identifying potential areas of risk.

C. Development of Groundwater Management and Protection Plan, which includes:

- Review of the land use plan in light of the potential contaminant sources and the aquifer vulnerability;
- Review of strategies for the management and protection of the groundwater sources;
- Developing policies for well maintenance and abandonment;
- Developing emergency plans and related policies;
- Developing a groundwater monitoring program; and
- Reviewing an implementation plan.

Overall, the study will assist local agencies to develop a framework including protection plans to minimize impacts to the groundwater.

1.3 Report Outline

This report is presented in two volumes. The text is provided as Volume 1 and the Figures and Appendices are included in Volume 2. The main body of the report provides brief descriptions of the results and summarizes the findings. The figures that are referred in the main body of the text are included in Volume 2. Supporting information

related to the information presented in the main body of the report is included in Appendices A to J.

The main report is divided into several sections, each section detailing a particular component of the study. The sections are as follows:

Section 1 Introduction;
Section 2 Study area description, including the topography and drainage;
Section 3 Methodology and approaches taken in data collection and analysis;
Section 4 Presentation of results of the hydrogeological characterization, which includes detailed discussions on the geology and groundwater conditions of the study area;
Section 5 Groundwater modelling results are summarized in Section 5;
Section 6 Surface water assessment;
Section 7 Water quality and use assessments;
Section 8 Potential contaminant sources assessment;
Section 9 Presentation of groundwater vulnerability assessment;
Section 10 Review of some possible groundwater management strategies that are available to the municipality to assist in future planning to protect the groundwater resources in the study area;
Section 11 Discussion of Wellhead Protection Area (WHPA) delineation and management plans;
Section 12 Discussion of implementation of the management plan and roles and responsibilities of various departments/agencies and the public;
Section 13 Conclusions;
Section 14 Recommendations; and
Section 15 Bibliography.

2.0 Study Area Description

The study area, as described in the previous section includes the jurisdiction of the Lakehead Region Conservation Authority, plus some additional area to the north and west, and includes approximately 99% of the population of the region. A description of principal physical features and general information pertaining to the population and land use activities is provided in this section.

2.1 Topography and Drainage

Figure 2.1 presents the general topography and ground surface elevation across the study area. The northern and western portions of the project area generally consist of higher elevations (areas shown in red, brown and yellow). Lower lying areas predominantly occur along the Kaministiquia River below Kakabeka Falls, in the vicinity of Thunder Bay, and in the northern portion of the Sibley Peninsula along the western shore of Black Bay. The elevated areas are directly underlain by Precambrian rocks of various types and formations, while the low lying areas are typically underlain by thicker sequences of surficial or glacial material, particularly in the Kaministiquia River valley. Ground

surface elevations in the study area range from approximately 625 metres above mean sea level (m masl) to the north, to 183 m amsl at Lake Superior.

Watercourses in the northern portion of the study area appear to reflect some of the major structural features in the underlying bedrock terrain, and drain toward Lake Superior. Figure 2.2 illustrates subwatershed boundaries within the study area. All subwatersheds within the study area drain southward, and typically, drain areas within both the bedrock dominated northern portion as well as the lowlands adjacent to Lake Superior. A detailed assessment of the surface water characteristics is presented in Section 6 of this report.

2.2 Physiography

The Severn Upland, a physiographic subdivision of the James Region of the Precambrian shield makes up the northern portion of the study area (OGS Report GR 164). This area is dominated by the rolling surface of the Precambrian bedrock that is exposed at surface or only shallowly covered over much of the area. The southern boundary of this subdivision extends from Whitefish Lake in the west, through Kakabeka Falls, and extending east sub parallel to the shore of Thunder Bay itself. South of this line are the Port Arthur Hills, with the core of these consisting of The Nor'Westers and Mount McKay. In general, these hills consist of southward dipping Proterzoic sills and underlying metasediments. The City of Thunder Bay is located predominantly in an area dominated by the surficial material associated with the Kaministiquia River valley, immediately east of the Nor'Westers. A more detailed description of the surficial formations is provided in Section 4.

2.3 Climate

Thunder Bay's climate is characterized by extremes in temperature, low humidity and moderate winds, characteristic of a mid-latitude inland location. The influence of Lake Superior on the local climate is restricted to a zone approximately 16 km inland from the shoreline, as the prevailing winds in the area are westerly (off shore). The lake has a slight warming effect in the winter and slight cooling effect in the summer. Average annual precipitation throughout the district ranges from 696 mm to 823 mm (Ontario Ministry of Natural Resources, 1982. Thunder Bay District Land Use Plan, Background Information) with 70% being in the form of rain. Daily mean temperatures range from a low of -18.7^0 C in January to a high of 18.5^0 C in July, with an average annual temperature of 2.6^0C (Environment Canada).

Two weather stations are present within the study area at Thunder Bay and Kakabeka Falls. Although only 29 km apart, a comparison of temperature data from the stations illustrates the moderating effect of Lake Superior. Minimum temperatures in Thunder Bay are about 3^0C warmer on an annual basis than at Kakabeka Falls. In addition, the inland areas receive most of their snow in November, while the City receives most of its snow in January (Lakehead Region Conservation Authority, 1982).

Based on the surface water assessment completed in this study, the annual water budget indicates an annual surplus of 197 mm.

2.4 Historical Development and Growth

The use of the Kaministiquia River fur-trading route for travel to the west led to the founding of Fort William in 1801 as the headquarters of the North West Company. "The Station" was developed at the mouth of the Kaministiquia River to serve as a base for expeditions, and the official westward route known as the Dawson Trail (Ontario Ministry of Natural Resources, 1982. Thunder Bay District Land Use Plan, Background Information). This Trail was established in 1857 as the main route from Lake Superior to Winnipeg.

The Canadian Pacific Railway began in Fort William as the start of the rail link to Winnipeg, in 1875. The railway lead to rapid expansion in the area, including developments in mining, lumbering and agriculture, and resulting in Fort William and Port Arthur being developed. These were amalgamated into Thunder Bay in 1970. Highway 11 West was opened in 1931, and the Trans-Canada to Winnipeg in 1935, with the Trans-Canada around the north shore of Lake Superior completed in 1960. The first airport was begun in 1927, and was known as Bishop Field.

Hydroelectricity was generated at 3 sites in 1982 (Ontario Ministry of Natural Resources, 1982. Thunder Bay District Land Use Plan, Background Information). These include the:

- Current River generating station (built in 1901 and operated until 1970. Privately run from 1985 to present);
- Kakabeka Falls generating station (built in 1906); and
- Silver Falls generating station, between Kakabeka Falls and Dog Lake.

There is also a thermal electric generating station on Mission Island, built in 1968.

Gravel extraction activities have also been conducted throughout the development of the City. The majority of these were small operations, occurring whenever sufficient gravel resources were located. Production was approximately 2.8 million tonnes in 1976 (Lakehead Region Conservation Authority, 1982) dependent on the level of construction activity.

In addition to quarry operations, lumbering has been a major industry of the Thunder Bay area since settlement of the area began. The industry began in 1868, when the first sawmill was established at the mouth of McVicar's Creek. The Port Arthur Pulp and Paper (later Provincial Paper) Company began operations in 1918, with operations eventually taken over by Abitibi-Price Inc. (now Abitibi Consolidated Inc.). Mills producing kraft pulp, studs, and wafer board/particle board were also established in Thunder Bay, along with a wood treatment plant (Northern Wood Preservers), as the City is a major transfer point of logs for regional mills (Ontario Ministry of Natural

Resources, 1982. Thunder Bay District Land Use Plan, Background Information). In addition, Kakabeka Timber Ltd. operated a mill in Kakabeka Falls. An Ontario Ministry of Natural Resources report in 1982 (Thunder Bay District Land Use Plan, Background Information) stated that there were 4 mills (paper, kraft and lumber) and 17-grain elevators in the area at that time.

Historical population information, compiled from a number of sources, for the City and surrounding area is presented in Table 2.1 below:

Table 2.1 Historical Population

Year	Population (reference)
1881 (City only)	1,965 (4)
1901	11,200 (2)
1921 (metro)	39,650 (4)
1931 (metro)	52,000 (4)
1941 (metro)	63,286 (4)
1951	105,400 (2)
1961	102,600 (4)
1971	108,411 (3)
(City and incorporated municipalities)	115,514 (3)
(Unorganized area)	2,909 (3)
1976	111,476 (3)
(City and incorporated municipalities)	120,203 (3)
(Unorganized area)	3,927 (3)
1980 (enumeration)	111,949 (1)
1981	121,379 (4)
1991	124,427 (4)
2001	121,986 (4)

(1) Ontario Ministry of Natural Resources, 1982. Thunder Bay District Land Use Plan, Background Information.

(2) Lakehead Region Conservation Authority, 1982; page C-1.

(3) Lakehead Region Conservation Authority, 1982; page K-2.

(4) Development Thunder Bay population data: page C-1 and graph Metro: City of Thunder Bay, Townships of Neebing, O'Connor, Oliver, Paipoonge, Shuniah and Fort William Indian Reserve No. 52.

A brief discussion on the current land use and its implications on the groundwater usage are presented in Section 10, as part of the Official Plan review.

3.0 Methodology

An integrated approach involving the application of various tools and techniques was adopted in this groundwater management study. The methodologies applied in data collection, data review, data assessment, interpretation, and mapping in each of the components of the study are discussed briefly in this section. In general, the approach to mapping and analysis described in the TTOR (MOE, November 2001) [Appendix A] was

followed to a large extent. In some cases, slight modifications to the proposed approach have been adopted in order to enhance the accuracy and improve the presentation of data and maps.

3.1 Data Collection and Background Review

Geological, hydrogeological and water resources data was collected from various sources including:

- Ministry of the Environment (MOE);
- Ministry of Natural Resources (MNR);
- Ministry of Northern Development and Mines (MNDM);
- Lakehead Region Conservation Authority (LRCA);
- City of Thunder Bay staff (numerous departments);
- Thunder Bay District Health Unit; and
- Staff from other Municipalities associated with the study.

MOE provided water well records database in electronic format for those of which have been entered into the database. Paper copies of water well records associated with lot severances within the City were obtained from the City of Thunder Bay, with the associated water chemistry and pumping test data incorporated into the overall database. The water well record database provided the principal basis for most of the hydrogeological analysis completed in the present groundwater management study.

Hydrogeological reports for various site investigations including subdivision development, municipal test well drilling and other environmental studies were also obtained from the City archives. A hydrogeological reports database in MS ACCESS format was developed and all the pertinent information for the assessment of the groundwater resources has been entered into this database. The hydrogeological database facilitates data entry and retrieval of required information through data queries. This database includes a list of available hydrogeological reports. A list of these reports is included in the Bibliography (Section 14).

Data related to contaminated sources was collected from the MOE, Technical Standards and Safety Authority (TSSA) and Insurer's Advisory Organization (IAO). The following data related to potential contaminant sources within the study area were collected and analyzed from:

- MOE contaminated sites files;
- Waste generator database - database of all the hazardous waste generators, carriers and receivers registered in Ontario;
- Polychlorinated Biphenyls (PCB) Storage Sites;
- Waste Disposal Sites;
- Organic Soil Conditioning Sites where municipal sewage treatment plant sludge is applied to soil in agricultural areas;
- Septage Sites;

- Sites where a spill or a release of contaminants has occurred; and
- Sites where complaints have been launched by adjacent landowners.

A number of previous reports related to watershed studies, flood plain mapping and related information was also collected from the Lakehead Region Conservation Authority.

MNDM provided most of the mapping information, including a DEM (Digital Elevation Model), Ontario Base Mapping (OBM) in 1:20,000 scale, and bedrock geology and quaternary geology mapping for the entire study area including a 5 km buffer as images. Lot fabric mapping was also obtained from the City of Thunder Bay.

Climate data, including average monthly temperature and precipitation, were obtained through the *"Canadian Climate Normals"* and *"Temperature and Precipitation"* produced by Environment Canada. The climate normals for climate stations within and near the study area were used in calculations of the average annual water balance.

All available pertinent information was reviewed early in the project and background maps were prepared to facilitate data verification. This background review provided a good understanding of the hydrogeological setting and in identifying various issues related to groundwater management. As such, the investigations and analysis completed in the present study were aimed at an improved characterization of the hydrogeologic system(s) and developing groundwater management plans.

3.2 Database Management Systems

The MOE provided the water well records data in MS ACCESS database format. The TTOR (MOE, November 2001) describes data verification and screening techniques and standardized methods for hydrogeological analysis and mapping. In this study, these procedures were followed to the extent possible and minor modifications and improvements were made where necessary because of site-specific conditions or sparse data or a combination of other factors.

As the MOE water well records database formed the principal data input to a large number of hydrogeological maps and the analysis completed in this study, extensive data verification and screening of this data was completed to improve confidence in the mapping and analysis. The data verification steps proposed in the TTOR (MOE, November 2001) has been adapted to a large extent in the present analysis. Figure 3.1 presents the reliability codes for the MOE water well records database using the reliability codes defined in the database. As can be seen from this figure, 0 % of a total 3297 well records could be classified as having high reliability with respect to their location coordinates and surface elevation, and a large number (66.2 %) of the wells were grouped as having medium reliability and 33.8 % of the wells had low or unknown reliability. For the purpose of the present analysis, all wells with a MOE reliability code of 6 and less (which includes both medium and high reliability classes) were used.

All other data collected in this study has also been entered into the MS ACCESS database in a format that can be easily retrieved through queries. Most of the point data within the Access database is linked to ArcView for creating maps giving the resultant maps full GIS capability. The hydrogeological database will be extremely useful for planning and management of the groundwater resources in the municipality.

ArcView software in combination with VIEWLOG software were used to plot a number of hydrogeological maps based on the collected data and field investigations/observations completed in this study. Specific queries and tables and forms were developed to complete a multi-variant analysis.

3.3 Field Investigations

Field investigations included ground-truthing of potential contaminant source areas databases received from the MOE, Technical Standards and Safety Authority (TSSA), and Insurer's Advisory Organization (IAO). Table 3.1 provides a summary of the purpose and tasks completed in these field investigations.

Table 3.1 Summary of Field Investigations

Field Activity	Purpose	Summary Comments
Site Visits	• To better understand geology and groundwater conditions • Inspect municipal wells and monitoring wells • Locate aggregate extraction and waste disposal sites	• Principal geological and structural features were identified in the field and their role on the general surface drainage and subsurface geology were interpreted. • Municipal wells and the existing monitoring wells were inspected to assess their present status and determine maintenance requirements of those installations. • Aggregate extraction sites were visited to understand the overburden stratigraphy within the "recharge area". • The landfill site visit helped understand the potential for surface water and groundwater impacts from the site.
Ground-Truthing	• Accurately locate potential contaminant sources listed in MOE, TSSA, and IAO databases	• A number of known contaminant sources, which were identified by City and PUC services staff were visited to check local hydrogeology. • All potential contaminant sources indicated by various agencies were field checked for location and assess their present status and nature of the contained contaminant materials.

3.4 Project Review/Inputs

3.4.1 Technical Advisory Committee

A Technical Advisory Committee (TAC) was formed to oversee the progress of the study and to provide suggestions and input as required. The TAC committee was comprised of members from: the Lakehead Region Conservation Authority; the City of Thunder Bay Planning and Building Dept, Engineering Dept, and engineering and Operations; Thunder Bay District Health Unit; Ministry of Municipal Affairs and Housing; Ministry of the Environment; Ministry of Natural Resources; Lakehead Rural Planning Board; Ministry of Northern Development and Mines; Ontario Ministry of Agriculture; and Burnside and AMEC Project Managers, as well as key team members as required.

The TAC committee met three times during the project. The first meeting was held on June 23, 2003, soon after the award of the contract in May 2003. At this meeting, Burnside presented a work plan and discussed the approach. The project team indicated that no data from the MOE or other sources had been received.

The second TAC meeting was held on Dec 3, 2003 to update the members of the progress of the study and to seek inputs to the study. The project approach and results of preliminary maps and analysis were presented to the committee. It was indicated that there were delays in receiving most of the data from the MOE, resulting in delays to the overall project schedule.

The third TAC committee meeting was held on March 24, 2005 and all geological and hydrogeological mapping that have been completed were presented. It was observed by the members that the project progress was good and the results satisfactory. Feedback was provided on the draft report.

3.4.2 Public Open Houses

Two Public Open houses were scheduled during the project, one midway through the project to present preliminary results (December 3, 2003) and the other to present the results of the draft report (May 26, 2005). Notification of the public open house(s) were made through news releases and public notices. Copies of the news releases are included in Appendix C.

During these events, a model was available to illustrate groundwater flow and the migration of contaminants through the subsurface. Videos illustrating basic groundwater flow principles and well construction and maintenance were also available. Brochures were available to the public regarding topics such as wellhead protection and maintenance, septic system maintenance and water conservation.

In the first public open house, the project team presented preliminary results of the study and sought input from the public. A number of steering committee members including a representative from the MOE were also available to answer questions from public. The

open house was well attended and most attendees felt that the event was educative and useful. The participants included members of the general public, representatives from various departments of the City, interested members from various government agencies. A list of the attendees at this first open house is included in Appendix C.

In the second open house, the project team presented the results of the report to the public. The second open house had fewer attendees, however, those that attended felt that the event was informative and useful. A list of the attendees at the second open house is included in Appendix C.

4.0 Hydrogeological Characterization

The geology and the hydrogeological conditions in the study area are discussed in this section. The geological setting of the study area is presented along with a brief description of the implications of the geology on the groundwater conditions. Delineation of aquifers and an analysis of the groundwater flow system(s) are discussed in detail through the presentation of a number of hydrogeological maps. The hydrogeological concepts derived from this analysis are used as inputs to a three dimensional groundwater model simulation presented in Section 5.

4.1 Surficial Geology

Surficial deposits within the study area are of Late Wisconsinan age, deposited by the retreating ice margin around 12,500 years ago. A re-advance approximately 11,500 years ago by the Superior Lobe incorporated some lacustrine sediments, deposited between the glacial advances into subsequent till units.

Overall, surficial deposits are thin throughout the area, with local exceptions. North of the Kaministiquia River, all watercourses contain bedrock cuts, indicative of thin cover. The maximum overburden thickness within the study area is near the mouth of the Kaministiquia River, where wells show the combination of glacial deposits and lacustrine sediments to be up to 50 m (160 ft) thick. Moderately thick outwash gravels to the north of the City of Thunder Bay can reach a thickness of 12 m (40 ft), but depths of 3 to 5 m (10 to 16 ft) are more common. Units of glacial till within the study area are relatively thin, usually less than 14 m (46 ft) in thickness.

A number of overburden types occur throughout the area. A large area of till occurs west of the City of Thunder Bay and north of the Kaministiquia River, and is subdivided into stoney sand till, clay till and silt till units. These typically contain a significant proportion of fine-grained material. Additional fine-grained material was deposited in glacial meltwater lakes, ponded behind the Superior ice lobe that flooded the area to an elevation of at least 260 m (850 ft) asl (75 m above present Lake Superior elevation of 185 m asl). Lacustrine deposits from earlier intervals of glacial retreat occurring at elevations to 366 m (1200 ft) are also noted in logs of water wells northwest of Kakabeka Falls.

A major surface feature within the study area is the Kaministiquia River delta, which extends for approximately 20 km from the shore of Lake Superior to Kakabeka Falls. It is divided into two distinct physiographic units, the deltaic upland and the lower deltaic plain. The deltaic upland extends from Rosslyn approximately 15 km upstream to Kakabeka Falls, encompassing an elevation rise from 230 m (750 ft) asl to 260 m (850 ft). A wave-cut bluff forms the eastern face of this upland feature, and gravel and sand form the core of the upland. Between the upland and Lake Superior is the lower deltaic plain, which is more extensive than the deltaic upland, being 24 km long and varying from 6.5 km to 21 km wide. Surface elevations within the deltaic plain drop only 43 m (141 ft) across this length, with no major topographic breaks in the general slope. Underlying this plain at the north end of McKellar Island is a bedrock high, with elevations to 650 feet asl on the bedrock surface (Ontario Geological Survey Report GR164, 1977; Figure 8). Ontario Geological Survey Map 2372 also illustrates glaciofluvial and deltaic sediments bordering on each side of the Kaministiquia River approximately 10 km from the Lake Superior shore, with finer grained lacustrine deposits extending up the valley to Rosslyn. This sequence is bordered on the south by the bedrock uplands of the Nor'Westers and on the north by older tills deposited by the Superior ice lobe.

Locally, there are extensive but typically thin deposits of outwash sand that have been reworked by the action of glacial lakes. Evidence of this reworking is visible up to elevations 56 m (184 ft) above the present level of Lake Superior. Additional discontinuous glaciofluvial deposits are located north of the Kaministiquia River, adjacent to the present Lake Superior shoreline (Ontario Geological Survey Map 2372). A large number of sand and gravel extractive operations are associated with the sediments located between Rosslyn and Kakabeka Falls, as well as with the discontinuous glaciofluvial deposits north of the City. In addition, a unit of fine to medium sand also occurs on the eastern side of the Sibley Peninsula.

Three major moraines occur in the north-central portion of the study area, as illustrated by Ontario Geological Survey Map 2203. The Dog Lake Moraine was established by a readvance of the Dog Lake ice lobe from the northeast following the late-Wisconsinan glaciation. This moraine consists of a stony loam till, and extends in a NW-SE orientation from the southern shore of Dog Lake. The Dog Lake Moraine extends to the SE until it intersects the Mackenzie and Marks Moraines at the present location of the Current River. Marks Moraine consists of silt and clay till, and was established by the westerly readvance of the Superior ice lobe at the same time as the Dog Lake Moraine. Glacial Lake Kaministiquia was dammed in the angle of the Superior and Dog Lake ice lobes. The Mackenzie Interlobate Moraine was also formed between the Superior and Dog Lake ice lobes prior to 10,200 years BP. Useable gravel and sand deposits reportedly occur within the ice-contact deposits and the interlobate deposits of the Marks Moraine.

Modern alluvial deposits, with a composition controlled by the underlying glacial material, are found in the local streambeds throughout the study area.

4.1.1 Overburden Thickness

The overburden thickness map presented in Figure 4.4 is prepared by subtracting the bedrock surface elevation (Figure 4.2) from the DEM (or the ground surface elevation, presented in Figure 2.1). The resulting figure shows the thickest overburden typically occurs within the bedrock valleys, with up to 40 m of overburden at the mouth of the Kaministiquia River, and 20 to 25 m underlying both the Whitefish River and Slate River valleys. Isolated areas of thicker (15 to 20 m) overburden also occur at Cloud Bay, Jarvis River, and Shabaqua Corners. Another area of thick overburden is located in the area of Dorion, and reaches depths of more than 30 m over a small area. A mantle of thin overburden typically covers the remainder of the study area, typically ranging from 0 to 10 m locally.

4.1.2 Sand and Gravel Occurrences

Figure 4.5 illustrates the areas of sand and gravel occurrences within the immediate area of Thunder Bay. This map can be used to outline areas of potentially thicker permeable material, identifying areas of potential aquifers within overburden material. The map does not differentiate between sands and gravels above the water table vs. saturated material below the water table, and so will over-estimate potential aquifer thickness.

Much of the area illustrated in Figure 4.4 contains no mappable sand or gravel occurrences, and is dominated by areas having drift cover less than 5 m thick, as shown by the overburden thickness map. The majority of the overburden units containing notable sand and gravel material occur along the Kaministiquia River valley, or are associated with the northeast-southwest trending Dog Lake Moraine. The Kaministiquia River valley hosts most of the outwash sand and gravel material, with the moraine area being mainly deltaic or stratified drift deposits, each reflecting the glacial history of the local material. Aggregate extraction operations (historical and current) are mainly located in the Dog Lake Moraine deposits, along the Kaministiquia River and in an area of shore sands immediately north of the Neebing River. The remainder of the study area contains isolated occurrences of sand and gravel deposits and/or extractive operations.

4.1.3 Bedrock Geology

Understanding of the bedrock geology is a key component to understanding deeper aquifer distribution and groundwater movement within the study area. The geological description of the bedrock units in the Thunder Bay area is intended to identify regional aquifers, for the purpose of assessing the groundwater resource. Information on the bedrock geology is compiled from numerous sources, including: Ontario Geological Survey mapping, geological reports on Paleozoic geology from various authors, a review of well records, etc.

Table 4.1 General Stratigraphy in the Thunder Bay Area

Type of Formation	Description	Comments
Overburden	Recent Alluvium	Mainly found along and within the streambeds
	Deltaic and lacustrine plains, beach ridges	Groundwater source possible in lacustrine and beach material
	Intola Moraine and ice-contact deposits	Groundwater source possible in moraine and ice-contact material
	Hazelwood Delta and glaciolacustrine plains	Groundwater source possible in delta and glaciolacustrine material
	Till, and Dog Lake and Mackenzie Moraines	Groundwater source possible in moraine material
	Till, and Brule Creek Moraine	Groundwater source possible in moraine material
	Till and ground moraine	Discontinuous till
Bedrock	Proterozoic age: Intrusive diabase sills and dikes	Sills are cap rock to Nor'Westers, etc.
	Sibley Group sediments	Upper fractured and weathered portions, and open structural zones, may provide limited groundwater source.
	Animikie Group sediments (Rove and Gunflint Formations)	Upper fractured and weathered portions, and open structural zones, may provide limited groundwater source.
	Archean age: metavolcanics and metasediments	Upper fractured and weathered portions, and open structural zones, may provide limited groundwater source.
	Archean Granite	Upper fractured and weathered portions, and open structural zones, may provide limited groundwater source.

The majority of the study area is underlain by Precambrian rocks as illustrated in Figure 4.1. Bedrock in the Thunder Bay area consists entirely of rocks in excess of 2.5 Ga (billion years) in age (Ontario Geological Survey Report GR164, 1977). These rocks have been extensively deformed through metamorphism, with erosional and intrusional contacts further complicating the local geology. In general, the oldest rocks are metavolcanics, overlain by metasediments with this sequence locally intruded by smaller ultramafic and felsic units.

A younger sequence of rocks overlies these, and consists mainly of sedimentary rocks of the Animikie Series, which is comprised of the Gunflint and Rove Formations. These formations are made up of a complex variety of rock types, ranging from cherts to conglomerates, with interbedded argillites and carbonates.

The youngest of the Precambrian rocks in the Thunder Bay area are the Logan Sills, which were emplaced approximately 1.1 Ga ago. These sills are essentially sheets of diabase rock up to 60 m thick (Ontario Geological Survey Report GR164, 1977). They form the cap of the highest hills in the area, the Nor'Westers, which are located immediately south of the City of Thunder Bay.

Detailed bedrock geology is illustrated in government geological maps (Geological Compilation Series Map 2065 and 2232). The maps show the southwestern part of the study area being underlain by diabase (preserved on the topographic highs) with fine-grained sediments of the Rove Formation in the valleys. North of this is the Gunflint Formation, running in a band from Whitefish Lake through Kakabeka Falls to Highway 800. Further north are bands of Archean volcanics (extending as far north as Kaministiquia) and sediments, oriented approximately east west across the study area. Finally, massive granite rocks underlie the northern part of the study area. An exception to this sequence of rocks is the Sibley Peninsula, which is largely underlain by sedimentary rocks of the Sibley Group, with minor areas of Rove Formation and diabase cap rock on the southern tip of the peninsula.

4.1.4 Bedrock Surface Elevation

The purpose of the bedrock surface elevation mapping is twofold:

- To identify bedrock valleys in which thicker permeable overburden deposits may host potential water supply aquifers; and
- To define bedrock highs and lows which could control groundwater occurrence and movement.

Bedrock surface elevation data is presented in Figure 4.2. In general, the bedrock topography closely reflects the ground surface elevations illustrated in Figure 2.1.

The highest bedrock surface elevations correspond to areas having thin covers of surficial material overlying the Precambrian bedrock. These correspond to the northern and western parts of the study area, and the area around the Nor'Westers. Bedrock elevations to approximately 550 m amsl (identified by red shaded area) occur in the area north of Whitefish Lake, with the elevations dropping generally toward Lake Superior. A comparison of the bedrock surface elevation (Figure 4.2) and the ground surface elevation (Figure 2.1) confirms that there is very little overburden over areas dominated by Precambrian granitic rocks.

The lowest bedrock elevation within the study area underlies the Kaministiquia River valley and the City of Thunder Bay, where the bedrock surface lays approximately 150 m amsl. This elevation is approximately 30 m below the elevation of Lake Superior. Two bedrock valleys trend westward from the Kaministiquia bedrock valley, and underlie the Whitefish and Slate River valleys to the north and south respectively. In addition, bedrock valleys underlie Hawkeye Lake and the area to the east, the Current River valley

and the Greenwich Lake – Mackenzie River valleys, indicating likely structural bedrock control for the location of these surface drainage features.

4.2 Geologic Cross Sections

Six geological cross sections have been prepared to obtain perspective of the subsurface geology across the Thunder Bay groundwater study area. The location of the cross sections is shown in Figure 4.6, and individual cross sections are included as Figures 4.7-4.12 inclusive. The cross sections present details of the interpreted Quaternary and bedrock geology, water table elevation, topography, and interpreted bedrock surface elevation in the area. The updated MOE water well record database was used to prepare the geologic cross sections.

4.3 Hydrogeologic Mapping and Analysis

4.3.1 Groundwater Occurrence in the Area

Groundwater is defined as the water occurring within the saturated portion of the subsurface, and the upper surface of this saturated zone is the water table. Groundwater is under "unconfined conditions" when the water table is in direct contact with the atmosphere, through the pore spaces within the unsaturated portion of the subsoil. When the saturated formation is overlain by an impermeable formation or aquitard, the groundwater is under "confined conditions". If the overlying formation is semi-permeable permitting limited movement of water across the aquitard, the groundwater is under "semi-confined" conditions.

The rate of groundwater flow through the subsurface depends on the permeability of the formation and the hydraulic gradient across the formation. The direction of groundwater flow depends on the extent, continuity and permeability of the aquifers. Hydrogeologically, two completely different materials can behave in the same way if their permeability is same. For example, highly weathered bedrock and the overlying sand layer could behave as one waterbearing formation as long as their permeabilities are similar. The bedrock and the overburden aquifer characteristics are discussed in the following sections.

Overburden in the Thunder Bay study area is highly variable in thickness and composition. Thick units of relatively coarse-grained material such as sand and gravel are best for hosting good groundwater aquifers in overburden material. Such areas include glaciolacustrine beach gravels, areas of glaciolacustrine sands, and bedrock depressions filled with thicker units of overburden. The nature of the bedrock underlying an overburden aquifer can also influence the quality and quantity of the water resource. Given the variable nature of the surficial material in the study area and the variability of the bedrock material itself, delineation of aquifer suitability in terms of water supply potential and water quality, would require site-specific hydrogeological studies.

Regional groundwater flow is generally from the higher elevation areas in the northern part of the study area toward Lake Superior. Local groundwater flow parallels surface topography, particularly adjacent to major river valleys. Regional recharge occurs mainly where thick units of coarse sand and gravel are exposed, and from bedrock topographic highs. Groundwater recharge occurs through direct infiltration of precipitation, and recharge from surface streams and wetlands.

4.3.2 History of Groundwater Development in the Area

Residential Well Development

The history of groundwater exploration and development in Thunder Bay is closely connected to the development of municipal water supply system(s). Prior to and in the early years of the construction of the municipal water supply system, most residents of the area would have depended on individual domestic wells. In order to review the history of the water well development, a statistical analysis on the MOE water well records database was performed to assess the growth of wells in the study area. Figure B-2 in Appendix B presents the results. Based on available data, the period 1975-1980 represents the period of most intense growth of wells. This is likely a result of a residential housing boom that occurred over this period.

Based on the MOE water well record database, 91 percent of the wells in the study area are domestic wells. The remaining portions are: Stock (2%), Industrial (1%), Commercial (2%) and Not Used (2%). Well yields are variable with approximately 58% of the wells in the 0-5 Igpm (Imperial Gallons per minute) range, 27% in the 5-10 Igpm range and 9% in the 10-15 Igpm range. Only 5% of the wells have higher yields. Well completion depths are highly variable with 75% of the wells completed at depths of 60 m or less. As shown in Figure B 2 in Appendix B, overburden wells dominate the study area and the greatest number of wells drilled on record occurred in the 1975-1980 period. The results of the statistical analysis are included in Appendix B.

4.3.3 Thunder Bay Municipal Water Supply and Water Treatment Plants

The City of Thunder Bay is supplied by two water sources. The Loch Lomond water supply is located south of the City limits, on Mount McKay Lookout. The water intake extends 220 m into the lake, and supplies water by gravity distribution through the City's system. A microfiltration system built in 1998 has an operational capacity of 28 million L/d (6.25 million Igpd). The plant's objective is to remove microscopic particulate material, and uses membrane technology ultra filtration, sodium silicate treatment for corrosion control and chlorine disinfection. Lock Lomond supplies the portion of Thunder Bay South located south of the Neebing River.

The Bare Point water treatment plant is located in the northern part of the City. The water supply is Lake Superior, with the intake pipe located approximately 1 km offshore from Bare Point. It has an operational capacity of 64 million L/d (14 million Igpd), and serves the population of Thunder Bay North (formerly Port Arthur), and the portion of

Thunder Bay South (formerly Fort William) north of the Neebing River. Water treatment at the plant utilizes pre-chlorination, coagulation-flocculation with alum and polymer, followed by anthracite-sand filtration and post-chlorine disinfection. In total, the two water treatment plants serve approximately 92% of the population of the City of Thunder Bay.

The City of Thunder Bay will be going to a single water source at Bare Point by the end of 2005. Construction and upgrades are presently underway at the Bare Point facility.

In addition to the City of Thunder Bay, the hamlet of Rosslyn Village (Municipality of Oliver-Paipoonge) also has a municipal water supply system. This system consists of two groundwater supply wells drilled in 1974, which services approximately 39 homes in Rosslyn (Engineers Report, May 2001). The source water for the system is a basal sand and gravel aquifer approximately 5 m thick immediately above the bedrock, confined beneath approximately 35 m of clay and silt rich material. Water is pumped from the two wells on an alternating basis to a single water treatment plant, where chlorine is added. Average daily water use is approximately 35 m^3/d, with maximum usage of approximately 50 m^3/d recorded.

4.4 Aquifer Delineation and Characterization

4.4.1 Overburden Aquifers

Overburden thickness mapping illustrates that there is only thin overburden covering much of the northern part of the study area. As such, overburden aquifers do not generally exist in these areas, with the exception of areas associated with glacial moraines, or where overburden sand and gravel deposits have been mapped.

The majority of thicker overburden material occurs in the area of the Kaministiquia River valley and the area immediately north of the valley and south of the Dog Lake Moraine. In addition, thicker overburden underlies the Whitefish River and Slate River valleys to the south and west. An isolated area of thick overburden occurs in the area of Dorion, in the northeast part of the study area. The majority of these areas are underlain by less than 15 m of overburden. As discussed in Section 4.1.1 and 4.1.2, the areas of thickest overburden correspond to depressions in the surface topography of the bedrock, which were largely infilled with unconsolidated material during the most recent glacial period.

In terms of potential water supply, the areas mentioned above offer the best opportunity for groundwater-based supply in the overburden. The remaining area has limited overburden and is less likely to provide sufficient water yields. Additional site-specific investigation would be required to confirm well yields and water quality.

4.4.2 Bedrock Aquifers

The occurrence, and distribution of groundwater in bedrock formations are governed by the rock type, structure, and, in some cases, by the thickness and type of the overlying overburden. Most crystalline bedrock formations have very little inherent or primary porosity and are considered impermeable. Groundwater in such formations occurs only in the weathered and fractured portions of the rock. As such, extensive and/or discrete bedrock aquifers are not identified within the study area.

4.5 Conceptual Hydrostratigraphic Model of the Rosslyn Village Study Area

Based on the above stratigraphy (see Table 4.1) and the geological description of various overburden and bedrock formations within the study area, the hydrostratigraphy of the Rosslyn Village study area could be conceptualized in the following manner:

The overburden materials in the study area consist of beach sands and gravels, shallow water sand, deep water lacustrine clay/silt, deep water sands and till material, underlain by the sandstone and in turn underlain by the Precambrian granitic rocks. Conceptually, hydrostratigraphic layering could be defined as:

Table 4.2 Conceptual Hydrostratigraphic Model*

Hydrostratigraphic Unit No	Formation Type	Relative Hydraulic Conductivity	Comments
Layer 1 (Top Layer)	Sand and Gravel	High	Most extensive along the Kaministiquia River and Dog Lake Moraine
Layer 2	Sand/silt	Moderate	Varying thickness, generally thin and/or combined with Layer 3
Layer 3	Clay/Silt	Low	Associated with glacial tills
Layer 4	Sand and Gravel	Moderate to high	Varying thickness; interbedded with low conductivity zones in areas of thicker overburden; results in zones of multiple aquifers between Kaministiquia River and Dog Lake Moraine
Layer 5 (Bottom Layer)	Bedrock	Low	Higher conductivity zones locally associated with structural zones within the bedrock

*See Appendix E for complete details of the groundwater modelling report.

4.5.1 Summary of Aquifer Characteristics

The main aquifer characteristics of concern are transmissivity (T) and storativity (S) or storage coefficient, also known as "hydrodynamic parameters." The groundwater storage and movement in an aquifer depends principally on these two parameters. As such, these parameters are basic for the understanding of groundwater flow, and form one of the principal inputs to groundwater modelling. As the present study did not involve any pumping tests, aquifer parameters were drawn from the previous hydrogeological investigations and pumping test results. Aquifer parameters are summarized in the groundwater modelling report in Appendix E.

4.6 Groundwater Flow Characteristics

General groundwater flow in the area is toward Lake Superior or major river valleys, and thus reflects the surface topography overall. Groundwater recharge within sand and gravel deposits occurs through direct infiltration of precipitation, and recharge from surface streams and wetlands. Groundwater discharge generally occurs along surface water features, with the discharge supplying the base flow to the streams.

The northern portion of the study area is dotted with numerous lakes and water bodies (see Figure 2.2), which is indicative of impermeable nature of the surficial soils over that area. Thus, the surface runoff over this area is expected to be high. Gravel pit operations in the area may also be facilitating increased recharge locally by collecting water in the gravel pits. However, if sand and gravel are excavated and removed, the total recharge to deeper aquifers would be drastically reduced, impacting the groundwater resources in the area. A brief description of the water table surface and the piezometric surface are discussed in the following sections

4.6.1 Water Table

Static water levels obtained from individual water wells of the MOE water well records database within the shallow and deep subsurface were analyzed to determine the groundwater flow patterns and potential interaction between groundwater flow systems and the surface water. These data have been contoured, with the contours being lines of equal water table elevation in the area. Groundwater naturally flows from areas of higher water table elevation to areas of lower water table elevation, resulting in a flow direction perpendicular to the contour lines. Thus, contouring of the water table elevations allows interpretation of the general groundwater flow direction across a region.

The water table surface elevation for the study area is presented as Figure 4.13. This figure is based on the static water levels observed in water wells drilled to shallow depths, and assumes all wells are under unconfined conditions. All wells drilled to less than 15 m depth were considered in this analysis, as per the TTOR (MOE, November 2001). Because of the sparse data over the northern portion of the study area where overburden is thin or discontinuous, a large number of data points were introduced using the surface water body features. It was assumed that the water table would coincide with

the water levels in the surface water bodies and streambeds. The existence of numerous lakes is suggestive of shallow groundwater flow discharge into those water bodies. In general, the elevation of the shallow groundwater table closely reflects the ground surface elevation (Figure 2.1). Water table elevations range from 183 m amsl at the shore of Lake Superior to 618 m amsl in the western part of the study area, north of Whitefish Lake.

In general, groundwater flows from the northern uplands area toward Lake Superior and the Kaministiquia River valley. Locally, the shallow groundwater flow is influenced by the thickness and distribution of coarser sand and gravel units within the overburden, and topographic highs in the surface of the underlying bedrock. Groundwater flow divides could possibly occur along the bedrock highs.

4.6.2 Piezometric Surface

Groundwater equipotentials within the deeper wells in the study area are presented as Figure 4.14, using data from all wells drilled to depths greater than 15 m, and assumes the wells are under confined conditions. The resulting potentiometric surface closely reflects the bedrock surface elevation contours shown in Figure 4.2. Equipotential elevations range from 183 m amsl adjacent to Lake Superior to 620 m amsl in the western part of the study area, north of Whitefish Lake. Steeper groundwater gradients occur where topographic changes are the greatest, for example in the area of the Nor'Westers. Bedrock valleys that host confined aquifers also influence the potentiometric contours and groundwater movement locally.

4.6.3 Groundwater Recharge/Discharge Areas

In principal, areas where infiltration occurs can be defined as recharge areas. However, recharge areas are more realistically defined as zones having significant downward groundwater gradients (where the groundwater flow is predominantly vertically downward). The best recharge areas are thus topographically elevated areas having permeable formations exposed at surface. Areas of exposed glaciolacustrine and outwash sands and gravels would therefore be important recharge areas.

Groundwater discharge occurs where the water table or potentiometric surface intercepts the ground surface. In general, if the hydraulic head in the aquifer is higher than the ground surface or higher than the head in the water table aquifer, a groundwater discharge zone is defined.

The potential recharge/discharge zones within the study area are illustrated in Figure 4.15. This figure was created by subtracting the potentiometric surface from the water table surface, in order to define the recharge and discharge areas. All areas with negative values have been identified as discharge areas and those areas with positive values are designated as recharge areas. As can be seen from Figure 4.15, a majority of the study area is identified as potentially a regional recharge zone. This indicates some recharge through the thin or fine-grained surficial material that covers the majority of the study

area occurs, with local discharge likely to nearby watercourses. Higher recharge zones are also located associated with the sand and gravel materials as outlined in Figure 4.5.

Areas of potential groundwater discharge occurring near the City of Thunder Bay include the Slate River valley and Kaministiquia River valley and associated area of sands and gravels to the north, where these deposits are topographically lower than the surrounding area. This indicates that larger bedrock valleys can influence the zones of groundwater flow, focusing the areas of groundwater discharge. Smaller areas of groundwater discharge occur along local topographic lows and associated stream valleys, providing baseflow to the numerous streams in the northern part of the study area.

5.0 Groundwater Modelling

5.1 Introduction

This section summarizes the groundwater-modelling component of the Thunder Bay Area Regional Groundwater Study. A more detailed description of the model development and description of various input parameters and result outputs, calibration and uncertainty analysis is provided in Appendix E. The numerical model development and simulations were completed by AMEC with model input from Burnside. Burnside also assisted in the uncertainty analysis on the model results. The evaluation was undertaken using a three-dimensional regional groundwater flow model, developed through the Visual MODFLOW modelling platform. The main objective of the modelling was to delineate capture zones of the municipal wells using a calibrated groundwater model. Three time-dependent capture zones were delineated (2 year, 10 year and 25 year capture zones). Specific objectives of this component of the study included:

- Conceptualization of three-dimensional groundwater model, consisting of various aquifers and aquitards; and
- Delineation of wellhead capture-zones for municipal wells in Rosslyn Village.

Since the main purpose of this modeling exercise was to delineate the capture zones for the municipal wells, the model domain was extended to cover Rosslyn Village and surrounding areas up to the “recharge area” in the north. The two municipal wells located in the Rosslyn wellfield were included in this assessment.

Conceptualization of the hydrogeological setting of the area was based on the hydrogeological mapping and analysis discussed in Section 4.2. The aquifer delineation and characterization discussed in Section 4.2.2 focuses on the conceptualization of the hydrostratigraphy and groundwater flow systems, resulting in a good understanding of the hydrology and hydrogeology of the region.

5.2 Model Used

The numerical model chosen was developed using the finite difference code known as MODFLOW (McDonald and Harbaugh 1988). MODFLOW was chosen for its ability to accommodate heterogeneous systems in three dimensions. This is important to accurately depict the lateral and vertical variability of overburden units, and the vertical variability of bedrock units. MODFLOW also accommodates variable recharge rates, which apply to the study area, as well as large amounts of physical data to model recharge and discharge areas, to assess the potential for contamination and to determine capture zones for pumping wells. The main advantage of MODFLOW over more complicated three-dimensional finite-element models is that it is simpler to use and facilitates efficient calibration of regional-scale models. The particle tracking code MODPATH (Pollock, 1994) was designed specifically to be used with MODFLOW. MODPATH applies the groundwater flow field generated by MODFLOW and can be used to define the origin and destination of groundwater moving through the model. In this study, MODPATH was used to delineate capture zones of the municipal water wells.

5.3 Data Sources

The hydrogeological analysis completed in the study provided the basic input to the model. Detailed model input parameters were drawn from the following sources:

- MOE water well records database, also referred as the Water Well Information System (WWIS);
- Natural Resources and Values Information System (NRVIS) database, which includes Ontario Base Map (OBM) layers;
- Quaternary geology and bedrock geology maps prepared in this study,
- MOE Permit To Take Water (PTTW) database; and
- Engineering Report pertaining to the operating groundwater supply wells.

5.4 Model Domain

The extent of the modelling domain for the model covered Rosslyn Village and extends 1500m east and west of the Roslynn wellfield. The northern boundary was initially located approximately 7000m from the wellfield and the Kaministiquia River was used as the southern boundary for the model.

5.5 Model Input Parameters

The boundaries of the model were chosen to correspond to physical boundaries within the overburden and bedrock aquifer flow systems. As described in Appendix E, the model comprised of 6 layers, represented by:

- 4 layers of unconsolidated material overlying; and
- 2 bedrock layers.

The lower 2 layers represent the upper 30m of bedrock. The top and bottom elevations of the overburden and bedrock aquifers were delineated from the detailed cross-sectional analysis of the hydrostratigraphy.

The boundary conditions that are represented in the model were based on local groundwater flow and the presence of rivers and lakes at the ground surface. A detailed discussion of the lateral and vertical extent of the model is presented in the modelling report included as Appendix E. The details of the input parameters and the results are also discussed in this Appendix.

Hydraulic conductivity in the overburden was estimated from each water well by assigning local hydraulic conductivity values based on the observed lithologies. These point estimates were then interpolated to generate a surface of a spatially distributed hydraulic conductivity field, and re-classified into groups. Vertical hydraulic conductivity was assumed to be 1/10th of the horizontal conductivity. Initial estimates of hydraulic conductivities were taken from representative values (Domenico and Schwartz 1990) based on the lithologic descriptions in the water well records and from site-specific data collected from well tests in the modelling domain.

Vertical infiltration was estimated as input parameter to the model. Quantitative measurements for recharge to the different units are not available. Direct recharge due to precipitation is variable and depends on the geology, with the recharge considered zero for bedrock, very low for silt and clay units and higher for sand and gravel units.

Pumping wells were assigned to the grid cells nearest to the well location coordinates. Pumping well construction details were used to assign well depth, casing depth and screen interval. The two municipal wells in Rosslyn Village were included in the model. The current permitted groundwater taking of 27.5 m^3/day was simulated in the model.

5.6 Model Calibration

Model calibration involves minimizing the difference between simulated and observed water levels by adjustment of input parameters, while maintaining those parameters within a feasible range. Data presented in the modelling report indicates that reasonable calibration of the model was achieved.

A water balance considering all model inflows and outflows was also completed in order to evaluate whether the predicted groundwater flow through the calibrated model is representative of actual flow conditions. For a numerical solution to be considered accurate, a mass balance error of less than 1.0% is desired, indicating that groundwater mass is being conserved within the flow system. The difference between total inflow and total outflow in the model is less than 0.01%, which indicates that there is a high degree of accuracy to the steady-state solution.

5.7 Capture Zone Delineation

Capture zone delineation was completed using the steady-state groundwater flow model described above, and MODPATH advective particle tracking. The capture zones provide insight into the source of water for each well, and therefore direction on the protection of existing water supply sources and location of future sources of groundwater.

Steady-state capture zones were delineated for municipal wells in the model domain using the following constraints:

- MODPATH was used to produce particle pathlines; and
- Reverse particle tracking from each wellhead was used to determine the general shape of the capture zone for each well.

The steady-state capture zones determined in this manner represent the ultimate source of water for each well based on the long-term, average pumping rates for the wells. A time-of-travel capture zone, defined as the volume of water that enters the well over a specified period of time, was determined by discretizing the steady-state reverse particle pathlines into yearly increments. (The nth year capture zone is delineated by connecting the endpoints of each n-year particle pathline). Accordingly, the 2 year, 10 year, and 25 year TOT capture zones were delineated for the Roslynn Village wells within the model domains.

As discussed later in this section, a sensitivity and uncertainty analysis of the modeled capture zones was completed to improve confidence in the model results. As can be expected, the capture zones incorporating the uncertainty analysis extend over larger areas.

The delineated capture zones for the Rosslyn Wells are shown in Figure 5.1. Each 25-year TOT zone is approximately up to 50 m wide and extends over a distance of about 1,500 m to the northwest from the municipal wells. Each 10-year TOT is also approximately 50 m wide and is about 1,300 m long. Each 2-year TOT is approximately 40 m wide and about 300 m long. Note that 50-day TOT were estimated to be about 25 m wide and 30 m long. This result is consistent with the 15.5 m 50-day capture radius (31 m diameter) predicted by Waters Environmental Geosciences Ltd. (March, 2003).

6.0 Water Use and Water Quality

6.1 Water Use

6.1.1 General

Water use in the Thunder Bay and surrounding area can be grouped into the following four main categories:

- Individual/Domestic;
- Municipal/Public;
- Commercial/Industrial; and
- Agricultural.

Present uses are discussed in terms of the adequacy of supplies to meet the demands of the above four categories. In terms of groundwater and in order to ensure the sustainable growth of an area, the rate of groundwater extraction should be related to the groundwater recharge and allowable groundwater withdrawal. Allowable groundwater withdrawal is based on maintaining satisfactory baseflow into the local streams. If groundwater use is more than the groundwater recharge, a groundwater overdraft (or "mining") will occur which would result in a reduction of the total available groundwater resource and impact to streams. The assessment of total water use and the groundwater budget presented in this report will therefore assist to develop appropriate management strategies that minimize the risk of groundwater overdraft.

The data sources for the assessment of the amount of water used by residents and businesses within the study area included: The City of Thunder Bay –City Water Department, the surrounding municipalities, Ministry of the Environment water well records, permits to take water, and typical water consumption estimates based on type of use. Table 6.1 provides a summary of water users in the City of Thunder Bay and surrounding areas.

Table 6.1: Summary of Water Users

Water Users	**Service Type**	**Population**[1]
City of Thunder Bay	Municipal	109,016
Municipality of Oliver Paipoonge	Private	5,749
Roslynn Village	Municipal	113
Municipality of Neebing	Private	2,049
Township of Shuniah	Private	2,466
Township of Conmee	Private	748
Township of O'Connor	Private	724
Township of Gillies	Private	522
Fort William	Private	599
Township of Dorion	Private	382

[1] Statistics Canada Data (2001).

The City of Thunder Bay municipal water supply is comprised mainly of surface water supplied from either the Bare Point Water Treatment Plant (on Lake Superior) or the Loch Lomond Plant (on Mount McKay). Groundwater from private wells is the supply source in areas that receive minimum service from the municipal supply and in the rural areas. The surrounding townships and municipalities are supplied by groundwater from individual private wells. There is one public supply wellfield (the Rosslyn wellfield) that supplies water to Rosslyn Village, a section of the Municipality of Oliver Paipoonge.

Water demands for areas using individual private wells are estimated based on an estimated 350 litres per capita per day (l/c/d). There are also a number of Permits to Take Water (PTTW) that have been issued for private systems using more than 50,000 L per day. Descriptions for each type of water users are provided in the following sections.

6.1.2 Individual/Domestic Systems

The majority of the City of Thunder Bay is serviced by a public supply of water, with individual/domestic systems located primarily in areas termed Minimum Service Rural Residential (MSRR) and in rural areas within the City limits. With respect to individual private wells within the city limits, we estimate that approximately 8% of the population, or 8,721 individuals are using groundwater. Therefore, based on the consumption rate of 350 l/day/capita, approximately 1,114,107 m^3/year is used by residents in the City of Thunder Bay.

Within the surrounding Municipalities and Townships, the primary source of water is groundwater from private wells. Based on the assumption that each resident uses 350 litres per day (Best Management Practices Water Wells, 1997) and with of total population of 13,783, (see Table 6.1) water demand is estimated at 1,760,778 $m^{3/}$year. Analysis of the MOE water well record data on wells in the area indicates that approximately 91 % of the over 3,000 wells evaluated in this study are noted as being used for domestic purposes.

6.1.3 Municipal/Public Systems

The Municipal/Public supply system accounts for the largest water-consuming category within the study area, this supply type is limited to the City of Thunder Bay and to Rosslyn Village. The system in Thunder Bay is comprised of surface water takings from Lake Superior and Loch Lomond. In Rosslyn Village, the municipal supply is from groundwater. A summary of the Municipal water system is presented in Section 4.2.1 of this report.

According to the Thunder Bay City Water Department, Bare Point (Lake Superior) supplies 64 million litres per day and Loch Lomond supplies 28 million litres per day for a total of 92 million litres per day (33.6 M m^3/ year) for a population of 109,016. Data from the same source indicates that this water supplies approximately 92 % of the population of the City of Thunder Bay.

The Rosslyn Wellfield is comprised of two wells that operate alternately and feed into a small treatment system. The rated capacity of the treatment plant is 345 m^3/day and the permitted water use of the municipal wells is 27.5 m^3/day (Wardrop, 2001).

In the areas designated as rural, surface water is less commonly used and the population is dependent to a greater extent on groundwater. It is assumed that within these communities the main source of water supply is from groundwater wells. Analysis of the MOE database for the area indicates that a total of sixty (60) wells are noted as being used for Municipal / Public Supply.

6.1.4 Commercial/Industrial Systems

The commercial/industrial system is primarily serviced through the municipal network. The southern section of the city has the higher industrial demand (Proctor and Redfern Group, 1985) and is thus dependent on Loch Lomond for its supply. The total permitted withdrawals for this water use is estimated to be 1,332,250 m^3/year based on MOE PTTW records.

According to MOE records, a total of seventy-seven (77) wells have been reported as being used for commercial/industrial supply.

6.1.5 Permits to Take Water (PTTW)

Permits to Take Water (PTTW) are required for withdrawals of more than 50,000 L/day (50 m^3/day). The MOE provided the PTTW database. Figures 6.1 and 6.2 provide a summary of all the PTTW showing the permitted rates of usage. The type of use of each of the PTTW for groundwater takings is also described in Figure 6.1. The permits range from less than 50 m^3/day to 13,638 m^3/day. Refer to Tables F-1 and F-2 in Appendix F for details on the PTTW.

6.1.6 Agricultural Uses

The study area does not support any large-scale agricultural (irrigation and livestock) operations. As a result, groundwater demand for such uses is negligible. The MOE database notes sixty-two (62) wells used for watering stock and one (1) well for irrigation purposes. This accounts for approximately 2% of all the wells in the database. The total permitted withdrawals are estimated to be 2,444,415 m^3/year based on MOE PTTW records.

6.2 Groundwater Quality

6.2.1 Regional Groundwater Quality

The regional groundwater quality was assessed from the available data. At the outset, it was decided that no additional data collection would be undertaken as part of this study. The MOE historic water quality database for the area was evaluated and the results are

presented in this section. Data from a later date were also collected and analyzed for wells located in the Thunder Bay area. The absence of long-term water quality data for the area did not allow for the evaluation of trends in water quality.

We understand that there are water quality data for the Slate River Valley, Rosslyn Village and Kakabeka Falls and Murillo areas; however, the well location data are not sufficient for plotting the locations. Additional detailed studies are recommended for these areas.

A total of 652 wells were in the water quality database. The majority of the wells are within the City of Thunder Bay. Of these, 253 had UTM coordinates. A total of two hundred fifty three (253) wells were evaluated and the results are summarized in Table F-3, Appendix F. The results are summarized in the following sections.

6.2.2 Municipal and Domestic Well Water Study

The water chemistry data analyzed for this study covers 253 wells spread out over the study area. These wells provided data on the six parameters that were used to characterize water quality in the study area. Data were collected and analyzed for the following parameters:

- Nitrate
- Sodium
- Chloride
- Iron
- Manganese
- Hardness

The results showed that there was considerable variation in water quality across the study area and the results of the analysis are summarized in Table 6.2 below:

Table 6.2 Summary of Water Quality

Parameter	**Nitrate** (mg/L)	**Sodium** (mg/L)	**Chloride** (mg/L)	**Iron** (mg/L)	**Manganese** (mg/L)	**Hardness** (mg/L)
ODWS	10	200	250	0.3	0.05	80
Maximum	11.5	1,171	2,022	51.6	6.14	8,284
Minimum	0	0.2	0	0	0	5.5
Average	0.54	72.4	123.7	1.55	0.16	349.13
Std. Deviation	1.32	154.1	259.3	5.22	0.53	783.21
Percentage Exceeding ODWS	0.5%	60%	12.4%	35.2%	44.2%	91.5%

Spatial evaluation of the above data did not show any significant trends the in location of wells and the parameter values. Figures F-4 through F-9 in Appendix F, show the variation in parameter values running east- west and north- south across the study area.

Ambient nitrate concentrations tend to be in the 0-2mg/L range, which suggests minimal impacts from anthropogenic (man-induced) sources. The majority of the sodium concentrations are above the Ontario Drinking Water Standard of 200-mg/L. Chloride

concentrations show a similar trend. Iron concentrations are variable throughout the study area; however, elevated iron concentration is common in many groundwater wells in Ontario. Manganese concentrations are similar to the iron concentrations, in terms of number of exceedances. Hardness concentrations indicate that the water is very hard throughout the areas tested.

It is also noted that all sampled parameters have been exceeded in at least one well. The parameters exceeded are indicative of natural or man-made conditions affecting the quality of groundwater in the study area.

6.2.3 Chloride

An AO has been established by the MOE for chloride at 250 mg/L. At this concentration, chloride becomes detectable in drinking water by a salty taste. Chloride is found commonly in nature and is a part of various salts such as Sodium Chloride (NaCl) and Potassium Chloride (KCl). Chloride is non-toxic but its presence may also be indicative of the impact of road salts on groundwater.

Data evaluated for the study area shows that the average chloride encountered in the study area was 124 mg/L; this is below the AO. Only 12.4% of the samples exceeded the AO and from an evaluation of their spatial distribution, these incidents of exceedance seem concentrated in the centre of the study area. Figure 6.3 shows that the instances where chloride is above the AO appear to be concentrated in linear bands around the major roadways in the centre of the City of Thunder Bay. This suggests that road salts may be the cause of elevated chloride levels in the groundwater of the study area. The maximum measured value is 2,022 mg/L and the large standard deviation of 259 indicates that there is a wide variation in this parameter across the area. This wide variation in values may be reflective of variations in amount of road salt applied to various types of roads and of the distances of the wells from the roads. However, elevated sodium and chloride concentrations have been known to naturally occur in the groundwater in the study area. When viewed in association with the data on Sodium, and the potential source being road salts, it becomes important to further evaluate the impact of road salting activities on groundwater quality, versus ambient or background concentrations of these parameters in the study area.

6.2.4 Nitrate

A nitrate concentration of 10 mg/L is the Maximum Acceptable Concentration (MAC) for this parameter in drinking water. The MAC is defined for parameters that when present above a certain concentration, have known or suspected adverse health effects (MOE 2003). Nitrate in groundwater is known to be the cause of methemoglobinemia, *or "blue baby syndrome."* This phenomenon occurs when the bloods ability to carry oxygen is diminished. Blue baby syndrome affects young babies and the elderly and is not evident in older children or adults. Young domestic and farm animals consuming water with elevated nitrate concentrations are also known to suffer similar effects. Excess nitrogen in surface water bodies may also promote the growth of aquatic plants and algae. When

these plants die back, they create a deficit in dissolved oxygen that may then lead to fish kills.

Figure 6.4 shows the nitrate concentrations across the study area. Of the wells with coordinates sampled, only one (1) exceeded the ODWS for nitrate. Two (2) wells exceeded a value of 6 mg/l while the value for the remainder of the wells remained low. With these high values removed, the average value for nitrate across the study area would fall to 0.41 mg/l and the standard deviation would also fall to 0.41. There is no apparent spatial trend in the distribution of nitrates across the study area (Figure F-4, Appendix F) and each occurrence of elevated nitrate may be related to locally occurring conditions. Based on the concentrations of nitrates in the data provided, nitrate in the groundwater is not a significant problem at the present time.

6.2.5 Iron

Excessive levels of Iron in groundwater may impart a brownish colour to laundry or plumbing fixtures as well as to the water itself. It may also result in a bitter, astringent taste in water and beverages. The precipitation of iron may also promote the growth of bacteria in water mains. Iron is not known to be toxic and as such, an aesthetic objective has been established for this parameter. Based on the above effects the AO for iron in drinking water has been set at 0.3 mg/L as part of the ODWS (MOE 2003).

Evaluation of the water quality data shows no clear spatial trend in the distribution of iron across the study area (Figure 6.5). Iron levels vary across the study area from a low of 0 mg/L to a high of 51.6 mg/L. The degree of variation is low and is reflected in a low standard deviation of 5.22. The average value for this parameter in the study area is 1.5 mg/L and 35 % of all samples exceed the established AO. Iron is usually present in groundwater as the result of mineral deposits and chemically reducing underground conditions. The absence of a spatial trend and the low variation in Iron suggests that this parameter is a naturally occurring feature of groundwater in the aquifer. This is typical in groundwater in Ontario.

6.2.6 Sodium

As defined by the ODWS (MOE 2003), the Aesthetic Objective (AO) for sodium is 200 mg/L. An Aesthetic Objective is established for a parameter that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. Sodium at its AO becomes detectable in drinking water by its salty taste. Sodium however is not toxic and consumption in excess of 10 mg/L per day by normal adults does not result in any apparent health effects (MOE 2003). Persons suffering from hypertension or congestive heart disease may require a sodium restricted diet and the intake of sodium in drinking water could become significant. As a special condition, and to deal with this threat, the local Medical Officer of Health should be notified if sodium levels exceed 20-mg/L. The local Medical Officer of Health is then charged to inform local physicians for their use with their patients.

The values for sodium showed a great degree of variation across the study area. Figure 6.6 presents the sodium concentrations across the study area. The wide variation in the values for sodium is noted in the high standard deviation (154) for the sample set. Further evaluation of the data shows that the Aesthetic Objective (AO) of 200 mg/L for sodium is exceeded in 14 wells or 6.2 % of the samples. The values reported also exceed 20 mg/L in 60% of the cases. The average concentration in the sample set was 72 mg/L, with the maximum concentration encountered being 1,170 mg/L. The high percentage of wells (60%) that are above the 20-mg/L level does require that persons with the above-mentioned medical conditions make careful use of groundwater in the study area.

The source of sodium in the groundwater in the study area requires further evaluation. There are a number of potential sources that could be influencing the results, however, additional studies are required.

6.2.7 Manganese

An AO has been established for Manganese at 0.05 mg/L. As with iron, manganese will stain laundry and fixtures black and at excessive concentrations, it causes undesirable tastes in beverages. The precipitation of manganese also promotes the growth of bacteria in water mains. Manganese is not known to be toxic and is objectionable based only on its effect on the colour of the water. Iron and Manganese, when present in significant concentrations in groundwater, may present problems in association with bio-fouling of wells, pumps and water mains. Bio-fouling generally refers to the degradation of groundwater quality by bacteria and contributes to iron/manganese encrustation and corrosion of wells, pumps, distribution lines, and treatment systems. This process is very persistent as episodes of bio-fouling are usually recurring and result in a drop in production or transmission through a water supply system.

No clear spatial trend could be identified in the sample data for this parameter. The data showed a smaller variation than found in other parameters across the study area with a standard deviation of 0.5. The average value for the samples was 0.16 mg/L, which is above the established AO. This is indicative of the overall trend in the study area where 44% of the wells sampled were above the AO for this parameter. Iron and Manganese at high levels in drinking water as previously stated are only objectionable based on the colour they add to water, as they are naturally occurring elements, their effect on groundwater is largely due to the local geologic and hydrogeologic setting. Figure 6.7 illustrates the results for manganese.

6.2.8 Hardness

Hardness is caused by dissolved calcium and magnesium and is expressed as the equivalent quantity of calcium carbonate in milligrams per litre. An Operational Guideline (OG) has been established for hardness at between 80-100 mg/L as calcium carbonate, with hard water being above 100 mg/L. On heating, hard water tends to form scale and will form a scum with regular soap. Hardness in excess of 200 mg/L is considered to be poor but tolerable, hardness in excess of 500 mg/L is regarded as

unacceptable for domestic purposes. Conversely, soft water (below 80 mg/L) may result in accelerated corrosion of water pipes. Softening of water using a domestic softener increases the sodium content of drinking water and may contribute significantly to the daily intake of persons on a sodium restricted diet.

Figure 6.8 illustrates the results of the hardness analysis. The evaluated data shows that 88.9 % of the wells have a hardness that is above the OG. There is no clearly defined trend in space across the study area with hardness ranging from a minimum of 5.5 mg/L to a maximum of 8,284 mg/L. The variability of hardness in the water suggests that this is a natural property of the water based on its interaction with the aquifer formation. Based on the hardness results, it can be assumed that individuals in the study area would tend to utilize water softeners as part of their individual water supplies. It should be noted that their use of softeners would add to the sodium content of drinking water. Thus, artificially softened water would become a significant source of sodium for persons on a sodium-restricted diet, such as persons suffering from hypertension and congestive heart disease. It is recommended that such persons in cases such as this should use a separate unsoftened supply for cooking and drinking (MOE 2003) and hence guard against this intake. Naturally soft water occurs in only 8.5% of the samples.

6.2.9 Summary

There are a number of factors that influence groundwater quality including, but not limited to: naturally occurring elevated concentrations of certain parameters (e.g. sodium in the Slate River Valley, fluoride in the Oliver Road area) and associated anthropogenic factors (road salting, spills, leaking underground storage tanks, etc.). Groundwater quality monitoring programs are warranted for several parts of the study area. The water quality data discussed above is limited to the greater Thunder Bay area.

Additional studies are required for the Slate River Valley area due to the domestic and agricultural use of groundwater in the area. The communities of Kakabeka, Rosslyn Village and Murillo are presently experiencing development pressures for growth and long-term water quality is an issue. Additionally, resolution of the elevated sodium and chloride concentrations requires additional study to assess the nature, potential source and extent of the elevated levels of these parameters. Recommendations are provided in Section 14 of this study.

6.3 Landfill Issues

While there are several landfills in the study area including domestic, industrial (wood waste, ash and sludge), two landfill site reports were reviewed in detail. These include: the MacGregor Landfill in the Township of Shuniah and the John Street Landfill in the City of Thunder Bay.

6.3.1 MacGregor Landfill

The MacGregor landfill site is located along Highway 11/17, approximately 40 km northeast of the centre of the City of Thunder Bay (Figure 9.1). The landfill has been in operation since the early 1970's and has over the years accepted a variety of waste types.

Various improvements have taken place at the landfill after a 1997 episode where residents of the Township of Shuniah complained to the MOE regarding leachate leaving the landfill site and causing visible discolouration in surface water entering Lake Superior (KGS Group 1998). Following this event, a landfill assessment was undertaken and the following conditions were established.

The groundwater table is found in the overburden deposits with flow being vertically downwards towards the bedrock (KGS Group 1998). At leachate impacted wells, DOC, iron and manganese were elevated. Barium objectives were also exceeded in one bedrock well and manganese was exceeded at many wells; these are thought to be related to the background groundwater conditions. Leachate impacts are present in groundwater in the overburden mainly at the edge of the fill, where indicator parameters such as specific conductance, chloride, sodium and ammonia are used. This impact is seen to decrease downgradient in the overburden and even further in the bedrock. At the property boundaries the groundwater meets the Reasonable Use Criteria for most parameters. Exceedances by chloride and total dissolved solids are assumed to reflect the influence by road salting. It was concluded by the KGS Group that the impact to groundwater was limited but that a development plan and monitoring program are required to manage the landfill.

As a follow up to their 1998 study, the KGS Group completed a report on the monitoring program at the landfill in 2002. In this report (KGS Group 2003) it is stated that the impacts were similar to those measured in previous years, with leachate impacts to both groundwater and surface water being observed in the immediately downgradient of the landfill and reducing to background concentrations at the proposed downgradient attenuation zone boundary. Domestic wells sampled as part of the 2002-monitoring program showed no impact from the landfill leachate, with water being typical of the overburden aquifer and some showing an impact from a past or present septic system.

6.3.2 John Street Landfill

The John Street Landfill is located just west of the City of Thunder Bay and is bounded by John Street on the north, Mapleward Road on the east, Gratton Road on the west and Oliver Road on the south (Figure 9.1). The landfill has been developed to handle all domestic and non-hazardous commercial solid wastes from the city. The landfill is also the final disposal site for all sludge produced by the City of Thunder Bay Water Pollution Control Plant (WPCP) (KGS Group, 1992).

Leachate from the John Street site is currently collected in a perimeter ditching system and discharged from the site following dilution with local surface water outflows. Subsurface discharges are monitored by an observation well system. Routine monitoring of this network has led to the following characterization of the leachate impact.

Information from KGS Group (2002) indicates that groundwater flow direction is primarily to the east-southeast. The impact of the leachate on groundwater has been relatively well contained by the in-place perimeter ditch system. However breakthroughs have occurred in sections of the west cell of the landfill while leachate parameter concentrations remain elevated in the ditches surrounding the active east cell of the landfill. Groundwater found at the east boundary of the site was slightly above the maximum allowable concentration for nitrate. Also the Reasonable Use Criteria for chloride was exceeded at the north boundary and west boundary. Groundwater outside of the ditching system to the south is affected by leachate in the upper overburden zone; this impact is only minimal to bedrock in this area. The effects of leachate have not extended to the overburden to the west or to the bedrock to the south (KGS Group 2002).

Conditions at domestic wells sampled during the 2001 program showed no significant impact from the landfill. To the north and east of the landfill, increases in Chloride and Nitrate continue to be reported. These impacts are thought to be related to the effects of a shallow septic system on groundwater. One well to the south of the landfill continues to show poor water quality with barium exceeding ODWS and a very high conductivity and chloride. These values are however similar to historic levels and are not related to the landfill.

The landfill is also reported as not significantly impacting the Neebing River. Levels of iron found in the Neebing exceed PWQO but these values are elevated above and below the landfill. Zinc was found to be elevated above the landfill and copper was only detected above the landfill.

6.3.3 Summary

Landfills can be considered as point sources of contamination. Depending upon the proximity of water wells and the direction of groundwater flow, there can be impacts to the local groundwater regime. In most cases, the groundwater impacts are limited to the lands within the landfill property. Off-site groundwater impacts are assessed on a case-

by-case basis. Many of the small former landfill sites in Ontario are not monitored and little is known about their groundwater impacts.

The MOE reviews annual monitoring reports for landfills and are advised of water quality changes in the monitoring wells that are situated on the landfill property. There are a variety of chemical parameters that can be elevated in groundwater due to the presence of a landfill. Generally, the contaminant plume from the landfill is limited in size and areal extent. There are many factors that influence the size and shape of the contaminant plume at a landfill. Small landfills generally tend to have limited contaminant plumes. Larger, older landfills tend to have larger contaminant plumes.

7.0 Surface Water Assessment

The following section provides a general analysis of surface water resources and an average annual water budget. An analysis of the available surface water resources is essential in understanding the interaction between groundwater and surface water. Further, it provides a better understanding of the hydrologic components of the region's water budget.

7.1 Watershed Characteristics

There are twelve (12) sub-watersheds that are completely contained within the study area. Their boundaries are illustrated in Figure 2.2. The sub-watersheds within the study area mainly drain southward towards the City of Thunder Bay and/or Lake Superior, and typically drain areas within both the Precambrian uplands and the terraced clay lowlands. A number of sub-watersheds occur in the Black Bay area along the eastern section of the study area, flow in these sub-watersheds is easterly into Black Bay. A detailed assessment of the surface water characteristics is presented in this section of the report.

The surface water resources within the Lakehead Region Conservation Authority (LRCA) jurisdiction have been documented in several reports that include information on flood flows, flood control and flooding. These reports are summarized below.

7.1.1 General

The Kaministiquia River and its tributaries form the most significant drainage system in the Thunder Bay area. The Kaministiquia and its tributaries, the Slate River and the Whitefish River drain a major portion of the area just west of Thunder Bay. These rivers flow into Lake Superior at Thunder Bay. Other major rivers in the Thunder Bay area include; Neebing River, Pennock Creek, McIntyre River, Current River, McVicar's Creek and Mosquito Creek. Summaries of flows in the above-mentioned rivers are included below and are also outlined in TableG-1, Appendix G.

7.1.2 Subwatersheds

Kaministiquia River

The Kaministiquia River is the primary discharge point for drainage from the Thunder Bay area to Lake Superior. The river begins just south of Dog Lake and makes its way generally southward through areas such as Millar and Kakabeka Falls. The river is joined by the Whitefish River in the vicinity of Stanley, at which point it also swings around to start flowing eastward towards Thunder Bay and Lake Superior. In the region between Kakabeka Falls and Rosslyn Village, the river flows across a distinct physiographic region described as the deltaic uplands (section 4.1). In this region, the river has developed gentle meanders. Downstream of Rosslyn Village, the river is joined by its second largest tributary, the Slate River. Physiographically, the region from Rosslyn Village to Lake Superior is known as the lower deltaic plain. In this region, the river meanders significantly while flowing east, eventually discharging to Lake Superior between the City of Thunder Bay and Fort William First Nation. The Kaministiquia River Water Management Plan (OPG/MNR, 2004) contains the most recent flow data.

Neebing River

Theil's (1987) report investigated the hydraulics and hydrology of the Neebing River, which flows from north to south through the City of Thunder Bay. The drainage area of this river has been estimated as 216 km^2.

Proctor & Redfern (1978, 1981) used Water Survey of Canada flow records to conduct a regional flood frequency analysis for the Neebing River. This resulted in a calculated 100-year flow of 104 cubic metres/second (cumecs) or 3,708 cubic feet/second (cfs) upstream of Hwy 11-17. This flow compares favourably with the value of 120 cumecs (4,273 cfs) calculated by Theil using the HYMO computer model that is based on the Soil Conservation Service (SCS) Curve Number (CN) method.

Flooding has not been an issue in the Upper Neebing River. Proctor & Redfern (1978) stated that there is the possibility of flooding due to obstructions in the Neebing River downstream of Ford Street. It was suggested that a diversion to reduce peak flows in the Neebing River would help to reduce the potential for flooding in that area.

The Neebing - McIntyre Floodway was constructed from 1980 – 1984 to divert flows from the Neebing River at Ford Street to the McIntyre River when flows in the Neebing River exceed 9.99 cumecs (353 cfs). The maximum design flow downstream of the diversion is 26.9 cumecs (953 cfs).

Pennock Creek

Pennock Creek is a short (12km) tributary of the Neebing River and its drainage area has been estimated as 44 km^2. Its flow was calculated by Theil (1987) as part of the Neebing River HYMO computer model. The flow at the downstream limit of Pennock Creek was calculated to be 22.4 cumecs (791 cfs) based on calculations, which have been calibrated using three storms.

McIntyre River

Theil (1987) states that the McIntyre River flows from Trout Lake in the east, westerly into the City of Thunder Bay with an estimated drainage area of 146 km^2. The McIntyre River meanders to the north and south and receives water from no less than eight (8) tributaries. According to Theil (1987), the McIntyre River sub-watershed remains largely undeveloped.

As with the Neebing River, Proctor & Redfern (1981) used Water Survey of Canada flow records to conduct a regional flood frequency analysis for the McIntyre River. The calculated peak flow for the McIntyre River is 212 cumecs (7,487 cfs), which is slightly higher then the peak flow of 161 cumecs (5,686 cfs) calculated by Theil (1987).

Mosquito Creek

Mosquito Creek originates to the north of the Thunder Bay Correctional Centre and flows south before curving to the southwest parallel to Hwy 61, and then joining with the Kaministiquia River (Theil, 1987). The drainage area for Mosquito Creek has been estimated as 30 km^2.

The peak flow within Mosquito Creek was calculated by Theil (1987) to be 123 cumecs (4,361 cfs) based the OTTHYMO computer model and the watershed parameters estimated by The Lathem Group Inc (1984).

The Lathem report (1984) outlines significant evidence that points to a significant erosion problem along the banks of the Mosquito Creek. They point to the smooth creek bed, steep slope, highly erodable soils and relatively bare and unvegetated slopes in areas that are prone to undercutting and gullying.

McVicar's Creek

McVicar's Creek is a relatively short (15 km) watercourse running from the north to the south to Lake Superior (Theil, 1987). It has an estimated drainage area of 48 km^2.

Theil (1987) used the HYMO computer program to determine the peak flow at the outlet to Lake Superior. This study was updated by Dillon Consulting Engineers (1995), and concluded that the Regional Storm flows were approximately 66.4 m^3/s at the outlet to Lake Superior. There have been numerous improvements to bridge and culvert crossings,

which have reduced the estimated flood damages during the Regional Storm event to approximately 50 structures.

Current River

The Current River originates north of the City of Thunder Bay and drains a total of 700 km^2 at its outlet to Lake Superior (The Lathem Group, 1986). A number of studies have been completed on the Current River in the past including a water use study completed by James F. MacLaren Ltd in 1970, a flood and fill line mapping study in 1986 by the Lathem Group, and a watershed study completed by Proctor & Redfern Limited in 1991. Proctor & Redfern (1991) identify Current Lake as the headwaters for the Current River. From Current Lake Current River flows south through Ray, Onion and Boulevard Lakes into Lake Superior east of the City of Thunder Bay.

7.2 Water Budget

In order to assess the net available groundwater resources within a given system, it is essential to understand the inputs to and outputs from that system. In Section 4, the physio-chemical characteristics of the groundwater flow system within the study area and the geologic and physiographic features that control the groundwater flow within the system were presented. In this section, a description of the water budget, based on a hydrological analysis for the study area is provided. The water use estimates are included in a later section of this report, which completes a comprehensive assessment of the water balance in the City of Thunder Bay and the surrounding area.

A water budget was completed in order to relate the amount of water infiltrating into the subsurface (contributing to groundwater) with the amount of water being drawn for water supply. The water budget of a natural hydrologic system is calculated using a simple water balance approach defined by:

$$\mathbf{P + Sw_i + Gw_i = ET + R + I + Sw_o + Gw_o + \Delta S}$$

Where:

- P = Precipitation
- Sw_i = Surface water inflow into the system from outside
- Gw_i = Groundwater inflow into the system from outside
- Sw_o = Surface water out-flow from the system
- Gw_o = Groundwater out-flow from the system
- ET = Evapotranspiration losses
- R = Surface runoff
- I = Infiltration
- ΔS = Change in storage (both surface water and groundwater)

The primary interest in the water budget for this study is related to the groundwater components. However, as noted in Section 4, surface water and groundwater interact, and a general understanding of both systems is necessary for the complete evaluation of any of these system components. Assuming that groundwater and surface water inputs

and outflow are constant, and that the change in storage in both the surface water and groundwater reservoirs within the system is negligible, the above equation can be simplified to:

$$P = ET + R + I$$

Based on this equation, the water budget calculation takes into account the total amount of precipitation that falls over the City of Thunder Bay and the surrounding area and determines how much:

- Is lost through evaporation and transpiration;
- Contributes to surface water runoff; and
- Infiltrates into the subsurface.

There are two climate stations with both temperature and precipitation records within the study area: Thunder Bay Water Pollution Control Plant (WPCP) and Thunder Bay A Station. Data from both climate stations were analyzed in this study. The climate normals for both stations were very similar (Table 7.1). Thunder Bay A Station was selected for the climate normals for the study area as shown in Table G-2, Appendix G. The climate normals generated from Thunder Bay A Station data between 1971 and 2000 indicate that the average annual precipitation (rain plus snow) is 712 mm. A summary table of climatic normals for each station is presented in Table 7.1 below. Given that the study area covers approximately 6,500 square km, 712 mm would represent a total volume of precipitation of 4.63×10^9 m^3 per annum.

Table 7.1 Climatic Normal Data

Month	Thunder Bay WPCP		Thunder Bay A	
	Precipitation (mm)	**Temperature (°C)**	**Precipitation (mm)**	**Temperature (°C)**
January	39.4	-14.5	31.3	-14.8
February	25.0	-11.7	24.9	-12.0
March	40.2	-5.6	41.6	-5.5
April	31.4	2.6	41.5	2.9
May	67.0	9.0	66.5	9.5
June	81.9	13.5	85.7	14.0
July	87.4	17.4	89.0	17.6
August	88.3	16.4	87.5	16.6
September	91.5	11.5	88.0	11.0
October	58.2	5.4	62.6	5.0
November	50.9	-2.3	55.6	-3.0
December	43.6	-11.0	37.5	-11.6
Mean Annual	**705**	**2.6**	**712**	**2.5**

Source: Environment Canada.

7.2.1 Direct Runoff

Surface water runoff is estimated based on factors such as ground cover (pasture, woodland, cultivated or urban), surface slope (flat, rolling or hilly) and soil texture (MTO, 1995-1997). The remainder of the water infiltrates into the subsurface and contributes to groundwater recharge. Table 7.2 presents the runoff coefficient estimates based on the details of the ground cover factors and the land use.

Land use within the study area is estimated to comprise approximately 3% urban, 7% pasture and 90% woodland. The topography is rolling to hilly in the north portion of the study area, whereas very gentle slopes define the southern portion that includes the City of Thunder Bay. It is estimated that the average surface water runoff would represent approximately 32% of the average annual water budget surplus for the area (4.10×10^8 m^3). The remainder of the water surplus (8.70×10^8 m^3) would be available for groundwater infiltration.

Table 7.2 Direct Runoff Coefficient Estimates

Land Use	Topography	Run off Coefficient Based on Soil Type			Percentage of Study Area	Runoff Coefficient
Cultivated		Open Sandy Loam	Loam or Silt Loam	Clay Loam or Clay		
	Flat (0 to 5%)	0.22	0.35	0.55		
	Rolling (5 to 10%)	0.30	0.45	0.60		
	Hilly (10 to 30%)	0.40	0.65	0.70		
Pasture	Flat (0 to 5%)	0.10	0.28	0.40	7.1%	0.34
	Rolling (5 to 10%)	0.15	0.35	0.45	0.5%	0.30
	Hilly (10 to 30%)	0.22	0.40	0.55		
Woodland	Flat (0 to 5%)	0.08	0.25	0.35	62.9%	0.28
	Rolling (5 to 10%)	0.12	0.30	0.42	23.4%	0.36
	Hilly (10 to 30%)	0.18	0.35	0.52	3.2%	0.43
Urban		0.25 to 0.40			2.9%	0.29
	Weighted Average					**0.32**

Source: MTO Drainage Management Manual Design Chart (1995-1997).

A sensitivity analysis was completed to assess relative contributions to surface water runoff and groundwater infiltration as a function of the runoff coefficients used. Precipitation and evapotranspiration remained constant with the surface water runoff ranging from 20% to 40%. If the runoff coefficient is 0.20, then the available infiltration is approximately 1.03×10^9 m^3/annum. Conversely, if the runoff coefficient were 0.40, then approximately 7.67×10^8 m^3/annum would be available for infiltration.

7.2.2 Evapotranspiration

Evapotranspiration losses were calculated using the Thornthwaite method (1948), which takes into consideration average monthly temperature and hours of daylight. The Thornthwaite method is very widely used in water balance estimates and has been chosen in the present study for its simplicity and the ability to use available data. The difference between precipitation and evapotranspiration is available for surface runoff and groundwater infiltration. During hot dry periods, the evapotranspiration will exceed the precipitation, resulting in a deficit; whereas when the precipitation exceeds the evapotranspiration, there will be "surplus" water available for runoff and infiltration.

Based on the application of the Thornthwaite method (refer to Table G-2, Appendix G) to data from Thunder Bay A Station, 3.35×10^9 m^3/annum of this water would be lost through evaporation and transpiration with the remaining 1.28×10^9 m^3/annum representing water surplus available for groundwater infiltration and surface water runoff.

7.2.3 Groundwater Infiltration

The final component of the simplified water balance equation is groundwater infiltration (I). Since the average annual evapotranspiration (ET) and runoff (R) have been calculated above, groundwater infiltration (I) accounts for the remainder of the net water balance. As a result, we have estimated that approximately 8.7×10^8 m^3 of water is available annually for groundwater infiltration. Table 7.4 provides a complete summary of the water budget for the study area.

7.2.4 Groundwater Recharge

Infiltrating precipitation may be discharged to watercourses as baseflow, or recharge the groundwater system. For the purposes of this study, it is essential to determine the average annual groundwater recharge in order to compare it to the average annual groundwater consumption, which is calculated in the following section of the report.

7.2.5 Groundwater Discharge

Generally, one would compute groundwater discharge to watercourses by analyzing the low-flow patterns of each watercourse within the study watershed area. This would require long-term streamflow monitoring through a comprehensive network of streamflow gauges. Since this network of streamflow gauges is limited, the calculation of groundwater discharge to watercourses is not possible.

A summary of the study area water budget is presented in Table 7.3.

Table 7.3 Water Budget Summary

Water Budget	Units	Total	Comments	Source
Study Area	m^2	6.50×10^9		Burnside estimated watershed delineation
Precipitation	m^3/yr	4.63×10^9	712 mm of precipitation per year	Environment Canada Climate Normals, Thunder Bay A Station (1971 – 2000)
Evapotranspiration	m^3/yr	3.35×10^9	515 mm per year	Calculated using Thornthwaite Method
Runoff	m^3/yr	4.10×10^8	0.32 runoff coefficient (63 mm/yr)	Refer to Table 7.2 for runoff coefficient estimate
Infiltration	m^3/yr	8.70×10^8	remainder of surplus (134 mm/yr)	Water Budget Equation
Groundwater Recharge	m^3/yr	4.35×10^8	67 mm/yr	Assuming 50% of infiltration returns to surface water courses as baseflow

The analysis of the average annual water budget for the study area is essential for determining the available water for domestic, institutional, commercial, industrial, and agricultural uses. A discussion and analysis of the average annual water use and demand is provided in Section 6. The estimated total groundwater use within the study area is 6,651,550 m^3/year. Thus, based on a very conservative estimate, approximately 4.35×10^8 m^3/year of groundwater is available within the study area. Therefore, only approximately 1.5% of the available groundwater is used.

8.0 Aquifer Vulnerability Assessment

8.1 General

The potential vulnerability of an aquifer to groundwater contamination is a function of the susceptibility of its recharge area to infiltration. The groundwater vulnerability to contamination can be defined as: ***the tendency or likelihood for contaminants to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer.*** Vulnerability is not an absolute property, but a relative indication of where contamination is likely to occur; no groundwater is invulnerable. Furthermore, it may be necessary to consider long-term effects on groundwater quality, perhaps over decades, in carrying out vulnerability assessments.

Areas of high recharge are generally more vulnerable to pollution than those replenished at a slower rate. Unconfined aquifers that do not have a cover of dense material are susceptible to contamination. Fractured bedrock areas are also susceptible by providing pathways for the contaminants. Confined, deep aquifers with low permeability aquitard formations overlying them tend to be better protected.

Wells that connect two aquifers increase the chance of cross contamination between the aquifers. In addition to serving as a source of drinking water, a well can also act as a direct pathway from the land surface into the water supply. Thus, a major consideration in groundwater contamination is the position and condition of wells. Most of the contaminants that commonly cause concern originate above ground as the result of human activities.

Overburden formations generally provide primary protection against groundwater pollution. Bacteria, sediment and other insoluble forms of contamination become trapped or adsorbed within the soil pores. Some chemicals are absorbed or react chemically with various soil constituents, thereby preventing or slowing the migration of these pollutants into the groundwater. In addition, plants and soil microorganisms use some potential pollutants, such as nitrogen, as nutrients for growth, thereby depleting the amount that reaches the groundwater. These processes are known as natural attenuation processes.

These natural systems can fail if they are overloaded with pollutants. Large amounts of potential pollutants concentrated in a small area can cause localized groundwater contamination, depending on the depth and type of soil above the water table. To help protect water wells against contamination, it is important to use the natural protection that soil provides by maintaining adequate separation distances between wells and potential sources of contamination. Wellhead protection strategies should aim at mitigating or minimizing the potential for aquifer contamination through proper land use and groundwater management alternatives.

After an aquifer has been contaminated it is difficult to entirely define or remediate the impacts. It is also difficult and extremely costly, involving considerable effort and time, to clean/treat-contaminated groundwater. Even after the source of contamination has been removed, an aquifer may remain contaminated for years. Thus, it is often unfeasible to consider groundwater remediation as a solution. Prevention is the key, and prevention includes identifying the major sources of contamination, and learning to control them.

In the present study, a preliminary groundwater vulnerability assessment has been completed following the intrinsic susceptibility mapping techniques described in the TTOR (MOE, November 2001). A brief summary of the approach and the results of the groundwater vulnerability assessment, hereinafter referred to as intrinsic susceptibility assessment are included in this section.

8.2 Aquifer Vulnerability Indices Approach

The intrinsic susceptibility to contamination can be estimated by assigning numerical scores related to hydraulic conductivity (K) of the material in each layer overlying the water table (or upper most aquifer) multiplied by the thickness of that layer. In other words, the intrinsic susceptibility indices can be calculated as the sum product of the thickness of the overlying layers and their corresponding K factors (which are related to the hydraulic conductivity).

Schedule C of the TTOR (MOE, November 2001) provides a generic representative hydraulic conductivity (K-Factor). The representative K-Factors, as defined in the TTOR (MOE, November 2001), are relative numbers and do not correspond directly to exponent of the observed hydraulic conductivity values.

The aquifer sensitivity is calculated as follows:

Intrinsic Susceptibility Index (ISI) = $(K_1 \times d_1) + (K_2 \times d_2) + \ldots K_n \times d_n)$

Where:

- K_1 and d_1 are the hydraulic conductivity number and the thickness of layer one;
- K_2 and d_2 are the hydraulic conductivity and thickness of the second layer, and so on.

Based on this analysis, the higher the ISI, the less sensitive is the aquifer. Three classes of aquifer sensitivities have been identified in the TTOR. Areas with ISI > 80 may be considered as the least sensitive and areas with ISI less than 80 but greater then 30 may be classed as medium sensitivity and all areas with ISI value less than 30 are high sensitivity areas.

Figure 8.1 illustrates the intrinsic susceptibility to contamination mapping of the Thunder Bay area. In the absence of sparse well data over the Precambrian uplands, additional information with respect to the location of water table and the hydraulic characteristics were needed. For this purpose, it was considered, as discussed in Section 4.0, that the groundwater table coincides with the numerous water bodies over the uplands and the hydraulic conductivities of the upper weathered and fractured rocks are relatively high. With these assumptions, a preliminary ISI mapping of the study area was completed in July 2002. In August 2002, the MOE issued an addendum to the TTOR with respect to methods for Groundwater Intrinsic Susceptibility and water table mapping in bedrock areas. This suggested modified approach is similar to the initial mapping techniques used in the study and confirmed the approach followed in the study is correct and acceptable, both with respect to the water table mapping and the ISI mapping. The same approach was also used in the delineation of recharge/discharge areas.

As suggested in the modified approach, because of absence of wells and lack of overburden material over the bedrock areas in the north, most of the area covered by the Precambrian uplands has been assigned a highly vulnerable class of < 20. We have also used the aerial photography data, IKONOS images (where available) and the DEM data in the interpretations. The resulting map, Figure 8.1, shows the high vulnerable class over most parts of the Precambrian shield. Moderate and low vulnerability areas have been identified sparsely over the entire study area. There appears to be a higher density of medium and low vulnerability areas to the southwest of Highway 17 and less medium and low vulnerability areas to the northeast of Highway 17.

9.0 Potential Contaminant Sources Inventory and Assessment

9.1 General

In completing groundwater management studies it is critical to understand the hydrogeological setting as discussed in the previous sections, but it is also important to identify potential sources of groundwater contamination. In the present study, an inventory of the potential contaminant sources has been completed and the potential for contamination from the identified sources has been assessed in the light of the prevalent hydrogeological sensitivity in the area. In this section, a description of the potential contaminant sources inventory is included and the hydrogeological sensitivity of the area is discussed in Section 8 above.

Potential sources of contamination can be grouped into 6 categories:

- Sources designed to discharge substances: sewage systems, injection wells, septage sites and organic conditioning sites;
- Sources designed to store, treat and/or dispose of substances (discharge being through unplanned release): landfill sites, cemeteries, surface storage of hazardous products or waste, underground and above ground storage tanks (UST and AST);
- Sources designed to retain substances during transport or transmission: pipelines, materials transport;
- Sources discharging substances above and beyond required doses as a consequence of other planned activities: irrigation, application of agricultural/lawn care chemicals such as pesticides, herbicides and insecticides;
- Sources providing a conduit or inducing discharge through altered flow patterns: water supply wells and production wells and construction excavation;
- Naturally occurring sources, whose discharge is created and or exacerbated by human activity: natural leaching, groundwater surface water interactions; and

The potential contaminant sources inventory data were obtained from various sources including: the Ministry of the Environment (MOE), and the Technical Standards and Safety Authority (TSSA). The MOE maintains files and databases regarding the following sites:

- PCB storage;
- Contaminated, waste disposal;
- Organic soil conditioning;
- Septage spreading;
- Waste generators;
- Waste receivers; and
- Waste haulers.

The TSSA maintains records for all registered fuel tanks including gasoline, diesel and propane.

9.2 Potential Contaminant Sources Associated With Residential Properties

9.2.1 Fuel Tanks

Residents must be made aware of the potential contaminant sources that exist on their own property. Fuel tanks can be an issue if improperly stored or maintained. Although the fuel tanks are localized, any leaking tank(s) could impact the groundwater over a large area depending upon the hydrogeological sensitivity of the area and the groundwater use.

The municipalities should make efforts to compete a comprehensive residential survey/inventory to assess the nature and extent of various potential sources of contamination at private residences.

The residents/owners of the fuel tanks should be made aware of the risks to their well(s) and the municipal water supplies. The municipalities should develop a public education program to educate public on groundwater management and protection and what the public can do to minimize impacts to the groundwater.

9.2.2 Septic Systems

The majority of the residences, businesses, and the industries within the urbanized area are serviced by municipal utilities such as water and sewer. Outside of the fully serviced areas, residents generally rely on individual wells and septic systems. It is important to recognize that septic systems may impact groundwater quality, given that these systems potentially discharge bacteria and nitrates as well as other household chemicals (cleaning products, paints, oils and water softener backwash) into the environment.

Malfunctioning and/or improperly designed septic systems could pose a threat to groundwater quality and human health because of the potential for bacterial contamination. The potential impacts associated with a given system, however, are best addressed on a case-by-case basis, requiring site-specific studies. The residents should be made aware of potential threats to groundwater arising from the septic systems; the need for adequate setbacks between the well and disposal beds and the need for regular maintenance of the septic system.

9.3 Potential Contaminant Sources Identified from Agency Sources

The information gathered from the agency databases are discussed in detail in the following sections and the locations of the sites are presented on Figure 9.1. To ensure confidentiality of the data, as per the data sharing agreements with various agencies, the names and addresses of the property owners have been excluded from the data presented in various tables in Appendix H. However, the geographic locations, in terms of northing and easting of various potential contaminant sources, collected during the field investigations involving GPS surveys have been included in the data presented in the Appendix H and the potential contaminant sources have been plotted in Figure 9.1.

A preliminary assessment of risks of various types of contaminants was completed by assigning risks of groundwater contamination to various types of land use as detailed in the Handbook on Ground Water and Wellhead Protection (EPA, 1994) Given that this study is being completed for several communities over an extensive area, it is not possible to complete an in depth assessment of each potential source of groundwater contamination. As a result, a cursory assessment of the risks assigned to the potential sources of contamination from the above-mentioned datasets is considered adequate to guide the planners. Table H-1 (in Appendix H) is prepared as a guide. Table H-1 also includes risks associated with several land uses that are either not applicable or that were not included in the datasets reviewed. The risks associated with such land uses have been included for future reference should the need arise.

Some of the sources identified in the six categories mentioned above are considered to be point sources of contamination while others are non-point sources. It should be noted that not all potential sources of contamination have been included, given the level of detail required in this study.

9.3.1 Potential Point Sources of Contamination

Point sources of contaminations include sources associated with a specific location such as underground storage tanks, waste disposal facilities, industries, spills or abandoned wells. These sources can be plotted as discrete points on a map.

9.3.1.1 Fuel Storage and Handling Facilities

The TSSA database was searched to find all fuel storage tanks registered in the study area. Between 1971 and 1995, a total of 176 fuel tanks were registered in the study area. The TSSA database is presented in Table H-2, in Appendix H. A summary of different types of tanks registered in the TSSA database in the study area is outlined in Table 9.2.

Table 9.2 Summary Of Fuel Storage Tanks Registered In The TSSA Database

Type of Facility	Number registered in Study Area
Bulk Plant	1
Gas Station (Card/Keylock)	7
Gas Station (Full-serve)	49
Gas Station (Self-serve)	117
Marina	1
Total	**176**

As noted in the above table, the majority of the registered underground storage tanks in the study area are gasoline tanks.

9.3.1.2 Waste Disposal Facilities (Landfills)

The Ministry of the Environment maintains a database of all known active and closed landfill sites in Ontario. This includes information on transfer stations and processing locations. A waste disposal sites database is included in Table H-3, Appendix H.

9.3.1.3 Ministry of the Environment

The Ministry of the Environment maintains records of PCB storage sites, waste generators, waste haulers and sites where spills, complaints or various incidents of environmental concern have occurred. Refer to Table H-4, Appendix H for details regarding contaminated sites and spills, Table H-5 for PCB storage sites and Tables H-6, and H-7, for waste generator and waste manifest databases respectively.

Contaminated Sites and Spills Database

There are 572 entries on the MOE spills database in the study area. A majority of the contaminated sites or areas where spills occurred in the past correspond to various gas stations and industrial and commercial units in the study area. Most of the spills relate to various petroleum hydrocarbons, including fuel oil, furnace oil, hydraulic oil, diesel, gasoline, and solvents, along with some chemical spills such as glycol, caustic alkali liquid, chromate water etc. In addition, smoke and gas releases were also reported.

As the contaminant releases could adversely impact the groundwater quality, the municipalities should obtain information on any such occurrences and work with the MOE in identifying and mitigating any potential impacts to the water supply systems.

PCB Storage Sites

There are 17 sites in the study area that are registered in the MOE database of known sites where PCB containing substances are stored or used. Refer to Table H-5 for details. All of the sites are within the City of Thunder Bay. The majority of the sites relate to electrical facilities storing (or using) electrical transformers with PCB oils.

Waste Generator and Waste Haulers

All waste generators, waste receivers and waste haulers are assigned registration numbers by the Ministry of the Environment. These numbers were used to identify each site in Tables H-6 and H-7. These databases include an exhaustive list of waste generators from small commercial business and establishments to large industrial manufacturing units. A total of 577 entries were listed in the waste generator database. Of these, 466 were located within the City of Thunder Bay.

9.3.1.4 Salt Storage Facilities

Salt storage areas have historically been located at a number of sites within the study area. It is likely that past (and possibly current) storage practices have resulted in salt impacts to the groundwater in the vicinity of these storage areas.

MTO Highway Maintenance has nine patrol yards/storage yards for highway winter snow and ice control products. Table 9.3 summarizes the various locations in the study area.

Table 9.3 Summary of MTO Patrol Yards

Patrol Yard Name	Highway	Longitude	Latitude	Location	Geographic Township	Owner	Property Size (Acres)
Huronian Storage Yard	11	90.72179000	48.65897000	49.9 km west of Shebandowan	Unsurveyed Territory West of Ames Twp.	MTO	6.2876
Shabaqua Patrol Yard	11/17	89.89497222	48.59844444	Hwy 11/17 at Shabaqua, just before 11 and 17 intersection	Dawson Road Lots	MBS	4.7915
Kakabeka Falls Patrol Yard	11/17	89.60367994	48.39600050	0.8 km east of Kakabeka Falls	Paipoonge	MNR	4.3338
Dawson Road Patrol Yard	South of 102	89.37301361	48.48922972	Just south of Dawson Road on Mapleward Road	McIntyre	MBS	3.0991
Hymers Patrol Yard	588	89.69901028	48.29400750	1.6 km south of Hymers at junction of Hwys 588 and 595	Gilles	MBS (DPWO)	2.6580
Blake Patrol Yard	61	89.46709722	48.21167167	25.7 km south of Thunder Bay, 5.6 km S of Hwy 608	Blake	MBS (DPWO)	3.9437
Spruce River Road Patrol Yard	527	89.13915889	48.49909694	Just north of junction with Hwy 17	MacGregor	MBS	4.0469
Pearl Patrol Yard	11/17	88.65797222	48.66411111	In Village of Pearl (12.1 km E. of Jct. 17 and 587)	McTavish	MBS	8.4644

Source: MTO.

Township and Municipal salt storage locations are provided in table 9.4 below:

Table 9.4 Salt Storage Locations

Township/Municipality	Salt Storage Location	
Oliver Paipoonge	Municipal Garage 4 Rubin Dr., Murillo Sand & 5% salt mix	Con 1 Pt. N1/2 Lot 6 RP 55R1035 Part 1 to 3 &RP 55R9590 Part 1 PCL 15737 Conc A S/R Pt Lot 19 RP55R7797 Part 1
Conmee	salt/sand mix (no pure salt)	Twp Garage Lot 1, Concession 3
Neebing	Municipal Garage Cloud River Rd West	Con 3 SPT Lot 2 FWR448
O'Connor	Municipal garage salt/sand mix	Conc 4, Lot 6
Dorion	Response did not include salt storage info	
Gillies	Municipal Garage MTO Garage	Conc 5 South Part Lot 7 Conc 5, North Part Lot 6
Shuniah	Public Works Garage 101 Coral Bay Rd.	Being a portion of Mining Location 12 Herrick's Survey, Township of MacGregor now being the Township of Shuniah

Source: Township and Municipality staff.

9.3.1.5 Cemeteries

A total of 54 cemeteries were identified throughout the study area. Of these, we were able to obtain UTM coordinates on 24 cemeteries. The locations are plotted on Figure 9.1.

The older cemeteries present a possible source of heavy metals (arsenic) and formaldehyde contamination of soils and groundwater. This is due to the composition of the embalming fluids used many years ago. Table H-10 summarizes the cemeteries located throughout the study area.

9.3.2 Other Potential Point Sources

Some of the potential point sources of contamination such as septic systems, abandoned wells and fuel oil tanks exist throughout the study area. Therefore, they will not be addressed on an individual basis.

9.3.2.1 Abandoned Wells

Abandoned wells also have the potential to impact groundwater quality, especially if they are allowed to deteriorate and the casings corrode. Abandoned wells can provide a direct pathway for surface sources of contamination to enter the groundwater aquifer via

leakage through the casing. The potential impacts of abandoned wells are best addressed during site-specific hydrogeological investigations.

O. Reg. 903 stipulates that a well must be abandoned and plugged when:

- *A new well is dry;*
- *A well is not being used or maintained for future use;*
- *A well is producing salty, sulphurous or mineralized water or water that is undrinkable.*

The Regulation also authorizes the MOE to order a well to be plugged. The main reasons for plugging a well are to:

- *Eliminate physical hazard;*
- *Prevent groundwater contamination;*
- *Conserve the yield and maintain water levels in the aquifer;*
- *Prevent intermingling between desirable and undesirable quality waters to ensure that original subsurface conditions are restored."*

Additionally, the municipalities should encourage the mining community to properly abandon all mining/exploration holes once exploration work is completed.

9.4 Potential Non-Point Sources of Contamination

Non-point sources of contamination include sources that are associated with larger areas. Land application of herbicides and pesticides, organic soil conditioning sites, septage sites and road salting fall into this category. With proper handling, use and application procedures, these chemicals and nutrients should not impact groundwater or surface water resources. However, given that their use is not strictly regulated or controlled, it is possible that improper applications or spills have occurred as a result of routine use. Non-point sources of contamination are addressed in the following sections.

9.4.1 Pesticide Applications

Pesticides are widely used to protect crops, increase productivity and reduce labour requirements to grow crops. The major groups of pesticides include insecticides, herbicides and fungicides. Herbicides are the most widely used group of products and are the most prevalent agricultural chemicals found in surface water and groundwater receivers. These compounds can have varying fates after application. Some compounds evaporate, some breakdown into benign compounds, some bind to soil particles, and others get carried via surface water or groundwater. The end fate of a given pesticide depends of several factors such as soil characteristics, site features, pesticide properties and pesticide use practices. Hundreds of chemicals are available to control weeds, insects or various pests affecting the growth and productivity of a given crop. We understand that the types of products applied are site-specific depending on field conditions and the types of pests requiring treatment.

Pesticide application can be prevalent on residential lawns, golf courses, parks, farms, transportation corridors etc. Modern golf courses follow best management practices and apply pesticides and nutrients in doses that are just adequate for turf maintenance. Also, the golf course owners tend to optimize irrigation to control costs. However, the municipalities should insist on careful monitoring of the downgradient impacts from the golf courses to protect the groundwater resources in the area. A number of municipalities in Ontario are considering a ban on the use of pesticides and herbicides.

Forestry management initiatives such as spraying of various chemicals can be considered as a non-point source of contamination. Furthermore, clear cutting activities may also impact local water quality and quantity.

9.4.2 Lawn Care

Lawn care chemicals are similar to agricultural chemicals except that they tend to be applied in smaller quantities. Some products provide nutrients to enhance the growth of grass, shrubs, trees and flowers, while others discourage the growth of weeds or control insects. As with agricultural chemicals, there should not be impacts on groundwater quality if they are being applied properly because the plants should be using up the nutrients as quickly as they are being applied. If, however, the chemicals are improperly applied or spills occur then there is a possibility that these chemicals could be released into the subsurface. It is expected that these chemicals would be found in more populated areas, near residences, golf courses, parks and landscaped areas. A number of municipalities in Ontario are prohibiting or restricting use of lawn care chemicals and encourage use of organic substitutes.

9.4.3 Organic Soil Conditioning Sites/Septage Sites

The document "*Guidelines for the Utilization of Biosolids and Other Waste on Agricultural Land"* (MOE, OMAFRA, 1996) was developed in order to regulate the types of waste that could be applied to agricultural lands to ensure that the composition of the waste would pose minimal risk to plant growth, crop quality, public or animal health and quality of the environment. The Guideline outlines minimum separation distances to residences, wells, surface water bodies and limits application based on ground conditions (slopes, frost) and land use (grazing and crop types). As noted in Section 10, these guidelines are being revised under the recently enacted Nutrient Management Act. The potential concerns are related to bacteriological contamination, elevated nutrients and elevated heavy metals.

9.4.4 Agricultural Sites

Agriculture is limited within the study area, and is mainly comprised of cattle farms. These operations can generate large amounts of manure and as such, are potential non-point sources of nitrate impact to surface and groundwater. The municipalities should be aware of these operations, particularly in the light of the recent Nutrient Management Act.

9.4.5 Aggregate/Mining Operations

Aggregate/Mining operations have the potential to impact water quality/quantity. Operations that take place above and below the watertable can alter the groundwater flow direction and may have impacts on local water quality near the operations.

9.5 Summary of Potential Sources of Contamination

Table 9.5 provides a summary of all potential contaminant sources identified in the study area.

Table 9.5: Summary of Potential Sources of Groundwater Contamination

Potential Source of Contamination	Number	Data Source	Comments
Septic Systems	Unknown	-	Most septic tanks are not pumped on a regular basis.
Fuel Storage Tanks Bulk Plant Card Lock Full Serve Self Serve Marina	176 1 7 49 117 1	TSSA	Includes only those tanks that have been registered with the TSSA (See Table H-2).
Waste disposal sites	27 active 49 closed	MOE	Landfills are present throughout the study area (See Table H-3).
Cemeteries	54	Ontario Genealogical Society	Cemeteries are present throughout the study area (See Table H-10).
Waste Receivers	22	MOE	22 transfer stations within study area and one incineration site in Thunder Bay (See Tables H-9).
Contaminated Sites	151	MOE	Includes spills of petroleum hydrocarbon products, chemicals, smoke, gases etc (See Table H-4).
PCB Storage	17	MOE	17 sites within study area all in Thunder Bay. The majority of the sites have PCB containing electrical equipment (See Table H-5).
Waste Generators	577	MOE	Exhaustive list of waste generators from small commercial business establishments to large industrial/manufacturing units (See Table H-6).

The groundwater protection plan and the Official Plan documents should be developed giving due consideration to the potential contaminant sources identified in this section, in addition to the groundwater vulnerability of the aquifer and the municipal well capture

zones. The municipalities should maintain a current inventory of potential sources of contamination (PSOC). The PSOC inventory should be updated annually.

10.0 Review of Groundwater Management Strategies

10.1 General

A large population within the study area, especially within the urban surroundings of the City of Thunder Bay, depends on water supplies derived from Lake Superior. However, the rural residents in the unserviced areas depend on water supply from individual wells.

Groundwater protection is important to ensure safe drinking water supplies for the residents as well as to maintain and enhance the natural environment and ecological systems dependent upon groundwater and surface water interactions. Interruptions or significant modifications to either groundwater or surface water resources could not only impact the other but could lead to degradation of the environment and the dependent ecology in that area.

Recognizing these implications, Government of Ontario has proposed a watershed-based source water protection planning legislation, which is presently under public review. This section provides a general overview of general approaches to groundwater management strategies and includes a brief review of some of the approaches applied in different jurisdictions. A brief discussion on the potential implication of the proposed legislation on source water protection is also included.

The management strategies represent tools that can be used by municipalities to regulate and encourage specific land use activities to better promote groundwater protection. For example, specific land use activities in areas vulnerable to groundwater contamination could be limited to residential or open space land uses while restricting industrial activities in these areas such as fuel depots or wrecking yards. These are considered to be "**regulatory"** strategies. Other options include the promotion of best management practices, public education and financial incentives and disincentives. These are considered to be "**non regulatory"** strategies. This section of the report provides some of the tools that can be used to protect groundwater resources within the current Provincial regulatory framework. However, the information provided is only a review of potential management strategies, and municipalities should refer to Ontario's new Safe Drinking Water Act (Safe Drinking Water Act, S.O 2002, c.32) for details related to matters of treatment and distribution of drinking water. This Act is designed to expand on existing policies, and introduce new features to protect Ontario's drinking water. The proposed watershed-based source water protection planning legislation would further broaden the scope of the drinking water sources in the province.

The risks associated with land use activities combined with the vulnerability of groundwater to contamination locally should be considered in conjunction with groundwater use areas and land uses. Areas susceptible to groundwater impacts would

need to be protected; with most such land uses regulated to some extent by existing Acts and MOE regulations.

Background information including potential contaminant sources from land use types, groundwater protection fact sheets and information leaflets, and selected case studies on municipal strategies for groundwater protection are provided in Appendix I.

10.2 Regulations Related to Groundwater

The Environmental Protection Act and Ontario Water Resources Act contain the majority of regulations related either directly or indirectly to groundwater issues. The Provincial Policy Statement introduced under the Planning Act provides direction on matters related to land use planning and development. Some of the relevant regulations contained within these acts are summarized in this section along with related guidelines and associated documents. Best management practices (BMP) that have been developed jointly between the MOE and the Ontario Ministry of Agriculture and Food (OMAF) are also included here. Although BMP are not legislated documents, they can be used as a guide to determine appropriate practices that should be used for a given activity. Residents can either be encouraged to follow such practices voluntarily or bylaws can be developed to guide future activities such that groundwater resources are protected.

Protection of water resources is regulated by the Ontario Water Resources Act (1990). A Permit to Take Water (PTTW) is required under Section 34 of the Act for applicants taking more than 50,000 L/day from either a groundwater or surface water source. Details regarding specific PTTW for both groundwater and surface water users in the study area are presented and discussed in Section 6. Exceptions under the Act include water required for firefighting and livestock. The basic goal of the PTTW program is to prevent interference with other water users and provide a mechanism for corrective action should interference issues arise. Applications for PTTW are posted for public review in accordance with the Environmental Bill of Rights (EBR). The “EBR” provides a means for interested parties to review permit applications and provide comments and present concerns regarding the application prior to the permit being issued. The municipality can also specifically request that the MOE forward all PTTW in its jurisdiction for review, as well as comment on all applications being made within their jurisdiction, before the Ministry issues a permit. The MOE has been evaluating the existing PTTW process and has recently issued a draft Permit To Take Water (PTTW) Manual (December 7, 2004). Under the proposed source water protection legislation, the province would likely start charging for water taking.

The Nutrient Management Act (2002) and the corresponding regulations provide controls not only on the design, construction, maintenance and monitoring of manure storage areas and biosolids disposal areas, but also on biosolids storage and handling, as well as septage handling at the Sewage Treatment Plants (STP).
There are three main ways that the municipalities can control land uses that use water are:

- Official Plans and Official Plan Amendments;

- Zoning By-laws and Zoning By-law amendments; and
- Lot creation by subdivision or consent to sever.

Also, the municipalities may have an opportunity to review of Permit to Take Water applications for future development. The Municipality can also use a proactive approach and control future development by using some of the regulatory strategies discussed in Section 10.3. The municipality can incorporate land use controls such as minimum lot sizes, restriction of land use requiring high water use within wellhead protection areas, etc. Similarly, a site plan review process could be developed such that the responsibility is placed on the developer to prove that the development will not impact existing water use.

The proposed watershed-based source water protection planning legislation could have a major implications with regards to the water taking, usage and disposal which will indirectly influence the planning and development process within the municipalities. The proposed Source Water Protection Planning Board (SPPB) of a given watershed region, under the proposed legislation, would be responsible for developing the terms of reference for the required assessments and the design of source water protection plan. As members of the SPPB, the municipalities would have a role to play in the source water protection (both groundwater and surface water).

The Ministry of the Environment Web site (www.ene.gov.on.ca/envision/gp/index.htm) provides a complete list of publications, regulation and guidelines. Some of the documents that relate to groundwater quality and materials handling which could affect water quality are outlined below:

Guidelines:

Water Management - Policies, Guidelines, Provincial Water Quality Objectives of the Ministry of the Environment, Guideline B-1-2, (1994). This guideline outlines surface water quality criteria that protect aquatic resources.

Technical Guideline for Private Wells: Water Supply Assessment, Ontario Ministry of Environment and Energy, October 1994 (last revised August 1996). Guideline D-5-5. This guideline provides criteria for private well water supply for new developments. The minimum pumping rate and duration of pumping for testing well yields for private water supply are detailed in this guideline.

Guideline for Use at Contaminated Sites in Ontario, Ontario Ministry of Environment and Energy, revised February 1997. Guideline C-15. This guideline provides criteria that need to be met when cleaning up a contaminated site in Ontario. There are several approaches that are presented depending on the site conditions. The guideline outlines criteria depending on site sensitivity, land use and whether or not groundwater resources are used for water supply. The latter scenario is the most likely to apply in this municipality.

Ontario Drinking Water Standards: Ontario Ministry of Environment and Energy, Guideline B-5-1, August 2000 (revised January 2001). This guideline outlines the drinking water quality standards for inorganic, organic, radioactive and bacteriological parameters. The guideline includes health-related objectives as well as aesthetic objectives.

Guidelines for the Utilization of Bio-solids and Other Wastes on Agricultural Land, Ministry of Environment, Ministry of Agriculture and Food. The general purpose of this document is to *"facilitate the use of bio-solids and other waste materials on agricultural land, while protecting environmental quality, consumer and animal health, food quality bad the productivity of the land.*" The document outlines criteria that must be met before bio-solids can be considered for use on agricultural land.

Incorporation of the Reasonable Use Concept into MOEE Groundwater Management Activities Guideline B-7, April 1994. *"This guideline establishes the basis for determining the reasonable use of groundwater on property adjacent to sources of contamination and for determining the levels of contaminants discharges acceptable by the Ministry."*

Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment Guideline D-5-4. (Revised August 1996).

Registration Guidance Manual for Generators of Liquid Industrial and Hazardous Waste, December 2001. This document accompanies O. Reg. 558 (formerly O. Reg. 347)

Environmental Protection Act, R.S.O. 1990:

Toxicity Characteristic Leaching Procedure, Ontario Regulation 558, March 31, 2001. (Amends former Ontario Regulation 347)

Landfilling Sites - O.Reg.232/98, April 23, 1999

Waste Management - PCBs Regulation R.R.O. 1990, Regulation 362

Water Resources Act R.S.O. 1990:

Wells, O.Reg 903, R.R.O., 1990:
This regulation outlines requirements regarding well contractor licensing, well construction and testing, pump installation, and well abandonment.

The Gasoline Handling Act, R.S.O., 1990:

Gasoline Handling Code, Fuels Safety Branch Ministry of Consumer & Commercial Relations, January 1, 1993.

10.2.1 Best Management Practices

There is also a series of Best Management Practices that have been prepared by the Ministry of the Environment and the Ministry of Agriculture, Food and Rural Affairs related to the following activities:

- Nutrient Management Planning, 1998 Water Management, 1994;
- Water Wells, 2003;
- A First Look, Practical Solutions for Soil and Water Problems, 1988;
- Livestock and Poultry Waste Management, 1992;
- Field Crop Production;
- Horticultural Crops;
- Soil Management;
- No Till, Making it Work;
- Farm Forestry and Habitat Management; and
- Pesticide Storage Handling and Application.

10.3 Regulatory Strategies

The Planning Act (R.S.O. 1990) and the Municipal Act are the Provincial statutes that govern the responsibilities and framework within which Ontario municipalities operate. The Planning Act outlines three primary tools that a municipality can use to control existing and future land use within its jurisdiction: The Official Plan and Official Plan Amendments, Zoning By-laws and Zoning By-Law Amendments, and lot creation through either the plan of subdivision or the consent process. The Official Plan represents the general goals and philosophy of the community regarding existing and future development. In order to incorporate the community in the decision-making process, proper notification and public meetings are required under the Planning Act to change by-laws or amend official plans and endorse subdivision agreements. In the Official Plan, land use categories (residential, commercial, industrial, open space) are assigned to areas within the municipality typically shown on a Plan referred to as "Schedule A." The By-laws break down the land use categories described in the Official Plan into subcategories (rural residential, estate residential etc.) and outlines the permitted/prohibited uses, set back requirements etc. within each subcategory, making subdivision approvals site specific. A municipality can, for example, require that Environmental Impact Assessments (including hydrogeological investigations) be completed as part of the submission for draft plan approval, or for approval of an Official Plan or Zoning By-Law Amendment. These tools are discussed further in the following sections.

10.3.1 Official Plan

The goals and objectives of an Official Plan are best described in Section 16 (1) of the Planning Act as follows:

"An Official Plan,

(a) shall contain goals, objectives and policies established primarily to manage and direct physical changes and the effects on the social, economic and natural environment of the municipality or part of it, or an area that is without municipal organization; and
(b) may contain a description of the measures and procedures proposed to attain the objectives of the plan and a description of the measures and procedures for informing and obtaining the views of the public in respect of a proposed amendment to the official plan or proposed revision of the plan or in respect of a proposed zoning by law."

The goals for a municipality could easily include the protection of groundwater resources, particularly in areas of groundwater recharge, within this framework. The City of Thunder Bay's Official Plan (Section 2) speaks to the importance of placing a high priority on the protection and wise management of natural heritage features. Similar objectives are noted in the Municipality of Neebing's Working Draft Official Plan, Municipality of Oliver Paipoonge and Shuniah's Official Plan.

10.3.2 Zoning Bylaws

Zoning By-laws are commonly used throughout municipalities to control development in an orderly fashion. They have traditionally provided a means of separating incompatible land uses, such as residential, commercial and industrial. It consists of dividing the municipality into zones and applying land use regulations uniformly throughout each zone.

Section 34 of the Planning Act outlines the types of By-laws that can be passed by councils of a local municipality. Some of the types of By-laws that can be related to groundwater protection, either directly or indirectly, are listed below:

Board shall hear the appeal and the Board on the appeal has the same powers as the council has under subsection (14) and the decision of the Board shall be final.1983, c.1, s.33 (11,12).

(16) ***Offence****. – Every person who demolishes a residential property, or any portion thereof, in contravention of subsection (2) is guilty of an offence and on conviction is liable to a fine of not more than $50,000.00 for each dwelling unit contained in the residential property, the whole or any portion of which residential property has been demolished. 1983, c. 1, s. 33(13); 1989, c.72, s 56(3), s. 71, part.*

*(17) **Standards for health and safety remain in force**. – The provisions of any general special Act and any by-law passed there under respecting standards relating to the health or safety of the occupants of buildings and structures remain in full force and effect in respect of residential property situate within an area of demolition control. 1983, c.1, s.33(14).*

*(18) **Certain proceedings stayed**. – Subject to subsection (17), an application to the council for a permit to demolish any residential property operates as a stay to any proceedings that may have been initiated under by-law section 15.1 of the Building Code Act, 1992 or a predecessor thereof or under any special Act respecting maintenance or occupancy standards in respect of the residential property south to be demolished, until council disposes of the application, or where an appeal is taken under subsection (4), until the Municipal Board has heard the appeal and issued its order thereon. 1983, c.1,s 33(15); 1997, c.24, s.226 (5).*

(19) Exemption re Building Code. – Where a permit to demolish residential property is obtained under this section, it is not necessary for the holder thereof to obtain the permit mentioned in subsection 8 (1) of the Building Code Act, 1992. 1983, c. 1, s. 33(16); 1997, c.24, s. 226(6).

PART V LAND USE CONTROLS AND REPLATED ADMINISTRATION

34. (1) **Zoning by-laws**. – Zoning by-laws may be passed by the councils of local municipalities:

- **Restricting use of land**. – For prohibiting the use of land, for or except for such purposes as may be set out in the by-law within the municipality or within any defined area or areas or abutting on any defined highway or part of a highway.
- **Restricting, erecting, locating or using of buildings**. – For prohibiting the erecting, locating or using of buildings or structures or except for such purposes as may be set out in the by-law within the municipality or within any defined area or areas or upon land abutting on any defined highway or part of a highway.
- **Marshy lands, etc**. – For prohibiting the erection of any class or classes of building or structures on land that is subject to flooding or on land with steep slopes, or that is rocky, low-lying, marshy, unstable, hazardous, subject to erosion or to natural or artificial perils.
- **Contaminated lands or sensitive areas**. – For prohibiting any use of land and the erecting, locating or using of all or any class or classes of building or structures on land that is contaminated, that is a sensitive ground water recharge area or headwater area or on land that contains a sensitive aquifer.
- **Natural features and areas**. – For prohibiting any use of land and the erecting, locating or using of all or any class or classes of building or structures within any defined area or areas,
- that is a significant wildlife habitat, wetland, woodland, ravine, valley or area of natural and scientific interest,
- that is a significant corridor or shoreline of a lake, river, stream, or

- that is a significant natural corridor, feature or area.

- **Significant archaeological resources**. – For prohibiting any use of land and the erecting, locating or using of all or any class or classes of buildings or structures on land that is the site of a significant archaeological resource.
- **Construction of buildings or structures. –** For regulating the type of construction and the height, bulk, location, size, floor area, spacing, character and use of buildings or structures to be erected or located within the municipality or within any defined area or areas or upon land abutting on any defined highway or part of a highway, and the minimum frontage and depth of the parcel of land and the proportion of the area thereof that any building or structure may occupy.
- **Minimum elevation of doors, etc.** – For regulating the minimum elevation of doors, windows or other openings in buildings or structures or in any class or classes of building or structures to e erected or located within the municipality or within any defined area or areas of the municipality.
- **Loading or parking facilities.** – For requiring the owners or occupants of buildings or structures to be erected or used for a purpose named in the by-law to provide and maintain loading or parking facilities on land this is not part of a highway. 1983.c.1, s. 34(1); 1994, c. 23, s. 21 (1,2); 1996, c.4, s. 20(1-3).

(2) **Pits and quarries.** – The making, establishment or operation of a pit or quarry shall be deemed to be a use of land for the purposes of paragraph 1 of subsection (1).

(3) **Minimum area and density provisions.** – The authority to regulate provided in paragraph 4 of subsection (1) includes and, despite the decision of any court, shall be deemed always to have included the authority to regulate the minimum area of the parcel of land mentioned therein and to regulate the density of development in the municipality or in the area or areas defined in the by-law.

(4) **Interpretation**. – A trailer is defined in clause (a) of paragraph 101 of section 210 of the Municipal Act and a mobile home as defined in subsection 46(1) of this Act shall be deemed to be a building or structure for the purpose of this section.

(5) **Prohibition of use of land, etc., availability of municipal services**. – A by-law really passed under paragraph 1 or 2 of subsection (1) or a predecessor of that paragraph may

Most municipalities in Ontario already have an Official Plan as well as a Zoning By-law that govern existing and future development within it. The use of Zoning By-laws should be considered carefully prior to implementation because zoning is a primary tool for controlling development and might be difficult to implement in developed areas. Furthermore, the Planning Act specifies that land uses that were lawfully in place on the date that the Zoning by-law was issued, cannot be prevented from continuing as long as the use does not change. Municipalities should review the Official Plan and Zoning By-law in light of the information contained in this report, and make the appropriate changes where necessary.

The Planning Act provides municipalities within Ontario with the following regulatory controls:

Zoning (Section 34)

- A municipality can use its Zoning By-Law to control or direct developments in a manner that provides protection to sensitive areas, within its groundwater regime.
- Limit new uses within the identified area by identifying and only allowing those uses, which do not pose a risk to the aquifer.
- Requiring large lots so as to limit development on identified sensitive areas.

Holding Provision By-Laws (Section 36)

A municipality can protect sensitive areas through the application of a Holding Provision. The holding provision by-law would require the proponent supply a consultants report outlining how the development will deal with protecting the groundwater aquifer. The Holding Provision can be removed by City Council once it is satisfied adequate protection will be in place. Removal of the Holding Provision does not require a public hearing nor can the public appeal it.

10.3.3 Subdivision Approvals

Subdivision approvals are controlled by a municipality (where the municipality has been delegated subdivision approval authority by the Province). Where a municipality has not been delegated, this authority (such as in Shuniah and Dorion) the Province retains the approval authority with respect to subdivisions. However, they are only applicable when land is subdivided for sale or development. In order to subdivide land in Ontario, the governing municipality has to provide its "approval" for such subdivision. In order to do so the municipality can require that environmental assessments be completed to determine the potential effects of such development on the natural environment including groundwater resources. However, they are only useful for controlling future development and may not be particularly useful if the WHPA is already developed. Subdivision Approvals can be established such that they apply specifically to the wellhead protection areas, and the land use risk rating assessment included in Section 11. For example, lot sizes and open space requirements can be imposed or certain types of development can be prohibited within the WHPA.

10.3.4 Site Plan Review

A municipality can use Site Plan Review as described in Section 41 of the Planning Act to control aspects of site layout and design (i.e.; location and design of parking areas, on-site lighting, location of garbage collection facilities, landscaping details, grading and contours, etc.). In terms of considering the impacts of a proposed development on existing water use, it would be best to carry out this assessment earlier in the planning process, for example at the Official Plan Amendment or Zoning By-Law Amendment (OPA/ZBA) stage, so that a developer has the opportunity to demonstrate that a proposed land use would not negatively impact existing water use/supplies before permission for the use is given through the OPA/ZBA stage. Additionally, it may also be valuable to

consider the impacts on water at the site plan stage, particularly with regard to site grading and storm water management details.

10.3.5 Municipal Engineering Design and Operating Standards

Design standards are used to regulate the design, construction and operation of various land use activities. Design standards could, for example, require special storage facilities for salt and manure as well as hazardous chemicals. Operation standards could take the form of agricultural or industrial best management practices that could limit the threat to the environment posed by ongoing processes such as pesticide applications. Design and operating standards can be enforced through bylaws.

10.3.6 Source Prohibitions

Source prohibitions can restrict the use or storage of hazardous chemicals that are highly volatile, caustic or toxic when those chemicals have the potential to impact surface water or groundwater resources. Activities typically associated with these hazards include: Agriculture, landfills, machine shop and septic systems. The types of chemicals that could be restricted include: heavy metals, solvents, petroleum products and radioactive materials. Source prohibitions are restrictive; therefore, it would likely be best to phase in these restrictions as development proceeds.

10.3.7 Existing Regulatory Framework for the Municipalities within the Study Area

City of Thunder Bay

There are two primary planning documents that govern land use in the City of Thunder Bay:

- Thunder Bay Official Plan (1996); and
- Thunder Bay Zoning By-law.

The Official Plan is a guide to manage and direct the physical change and development of the community and the related effects on social, economic and natural environments. The policies in the Official Plan conform to the "Provincial Policy Statement." The Physical Development policies within the Plan include criteria for Natural Resources, Natural Constraints and Land Use. This Official Plan for the City of Thunder Bay was adopted by the Council of the Corporation of the City of Thunder Bay on October 10, 2000 by By-law 189-2000 and replaces the City of Thunder Bay Official Plan adopted by Council in July 1982. The Plan was approved and modified by the Deputy Minister of the Ministry of Municipal Affairs and Housing and came into force on March 8, 2002.

The Zoning By-law is the legislated control that implements the land use policies of the Official Plan. The city's Zoning By-law has received a number of amendments since its approval. A consolidation of the amendments is maintained by the City Clerk’s Office.

The Lakehead Rural Planning Board

The Lakehead Rural Planning Board is a regional planning board whose jurisdictional area is defined by the Minister of Municipal Affairs and Housing. The Planning Board's membership includes both municipal and unincorporated area representation. The Board is the approval authority for land severance and plans of subdivision for the municipalities of:

- Oliver Paipoonge;
- Neebing Municipality;
- Conmee;
- O'Connor;
- Gillies; and
- The unincorporated townships of Gorham, Ware and that portion of the Dawson Road Lots located east of the Kaministiquia River.

The Lakehead Rural Planning Board administers the Zoning By-laws for the unincorporated townships of Gorham and Ware. The Lakehead Rural Planning Board provides full planning advisory and services to the municipalities within their jurisdiction and on behalf of the province, to the unincorporated townships within their jurisdiction.

Township of Shuniah

Shuniah has adopted an Official Plan that sets out the municipalities general policies for future land use and includes the government policies and guidelines. The Official Plan was approved by the Province in August of 1996. Further, the Township has adopted an Amendment to the Official Plan, which was approved by the Province in April 2001.

Township of Dorion

Dorion is a community of approximately 382 people, located in Northern Ontario on Highway #11/17, 65 km east of Thunder Bay and 35 km west of Nipigon. Dorion is one of 19 towns and townships located in the District of Thunder Bay.

The Township of Dorion has a current Official Plan modified and given approval by the Province in January 1988. The remainder of the Official Plan was modified and approved in April 1989.

Municipality of Oliver Paipoonge

Currently, Oliver Paipoonge does have Official Plan coverage and they do have an implementing zoning by-law. In 1987, the Townships of Oliver and Paipoonge amalgamated and each had their own Official Plan. Through the preparation and approval of this Plan, the Municipality of Oliver Paipoonge will have a single, up-dated Official Plan, which conforms to the Provincial Policy Statement.

Township of Conmee

The Corporation of the Township of Conmee is located approximately 35 km west of the City of Thunder Bay. The Township is bordered by the Kaministiquia River on the east, O'Connor Township on the south, Adrian Township and Horne Township on the west, and Dawson Road Lots on the north.

The Township of Conmee's Official Plan was modified and approved by the Province of Ontario in March 1993.

Township of O'Connor

The Township of O'Connor is located within the Planning Area of the Lakehead Rural Planning Board in the District of Thunder Bay in Northwestern Ontario. O'Connor is located west and south of the City of Thunder Bay and is bordered by the Township of Gillies to the south, Paipoonge to the east, Marks to the west and by the Township of Conmee to the north.

The Township of O'Connor's Official Plan was modified and approved by the Province of Ontario in November 2001.

Township of Gillies

The Township of Gillies is located within the Planning Area of the Lakehead Rural Planning Board in the District of Thunder Bay in Northwestern Ontario. Gillies is located northwest of the Township of Neebing and is situated immediately south of the Township of O'Connor.
The Township of Gillies' Official Plan was modified and approved by the Province of Ontario in January 2002.

10.3.8 Sludge Spreading Controls

The land application of sewage sludge in Ontario is regulated by the Environmental Protection Act, specifically, Regulation 347. Regulation 347 sets out the separation distances between residences and wells and sewage sludge spreading sites. The separation distances are described in statute in order to be protective of human health. Ontario Reg. 347 is in the process of being modified and incorporated in the Nutrient Management Act.

10.4 Non-Regulatory Strategies

There are several non-regulatory strategies that can be implemented such as purchase of property or development rights, public education, waste reduction, best management practices, training, groundwater monitoring and contingency planning that can be used to minimize groundwater impacts resulting from land development.

10.4.1 Purchase of Property

Lands within wellhead protection areas (WHPA) could be purchased in order to have complete control over the use of the land. This however may not be feasible given that in some cases the wellhead protection areas can be large, and therefore prohibitively expensive. The option also exists for the municipality to purchase partial interests in property within the WHPA. The municipality can then protect the groundwater resources by restricting activities that could impact groundwater resources via conservation easements that could last indefinitely. Restrictive covenants are similar to conservation easements, in which case the land use restrictions are attached to the property title and are passed on to future landowners.

10.4.2 Public Education

Public education is a key factor in reducing the risk of groundwater contamination. If residents understand the risks associated with their actions, they can take appropriate measures to ensure that the risks are reduced. Public education can take several forms including newsletters, press releases, slide shows or videos, voluntary committees and speakers. The Ministry of the Environment already has a series of fact sheets and brochures targeting homeowners and businesses on issues related to groundwater conservation, well protection and water conservation.

The difficulty associated with increasing public awareness is reaching the target audience in a manner that it will respond to. Each municipality could include groundwater protection and conservation brochures with the tax bills or include a short article/ advertisement in the local papers.

10.4.3 Groundwater Monitoring

A groundwater-monitoring program could be developed to monitor the groundwater quality in the local aquifers. This program could be used to measure the effectiveness of source controls, measure the compliance with Ontario Drinking Water Standards and provide early warning of contaminants in the groundwater. Monitoring wells could be selected both close to existing municipal wells, and throughout the municipality to obtain a general understanding of the groundwater characteristics. For example, the Regional Municipality of Waterloo drilled wells upgradient of their municipal water supply wells, such that water quality could be monitored in the wells 2 years prior to the same water reaching the municipal well.

10.4.4 Recycling and Household Hazardous Waste Collection

The City of Thunder Bay has three recycling depots located as follows:

- Mountdale Avenue at Walsh Street, across from Westgate High School;
- Front Street between McIntryre and Van Horne Streets; and
- John Street Landfill Site, John Street Road.

Material brought to the depots is the taken to the Material Recycling Facility to be sorted and bailed before being shipped to market. Non-recyclable material and garbage must be removed and taken to the John Street Landfill.
The Household Hazardous Waste Collection depot is located at the John Street Landfill site and is open each Saturday from May through October and only accepts special residential waste such as:

- Paint;
- Insecticide;
- Drain cleaner;
- Spot remover;
- Household batteries;
- Spent fluorescent tubes;
- Oven cleaner;
- Used motor oil; and
- Empty propane tanks.

11.0 Groundwater Management and Protection Plan

In the previous sections, a discussion on the understanding of the hydrogeological conditions of the area and an inventory and assessment of potential contaminant sources, and a review of groundwater management strategies/options and regulatory framework for developing a groundwater management and protection plan have been included. In this section, potential land use risks and, in combination with the hydrogeological setting of the study area, a conceptual groundwater management and protection plan will be outlined, based on which of the municipal agencies can jointly develop appropriate management policies and actions to protect the excellent groundwater resources in the area.

11.1 Land Use Risk Rating

Groundwater management and protection plans will have to be developed based on an assessment of land use risks within the capture zones of the high capacity municipal wells. As such, the first step in developing the plan is to assess potential land use risks. The MOE has provided guidelines (TTOR, November 2001) to assess the land use risk rating, which combines the municipal capture zone analysis and the intrinsic susceptibility mapping. In this study, we have taken it a step further and included the potential contaminant sources as well in the analysis. The inclusion of the potential

contaminant sources will help identify monitoring requirements and additional investigative work that may be needed to reduce risks of groundwater contamination within the identified high-risk areas.

The MOE suggested approach involves superimposing the intrinsic susceptibility mapping over the municipal capture zones. The following table summarizes the land use risk rating as suggested in this approach (TTOR, November 2001).

Table 11.1 Land Use Risk Rating (TTOR, November 2001)

Saturated Zone Time of Travel	Groundwater Intrinsic Susceptibility (ISI) Index		
	<30	30 to 80	>80
<2	High	High	High/Moderate*
2 to 10 Years	High	Moderate	Low
10 to 25 Years	Moderate	Low	Low

Note: ******* to ensure adequate protection in the immediate vicinity of the wellhead, it is recommended that the 2 year time of travel zone be defined as high risk area regardless of ISI. Moderate risk rating may be acceptable if the ISI values significantly exceed 80 and that contaminant short-cutting paths are not present in the confining layer and policies are put in place to prohibit the creation of pathways within the two year travel zone.

In the study area, there is only one small communal well system in Rosslyn Village, located in the Municipality of Oliver Paipoonge. The modeling results and the capture zone delineation for this system are have been included in Section 5 earlier. As per the above table, all areas covered by 2-year time of travel municipal well capture zones have been marked as high land use risk areas. Areas of moderate intrinsic susceptibility values (ranging from 30 to 80) within the 10 to 25 year capture zones are designated as moderate land use risk rating.

Figure 11.1 shows the various land use risk areas within the study area. The majority of the study area is identified as high land use risk rating due to shallow bedrock and the assumption that the groundwater table is shallow and coincides with the surface of many surface water bodies (streams and ponds) in the area. Figure 11.2 shows the land use risk areas surrounding the Rosslyn wellfield. The wellfield is located within a small (approximately 0.2 sq km round in shape) area of low land use risk. There is an area of medium land use risk (approximately 1 to 1.2 sq km) surrounding the low risk land use area, which extends radially out to the north and elongates to the south along the Kaministiquia River. The rest of the area mapped on Figure 11.2 is high land use risk area.

11.2 Wellhead Protection Plan

The purpose of a wellhead protection plan (WHPP) is to protect public water supply systems using groundwater form potential sources of contamination. In preparing basic concepts of such a plan, we have reviewed a number of wellhead protection plans that have been developed in Canada and United States. The WHPP developed by Michigan Department of Environmental Quality (MDEQ), and that develop by Illinois summarize

various aspects of the program. A copy of the Michigan summary is included in Appendix K. The Government of New Brunswick has recently enacted a Wellfield Protected Area Designation Order, which describes procedures to be adopted in identifying the level of protection required surrounding the supply wells. A copy of the Guide to Understanding the Wellfield Protected Area Designation Order is included in Appendix I.

As discussed in Sections 5, 8 and 11, wellhead protection areas combine the municipal well capture zones, aquifer vulnerability (or susceptibility of the aquifers for contamination), potential contaminant sources and the current and proposed land use. The land use risk rating maps (Figures 11.1 and 11.2) provide a general guideline for the type of land use that could be permitted within the municipal well capture zones corresponding to the risk rating. However, in some areas, there could be other water users drawing large quantities of groundwater. At present, there are no regulations to impose delineation of wellhead protection areas for such supplies. In order to develop an effective groundwater management and protection plan, all wells in the area should be properly maintained and protected in order to prevent groundwater contamination.

The WHPP should be designed to address a number of issues, including:

- Delineate wellhead protection areas (WHPA);
- Identify potential sources of contamination within the wellhead protection area, and develop a contaminant inventory list;
- Develop mechanisms to minimize risks to the groundwater resource;
- Develop contingency plans for water supply emergencies;
- Identify procedures for development of new wells;
- Integrate federal, provincial, and local regulations and policies into the plan;
- Establish roles and duties of local staff;
- Secure long-term funding for the plan; and
- Provide for public (personal and agency) participation.

A WHPA is simply the area (both on the surface and subsurface) that contributes groundwater to a water supply well. In other words, WHPA is the volume of soil/geologic material that contributes groundwater to a water supply well. Thus, a hydrogeological survey is required to identify this area of influence in three dimensions. In the case of large private systems or sometimes even domestic systems, encourage the users to roughly delineate WHPA using some simple techniques – educate residents on the need for wellhead protection. An example methodology for shortcut approaches regarding the delineation of WHPA for safe drinking water is included in Appendix I.

As discussed above, the WHPP is typically based on a time-of-travel (TOT) assessment, which identifies the area supplying groundwater to the well over a given time frame, for example: 2 years, 10 years, 25 years etc. Identifying such a time-based area provides a reasonable length of time to respond to environmental issues within the wellfield protection areas, while maintaining a small enough area to be effectively managed. The Government of New Brunswick's Wellfield Protected Area Designation Order stipulates

three zones of varying protection around the municipal well(s). Copies of " A Guide to Wellfield Protected Area Designation Order" and an overview of the order the other relevant information leaflets are included in Appendix I for reference.

Once the time-of travel based municipal well capture zones have been delineated, a multi variant analysis combining the capture zones, potential contaminant sources inventory, aquifer vulnerability, land use, and the land use risks within the municipal well capture zones can be identified. The TTOR (MOE, November 2001) describes procedures for identifying the land use risk rating. The risks of existing contaminant sources can be determined depending upon the location of the potential contaminants. Once the WHPA is identified, individuals must be identified to develop and implement the associated WHPP. This typically involves developing partnerships between local, provincial and federal agencies and organizations, as groundwater moves across political boundaries. Building an effective team encompassing a wide range of individuals will ensure continuity of the program in the future.

In order to best manage a wellhead protection plan it is essential to know the potential threats to the groundwater within the protection area. Thus, one of the main components of the WHPP is the identification of potential sources of contamination within the WHPA, and development of a contaminant inventory list, as was done in Section 9.

Effective implementation of the WHPP requires mechanisms that prevent existing and potential sources of contamination from entering the groundwater and impacting water supply wells. Management strategies will thus be unique to the community and to the range of potential contaminant sources identified. Management approaches may entail a range of activities such as:

- Facility inspections;
- Land-use regulations;
- Operational policies;
- Best management practices; and
- Public information and education.

11.3 Land Use Applications and Review Policies

Strategies should be designed to minimize land use activities that pose a potential risk to the groundwater, encourage landowners to help reduce these risks and provide education to the public and business communities to emphasize their roles in the WHPP. One approach is to incorporate the WHPP into the Official Plan, which provides a mechanism for the use of local regulations to support wellhead protection. Land use application review policies have been discussed in Section 10 in detail.

11.4 Groundwater Monitoring Program

A groundwater-monitoring network should be established and a routine monitor program established to determine the trends in groundwater quality and establish early warning systems to identify any potential risks of groundwater contamination from various sources. A groundwater-monitoring program under Provincial Groundwater Monitoring Network is being established by the Lakehead Region Conservation Authority. This monitoring program should be reviewed in the light of the results presented in this report.

12.0 Implementation Plan for Groundwater Management and Protection

12.1 Understanding Basic Concepts of the Plan

All stakeholders including the Lakehead Region Conservation Authority (LRCA), City Engineering and Planning Departments, various interest groups and the general public should have an understanding of the basic principles of groundwater flow and contaminant transport to appreciate the need for the groundwater management protection. In order to implement the groundwater management plan, these stakeholders have also to understand their roles and responsibilities in ensuring the precious groundwater resource is protected. A brief discussion on possible roles of staff of local agencies for the protection of the environment in general, and water resources in particular, is included in the following text.

12.2 Roles and Responsibilities

Under the proposed watershed based source water protection program, the local Conservation Authority
[i.e. the Lakehead Region Conservation Authority (LRCA)] will likely be responsible for the development, protection and management of the water resources in the study area. The LRCA should develop a groundwater protection awareness program and ensure that the people are well informed about the importance of groundwater in maintaining the area ecology and environment.

The City of Thunder Bay Planning Department is responsible for reviewing the planning issues and should be kept informed of appropriate strategies for the protection of the groundwater resource. The City of Thunder Bay Transportation and Works Department is responsible for the design, cost control and project management of capital and miscellaneous projects in the City. They are also responsible for waste management. The Works Department is responsible for the maintenance of the roadways and in-ground storm and sanitary sewer systems.

A brief description of the current general mandate of staff of staff of various City Departments is briefly outlined and in the light of those current responsibilities, suggested roles of these departments are discussed.

12.2.1 Roles and Responsibilities of Planning Department/Division

The City of Thunder Bay Planning Division provides information and guidance to the public relative to planning related issues and is responsible for land use planning functions including updating the Official Plan and Zoning By-law, and processing amendments to these documents. The Division also processes subdivision/condominium applications and prepares and negotiates Site Plan Agreements, Development Agreements and Notification Agreements. The Committee of Adjustment falls within the Planning Division and is responsible for processing minor changes to the Zoning By-law and has the authority to grant land severance. The Planning Division's Mapping Section is responsible for maintaining the City's digital parcel, topographic and orthophoto mapping, as well as the City's air photos and municipal address database. Issues are generally directed to the committee by a resolution of Council.

The principal responsibility of the Planning Division is to draft policies to guide the development of the community and to review the development applications and site plans to identify if any Official Plan amendments are required for rezoning etc. The Planning Division monitors community change and future population and employment trends and identify socio-economic and physical implications.

The roles and responsibility of the Planning Division for the implementation of the groundwater management and protection plan should be related to their above mandate. As this division has a very important role in future development and growth of the area, and because they are knowledgeable of community development needs, the division staff should be involved in the design of the groundwater management plan to ensure that appropriate development constraints are properly defined in the future Official Plan amendments or Zoning By-laws. As such, the prime role of the Planning Division will be an involvement in the design of the management plan and required amendments to the Official Plan and subsequently review development application and monitor the growth to ensure that all aspects of the groundwater management and protection plan are followed. These responsibilities should rest with the current planning section of the Planning Division so that an effective review of the policies and required Official Plan amendments or bylaws is achieved and the City Council is appropriately advised.

12.2.2 Roles and Responsibilities of Engineering Department

Engineering staff are responsible for the design and reconstruction of municipal infrastructure such as roadways, sewers and sidewalks, provide management and cost controls to the capital and miscellaneous construction program, and provide technical support for some of the maintenance programs administered by the Transportation and Works Department and other municipal departments. The Engineering Department staff also assists the Public Works department in their review of landfill operations.

The Engineering Department is also responsible for the implementation of a corporate Geographic Information System (GIS) involving development of an electronic data filing system, which can be accessed through a special map or reference location.

Present workloads have necessitated the contracting of engineering consulting firms to assist in the preparation of design drawings, tender documents and contract administration of various Capital and Miscellaneous Construction projects.

The Transportation and Works Department is responsible for maintaining roadways, ditches, culverts, curb and gutter, and sidewalk. In-ground storm and sanitary sewer systems provide for the City's drainage and sanitation needs, which are also currently maintained by the Transportation and Works Department.

Based on the discussions with the Engineering staff, we understand that they are presently facing heavy workload and some of the engineering work is being outsourced. As such, there may not be any staff available to take up new tasks or responsibilities. However, because of their present responsibilities in the capital and miscellaneous projects and in providing technical support to the Public Works Department in waste management and addressing environmental concerns/issues in the City, the Engineering Department will have key role to play in providing design inputs to the groundwater management and protection plan and its implementation. The role of this department in the implementation of the plan would be to ensure that appropriate environmental assessments are conducted at all the identified contaminant source areas within the high and moderate land use risk zones. The Department should also ensure that the development approvals comply with the planning policies and bylaws developed with respect to groundwater management and protection in the area.

12.2.3 Roles and Responsibilities of the LRCA

The Lakehead Region Conservation Authority's (LRCA) mission is to provide stewardship in utilizing the natural land base within the Watershed. The LRCA serves the residents of the City of Thunder Bay and the nearby Townships of Conmee, Dorion, Gillies and O'Connor as well as the Municipalities of Neebing and Shuniah.
Based on the discussions with the General Manager and the Director of Technical Operations, we understand that, at this time, they have six fulltime staff. At present, the LRCA is understaffed to implement the objectives that the Province is outlining for watershed based source water protection.

As indicated above, the MOE and MNR are presently developing a watershed based source protection program under the safe water act that is under review at this time. LRCA has a potential opportunity for funding and they should further explore this possibility.

With regards to the groundwater management and protection plan, the LRCA should be involved in site plan reviews with respect to surface water and general environmental impacts. Once the watershed based source protection plans are implemented, the LRCA could take an active role in the surface water assessments and monitoring and collaborate with the local Townships and Municipalities in a groundwater monitoring program.

12.3 Provincial Groundwater Monitoring Network Program Implementation

LRCA is participating in the Provincial Groundwater Monitoring Network. Wells are used to gather water level and quality data at sites in the LRCA watershed and across the province. The Ontario Ministry of the Environment (MOE) is coordinating funding for the program. Ten new wells and two existing wells will be used for the project. LRCA has already selected the monitoring well sites in consultation with a MOE hydrogeologist. Installation of the monitoring wells will be undertaken in 2005. Long-term monitoring of the wells will be carried out to establish water quality trends over time.

12.4 Implications of the White Paper on Watershed-Based Source Protection Planning

The White Paper on Watershed-based Source Protection Planning was issued on February 12, 2004 to consult with Ontarians on the proposed approach for the development of a locally driven watershed-based source protection process. The White Paper consultation is the latest in a series of recent government actions aimed at protecting water at the source.

The White paper serves two main purposes:

- To describe the legislative framework proposed for the development and approval of source protection plans; and
- To examine ways of enhancing the management of water takings, including improvements to the Ministry's water takings program and the development of a framework that would govern how those who take water should be charged.

In conjunction with the proposed improvements to the Permit to Take Water (PTTW) program and the proposal to apply charges to certain water takings, consideration will also be given to the status of Ontario Regulation 434/03 made in December 2003 which places a one-year moratorium on the issuance of new and expanded permits to take water for certain uses such as the production of bottled water, and other uses that remove water from the watershed.

The White Paper provides information on the planning aspects of proposed source protection legislation, improvements to the Permit to Take Water program and the principles and factors related to implementing a system for charging for water takings.

The White Paper proposes:

- An approach for the development of a watershed-based source water protection program, including how stakeholders and the public will be involved at the local level;
- A legislative framework for the development and approval of source water protection plans; and

- Ways to enhance Ontario's management of water takings, including improvements to the Ministry of the Environment's water takings program.

It also puts forward factors that need to be considered in designing a system of water-taking charges. The following is a summary of the structure of the White paper:

Section one provides context for the discussion on source water protection and the government's actions on source water protection. Other work on source water protection includes:

- The establishment of the two expert committees on source protection;
- A Technical Experts Committee to develop an Ontario-based threats assessment process; and
- An Implementation Committee to engage in consultation on implementing source protection planning, including funding options.

Section two provides some background on source water protection and helps to answer some basic questions that readers may have about source water protection (e.g. what is source water protection?).

Section three discusses the proposed planning components of source water protection legislation such as the organization, preparation, roles and responsibilities, approvals and appeal process for source protection plans. Implementation aspects of source protection legislation and regulatory details will be developed once the work of the recently established multi-stakeholder Implementation Committee and Technical Experts Committee is complete.

The major components of the legislation proposed in the White Paper are:

Watershed Basis: Plans will be developed according to the watershed boundaries.

Source Protection Planning Committee (SPPC): A local multi-stakeholder SPPC will develop the draft Plan (e.g., members from municipal, Conservation Authorities, First Nations, public health, agriculture and other stakeholders). A coordinating body (i.e., the Conservation Authority Board in areas where a C.A. exists) will assist the SPPC, including its establishment.

Plan Development: Plan development will involve a technical assessment phase and management strategy phase, both will form the source protection plan.

Consultation: The SPPC will undertake a transparent local consultation process throughout the planning process to obtain local buy-in for the source protection plan.

MOE Approval: The coordinating body will recommend the Plan to the province for approval.

Appeal: limited rights of appeal will be available to challenge the approval of source water protection plans.

Section Four of the White Paper provides information on the proposed improvements to the Permit to Take Water Program. Improvements to the program may include:

- Ensuring a consistent level of stakeholder awareness and involvement;
- Improving the science to better understand the consequences of water takings through research partnerships;
- Monitoring and reporting of water use;
- Producing clear rules and procedures for making decisions on permit applications; and
- Creating incentives that promote water conservation and efficiency by all water users.

In addition, the paper identifies the key principles related to the government's intent to charge companies that remove water from the watershed for consumptive use. The paper also describes charging frameworks in other jurisdictions and highlights the factors and considerations in designing an appropriate framework for Ontario, including charge variability, frequency, and exemptions.

The White Paper builds on the recommendations of Commissioner O'Conner's Part Two Report of the Walkerton Inquiry and the framework proposed by the Advisory Committee on Watershed-based Source Protection Planning.

The Advisory Committee's Final Report was posted on the Environmental Registry for a 60-day comment period. 153 comments were received from various stakeholders and the public in response to the posting. The majority of the comments received supported the Advisory Committee's Report. Some submissions recommended areas for enhancing the source protection framework. These include: the roles and responsibilities of the conservation authorities, municipalities and the province and the composition of the Source Protection Planning Committee.

The Ministry has carefully reviewed and considered these comments to develop the White Paper, which contains a description of the planning aspects of source protection legislation. Environmental Bill of Rights (EBR) comments relating to the implementation aspects of legislation will be considered with the work of the Technical Experts Committee and the Implementation Committee on Source Protection and in other future work of the provincial ministries to develop the implementation components of legislation.

13.0 Conclusions

Based on the detailed hydrogeological characterization, aquifer delineation, municipal well capture zone analysis, aquifer intrinsic susceptibility assessment, contaminant sources inventory, and analysis of land use risk rating, the following conclusions have been drawn:

1. Precambrian metavolcanics and metasedimentary rocks underlie the majority of the area, and are intruded by felsic to mafic rocks of various compositions. The generalized stratigraphy present in the study area consists of seven major overburden types and five bedrock types.

2. The intrinsic susceptibility mapping indicated that most of the area is covered with a thin overburden or exposed bedrock, where the water table is expected to be shallow and the aquifer is susceptible for contamination. The high to moderate sensitivity area also includes the area covered by surficial sand and gravel deposits, which are identified as “recharge areas”.

3. Time related capture zones for the Roslynn Village wells were delineated using a 3-D groundwater modelling techniques and indicate that the principal recharge areas for the wells are as shown on the respective maps.

4. The potential sources of contamination inventory identified a number of potential contaminant sources, mainly concentrated within the City of Thunder Bay core and urbanized areas along major transportation corridors.

5. Land use risk rating analysis identified that the areas within 2-year time of travel (TOT) capture zones are vulnerable and the areas within 10 to 25 year TOT were identified as moderately risky.

6. Given the size of the study area and the population distribution, data gaps are inevitable. This study is the first of its kind in the area and represents an amalgamation of a number of data sources from existing databases. Recommendations are provided in the following section to address this issue.

14.0 Recommendations

1. The Rosslyn Village WHPA delineations should be included in the Municipality of Oliver-Paipoonge Official Plan, such that certain land use/activities are restricted within groundwater capture zones as per land use risk rating. Effective land use policies are essential to ensure that future development does not reduce groundwater recharge, deteriorate groundwater quality or deplete groundwater resources.

2. The Municipality of Oliver-Paipoonge should install upgradient groundwater quality monitoring wells for the Rosslyn municipal wellfield. This will permit the municipality to assess quality of groundwater moving towards the municipal wellfield.

3. A staff member from LRCA should be identified to coordinate and implement future groundwater protection/management programs and initiatives (community awareness and public education, etc.).

4. Due to the number of private wells and septic systems in the study area, the goals and objectives that embody wellhead and groundwater protection must be communicated to the citizens in the study area. Individuals must realize that they have an important role to play in ensuring that their well and septic system are in compliance with all relevant regulations. This can only be accomplished through the delivery of a comprehensive community awareness/education campaign. The LRCA should take the lead to assemble a task force of partners with local representation, and proceed with the implementation of such a program.

5. The groundwater management and protection plan included in this report can serve as a basis for identifying and developing appropriate groundwater protection strategies for each community and/or municipality.

6. Local municipalities and Townships should agree on a process whereby new hydrogeological data (or other relevant information), which becomes available through detailed site investigations (or similar studies) can be incorporated into this study. Updates/revisions to the mapping should be carried out on a periodic basis. This will allow the information compiled in this study to become a “living document” as new information becomes available. The partner municipalities, LRCA and the MOE need to ensure that there is a clearly defined “guardian” of the data, who is prepared and capable of ensuring that the data are kept up to date.

7. Some suggested approaches and Best Management Practices (BMP) have been included in this report and should be further explored and implemented, particularly in those areas where groundwater is susceptible to surface sources of contamination.

8. A long-term groundwater-monitoring program should be developed in the study area to resolve data gaps noted in this study. The program should be developed in consultation with all area Townships and Municipalities and the LRCA, who are

coordinating new monitoring well installations as part of the Provincial Groundwater Monitoring Network. The groundwater monitoring program should be designed to address:

- Water quality concerns in the communities experiencing development pressure (e.g. Kakabeka, Rosslyn Village, Murillo);
- Water quality and quantity concerns in the Slate River Valley; and
- Potential impacts associated with road salting activities throughout the study area.

9. It should be noted that this groundwater study is completed on a regional scale and local scale hydrogeological and other site assessments will be required for consideration of future development and/or changes in land use activities in any given area.

10. Finally, we recommend that this report be considered as a basis for the development of a comprehensive groundwater source protection plan and for future planning initiatives for the collective study area.

The above report and the contained analysis have been completed in accordance with the Technical Terms of Reference for Groundwater studies 2001/2002 (MOE, November 2001). Any deviations from the TTOR have been identified in the report.

On behalf of the study team, we trust the results presented in this report and the conclusions drawn from the analysis adequately address the issues raised in the request for proposal as per our proposal for this study.

Respectfully Submitted,

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Reviewed by:

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Peter B. Duckworth, Ph.D., P.Geo.
Principal Geoscientist

15.0 Bibliography

Anderson, M.P., and W.W. Woessner, 1992. *Applied Groundwater Modelling*, Academic Press, Inc, San Diego, CA.

Agriculture and Agri-Food Canada, 1997 "Best Management Practices, Water Wells," Ontario Ministry of Agriculture, Food and Rural Affairs.

City of Thunder Bay Official Plan, March 8, 2002.

City of Thunder Bay, Zoning By-law 177-1983.

Domenico and Schwartz 1998, Physical and Chemical Hydrogeology, John Wiley and Sons, New York.

Guiguer, N., and T. Franz, 1999. *User's Manual for Visual MODFLOW*, Waterloo Hydrogeologic, Inc. Waterloo, Ontario.

Hydrology Consultants, 1984. Report on Groundwater Conditions in Vicinity of Arthur Bog Township of Paipoonge, Lakehead Region Conservation Authority. (Hydrology Consultants, 1984).

Official Plan for the Townships of Gorham, Ware, Pearson and Scoble and the Dawson Road Lots, Lots 1 – 20 Concession A and B, East of the Kaministiquia River, Lakehead Rural Planning Board, March 6, 1997.

Ontario Department of Mines. Geological Compilation Series Map 2065; Atikokan – Lakehead Sheet; Kenora, Rainy River and Thunder Bay Districts. 1:253,440 (1 inch to 4 miles) (Geological Compilation Series Map 2065).

Ontario Department of Mines. Geological Compilation Series Map 2232; Nipigon – Schrebier Sheet; Thunder Bay District. 1:253,440 (1 inch to 4 miles) (Geological Compilation Series Map 2232).

Ontario Division of Mines, 1973. Preliminary Map P817 Geological Series, Quaternary Geology and Industrial Mineral Resources of the City of Thunder Bay, District of Thunder Bay. 1:50,000.

Ontario Geological Survey Report GR164, 1977. Quaternary Geology of the City of Thunder Bay and Vicinity, District of Thunder Bay. Accompanying Map 2372. (Ontario Geological Survey Report GR164, 1977).

Ontario Geological Survey, Northern Ontario Engineering Geology Terrain Study 57, 1981. Kaministikwia Area (NTS 52A/NW) District of Thunder Bay. (Northern Ontario Engineering Geology Terrain Study 57).

Ontario Geological Survey, Northern Ontario Engineering Geology Terrain Study 58, 1981. Black Bay Area (NTS 52A/NE and part of NTS 52A/SE) District of Thunder Bay. (Northern Ontario Engineering Geology Terrain Study 58).

Ontario Geological Survey, Northern Ontario Engineering Geology Terrain Study 71, 1983. Thunder Bay Area (NTS 52A/SW) District of Thunder Bay. (Northern Ontario Engineering Geology Terrain Study 71).

Ontario Ministry of Agriculture and Food 2002, Nutrient Management Act S. O. 2002.

Ontario Ministry of the Environment, 2002 Safe Drinking Water Act S.O. 2002.

Ontario Ministry of the Environment 2001, Technical Terms of Reference Groundwater Studies.

Ontario Ministry of the Environment 1990, Water Resources Act R.S.O 1990
Ontario Ministry of Natural Resources, 1976. Ontario Geological Survey Map 2372, Thunder Bay, Thunder Bay District Quaternary Geology; 1:50,000. (Ontario Geological Survey Map 2372).

Ontario Ministry of Natural Resources, 1980. Ontario Geological Survey Preliminary Map 2203, Quaternary Geology of Onion Lake - Sunshine Area, District of Thunder Bay; 1:50,000. (Ontario Geological Survey Map 2203).

Ontario Ministry of Natural Resources, 1982. Thunder Bay District Land Use Plan, Background Information, North Central Region (Ontario Ministry of Natural Resources, 1982).

Ontario Ministry of the Environment, Ministry of Agriculture Food and Rural Affairs, 1996 "*Guideline for the Utilization of Biosolids and other wastes on Agricultural Lands.*

Ontario Ministry of Municipal Affairs and Housing, 1990 Planning Act R.S.O 1990.

Ontario Ministry of Transportation, 1995- 1997: Drainage Management Manual (original source: American Society of Civil Engineers, ASCE (1960), US Department of Agriculture (1972).

Ontario Power Generation /MNR 2004, Kaministiquia River Water Management Plan.

James F. MacLaren Limited, 1970. Report on a Water Use Study for the Lakehead Region Conservation Authority. (James F. MacLaren Limited, 1970).

Lakehead Region Conservation Authority, 1982. Watershed Inventory. (Lakehead Region Conservation Authority, 1982).

McDonald, M.G., and A.W. Harbaugh, 1988. *A Modular Three-Dimensional Finite-Difference Groundwater Flow Model*. United States Geological Survey, Reston, Virginia, 22092.

Morton, Dodds and Partners, 1975. Report on the Results of a Detailed Analysis of the Physical Terrain Aspects of a Planning Area Located to the North of Highway 17 and to the West of the Thunder Bay Expressway in the City of Thunder Bay, Ontario. (Morton, Dodds and Partners, 1975).

The Corporation of the Municipality of Neebing Official Plan (June 1989).

Municipality of Oliver Paipoonge, Official Plan. (Draft - Feb 2001 to Dec 2001)
Pollock, D.W., 1994, User's Guide for MODPATH/MODPATH, Version 3: A particle tracking post-processing package for MODFLOW, the U.S. Geological Survey finite difference ground-water flow model. United States Geological Survey Open-File Report 94-464, Reston, Virginia, 22092.

Thornthwaite 1948. An approach toward a classification of climate. Geographic Review, 38:55-94.

Township of Conmee, Official Plan.

Township of Gillies, Official Plan (September 2000).

Township of O'Connor, Official Plan.

Township of Oliver, Official Plan (May 1986).

Township of Shuniah Official Plan (August 1996).

Township of Shuniah, Zoning By-law No. 2038-00.

United States Environmental Protection Agency 1994, Handbook-Groundwater and Wellhead Protection.

Waters Environmental Geosciences Ltd. Hydrogeological Investigation and GUDI Assessment. Municipality of Oliver-Paipoonge Well Supply Rosslyn, Ontario, March 2

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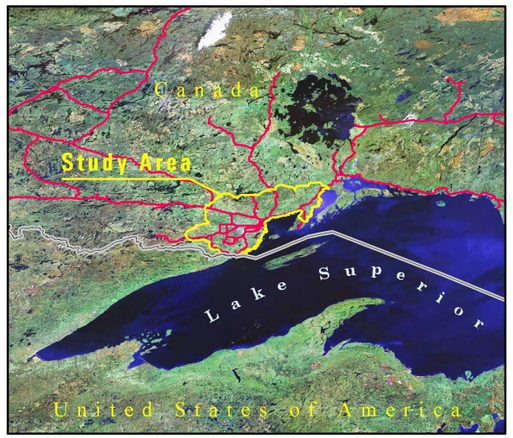
FIGURES

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Plan

FIGURE 1.1

Study Area



The study area depicted includes areas managed by the Lakehead Region Conservation Authority plus an additional 5 km buffer zone (excluding the Fort William First Nation and the State of Minnesota). The total area is 6,500 Square Kilometres (650,000 Hectares or 1,606,184 Acres)

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Earth Satellite Corp. via the Environmental Systems Research Institute (ESRI).

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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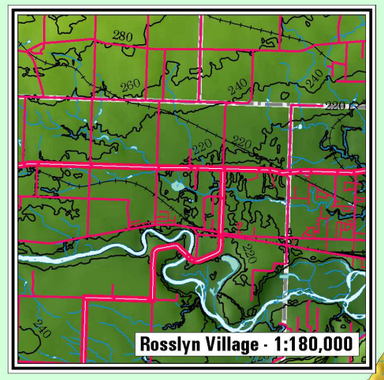
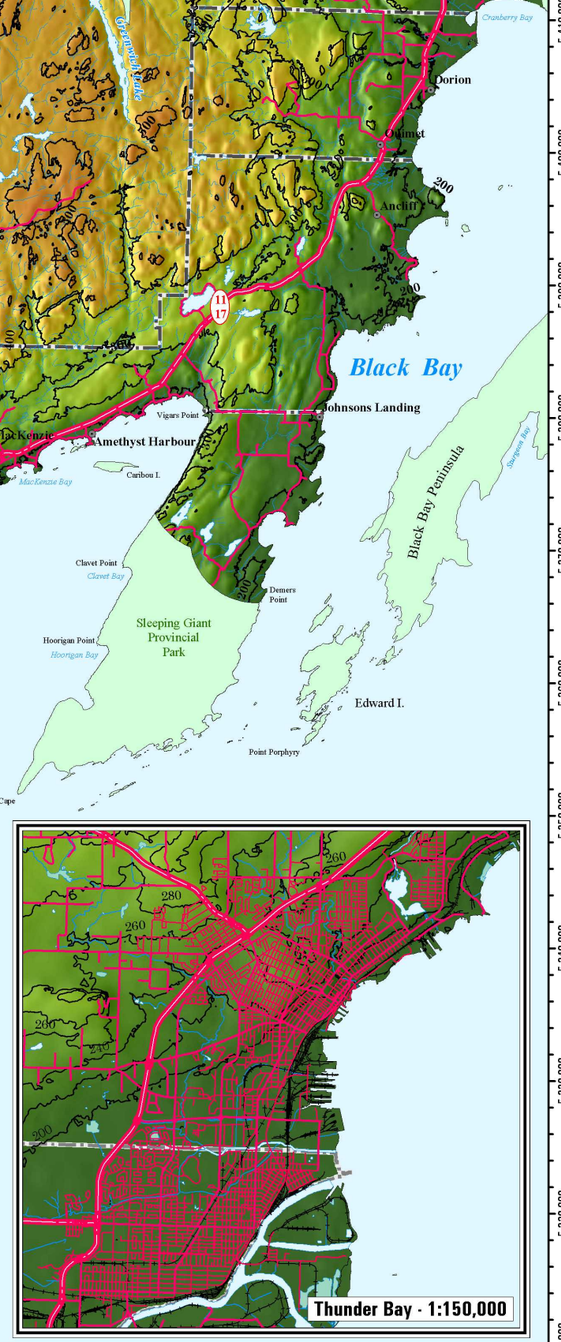
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 2.1

Ground Surface Elevation





- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Inset Maps Only)
- Elevation Contour
- River / Stream
- Rail (Inset Maps Only)
- Municipal Boundary
- Wetland (Inset Maps Only)
- Water Feature
- Non Study Area (Ontario)
- Non Study Area (Minnesota)

Surface Elevation (Metres Above Mean Sea Level)

- 700
- 679 Highest Elevation shown on Map
- 600
- 500
- 400
- 300
- 200
- 183 Elevation of Lake Superior
- 100

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
24 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

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Burnside: HA034966

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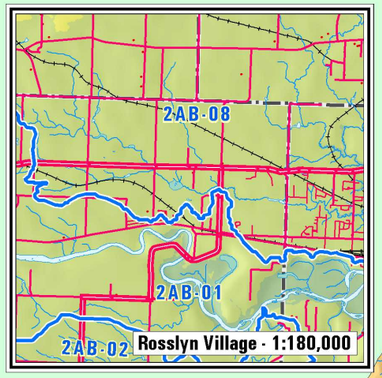
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 2.2

Subwatersheds



- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Inset Maps Only)
- River / Stream
- 2 AC - 07 Subwatershed ID (Ministry of Natural Resources)
- Subwatershed Boundary
- Rail (Inset Maps Only)
- Municipal Boundary
- Wetland (Inset Maps Only)
- Water Feature
- Non Study Area (Ontario)
- Non Study Area (Minnesota)

Elevation (Metres Above Sea Level)

- < 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- > 600

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

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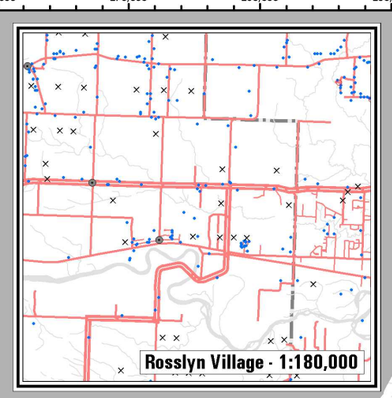
AMEC: TC035044
Burnside: HA034966

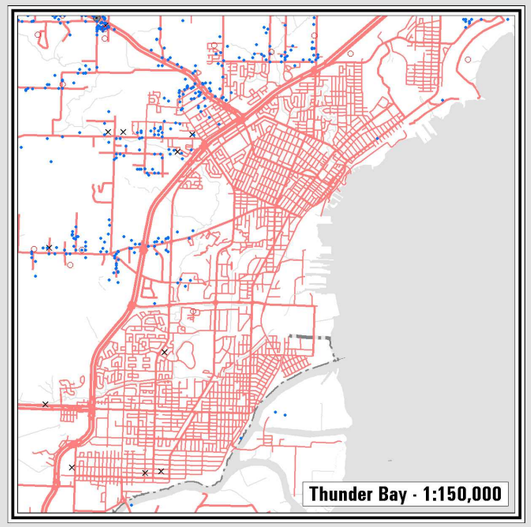
L:\HA034966\Map\Cartography\Fig_2_2_Sub_Watersheds.mxd

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 3.1

Well Location Reliability





- Well (Low Locational Reliability)
- Well Used In Analysis (Medium Locational Reliability)
- Well (Unknown Locational Reliability)
- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Inset Maps Only)
- River / Stream
- Rail (Inset Maps Only)
- Municipal Boundary
- Water Feature
- Non Study Area
- Non Study Area (Minnesota)

MOE Borehole Locational Reliability Code

1 - margin of error : < 3 m
2 - margin of error : 3 - 10m
3 - margin of error : 10 - 30m
4 - margin of error : 30 - 100m
5 - margin of error : 100 - 300m
6 - margin of error : 300 - 1000m
7 - margin of error : 1000 - 3000m
8 - margin of error : 3000 - 10,000m
9 - margin of error : Unknown

MOE Borehole Elevation Reliability Code

1 - 1 ft - Surveyed in field from known Bench Mark
2 - 5 ft - Surveyed in field from known Bench Mark
3 - 10 ft - Surveyed in field from known Bench Mark
4 - Read from topographic map, contour interval - 10 ft
5 - Read from topographic map, contour interval - 25 ft
6 - Read from topographic map, contour interval - 50 ft
7 - Read from topographic map, contour interval - 100 ft
8 - Contours crowded
9 - Unknown elevation

Well reliability classifications were based on the MOE Borehole Locational Reliability Code only. The elevation of the wells used for analysis purposes were taken from the digital elevation model. Only wells with a medium classification (reliability code 4, 5, 6) were used for the analysis in this study. No wells in the study area had reliability codes of 1,2, or 3.

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

L:\HA034966\Map\Cartography\Fig_3_1_Well_Location_Reliability.mxd

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4.1

Bedrock Geology

- Village / Hamlet
- Expressway / Highway
- Collector Road
- Fault
- Municipal Boundary
- Water Feature
- Non Study Area (Ontario)
- Non Study Area (Minnesota)

Bedrock Units

- 31b: Pigeon River and Pukaskwa swarms: diabase dikes
- 31a: Logan and Nipigon sills (1109 Ma): diabase sills
- 31: Mafic and related intrusive rocks (Keweenawan age)
- 28: Sibley Group
- 27: Felsic intrusive rocks
- 22a: Animikie Gp.: wacke, shale, iron formation, limestone, minor volcanic rocks
- 15: Massive granodiorite to granite
- 14: Diorite-monzodiorite-granodiorite suite
- 13: Muscovite-bearing granitic rock
- 12: Foliated tonalite suite
- 11: Gneissic tonalite suite
- 10: Mafic and ultramafic rocks
- 09: Coarse clastic metasedimentary rocks
- 07a: Paragneisses and migmatites
- 07: Metasedimentary rocks
- 06: Felsic to intermediate metavolcanic rocks
- 05a: Andesitic flows, tuffs and breccias with minor rhyolites
- 04: Mafic to ultramafic metavolcanic rocks
- IF: Iron formation

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
24 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

L:\HA034966\Map\Cartography\Fig_4_1_Bedrock_Geology.mxd

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4.2

Bedrock Surface Elevation

Rosslyn Village - 1:180,000

Thunder Bay - 1:150,000

- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Inset Maps Only)
- River / Stream
- Bedrock Surface Contour (Main Map Int. 50m, Inset Map Int. 10m)
- Rail (Inset Maps Only)
- Municipal Boundary
- Wetland (Inset Maps Only)
- Water Feature
- Non Study Area (Ontario)
- Non Study Area (Minnesota)

Bedrock Surface Elevation (Metres Above Mean Sea Level)

- 600 (Approximate Highest Elevation)
- 550
- 500
- 450
- 400
- 350
- 300
- 250
- 200
- 183 Lake Superior
- 150
- 145 (Approximate Lowest Elevation)
- 100

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
24 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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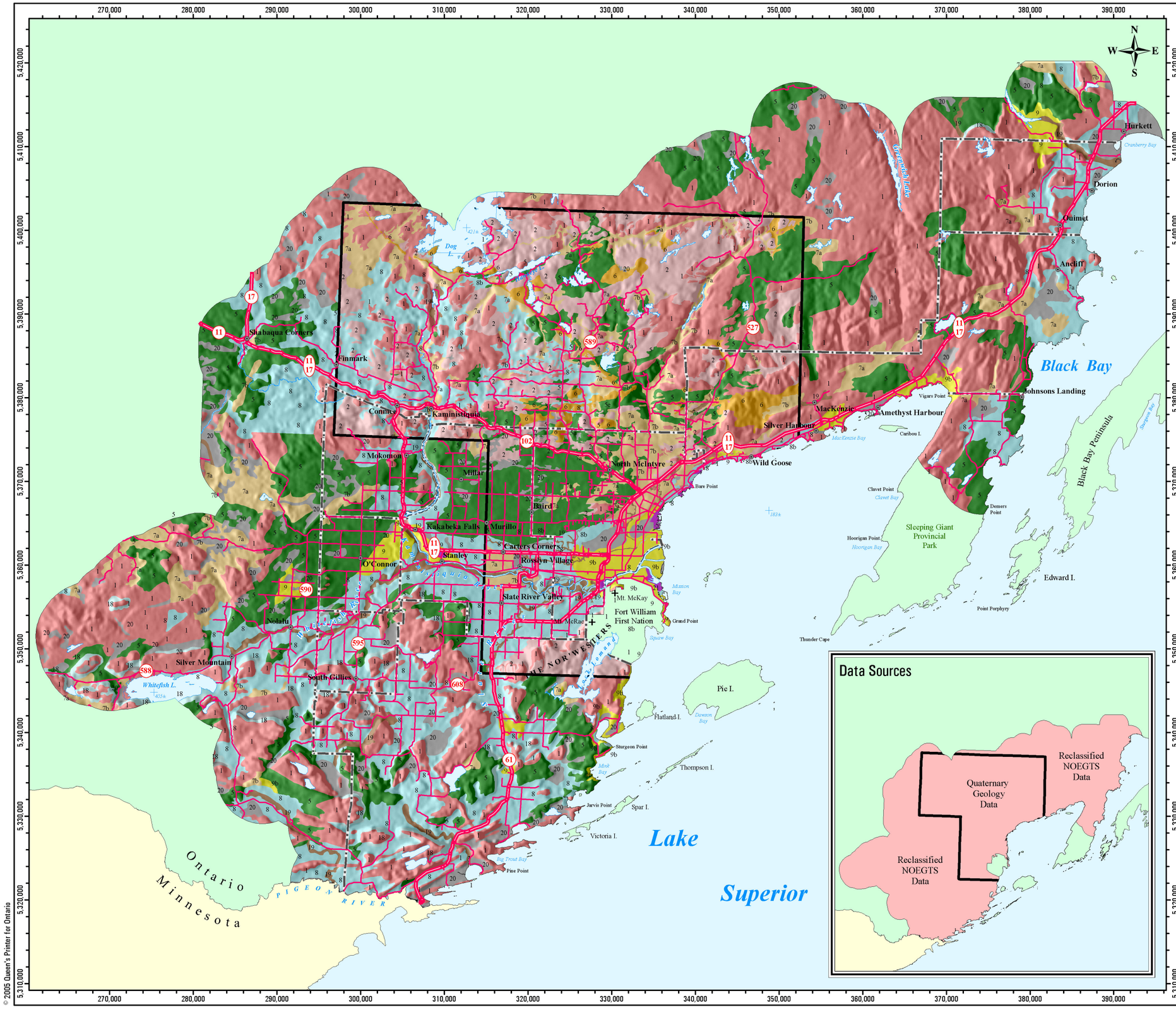
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4.3

Quaternary Geology



This figure is a compilation of different data sources. Quaternary Geology data has been combined with NOEGTS (Northern Ontario Engineering Geology Terrain Study) data to create a map representing the Quaternary Geology for the entire study area. The thick black line on the map shows the outer boundaries of the actual Quaternary Geology data. NOEGTS data has been reclassified to match the Quaternary Geology classifications as close as possible.

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

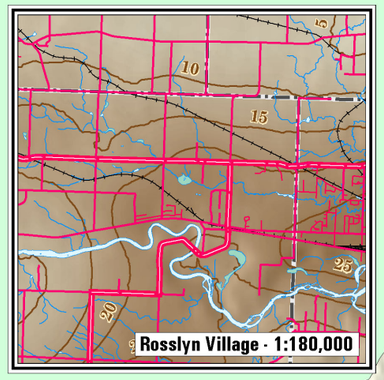
AMEC: TC035044
Burnside: HA034966

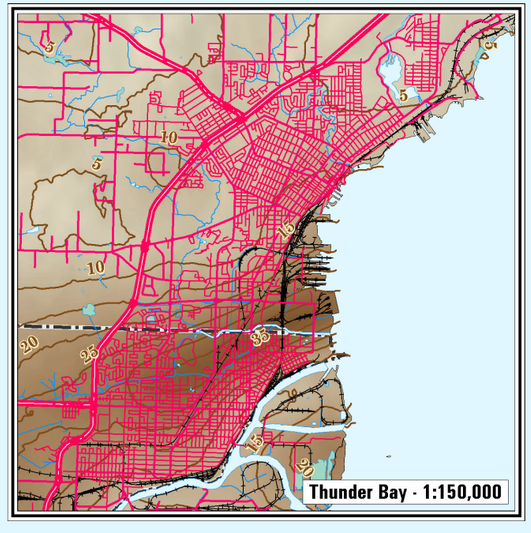
L:\HA034966\Map\Cartography\Fig_4_3_Quaternary_Geology.mxd

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4.4

Overburden Thickness





Village / Hamlet
Expressway / Highway
Collector Road
Local Road (Inset Maps Only)
River / Stream
Overburden Thickness Contour
Rail (Inset Maps Only)
Municipal Boundary
Wetland (Inset Maps Only)
Water Feature
Non Study Area (Ontario)
Non Study Area (Minnesota)

Overburden Thickness (Metres Thick)

40
35
30
25
20
15
10
5
0 - Very Thin Veneer

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
24 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

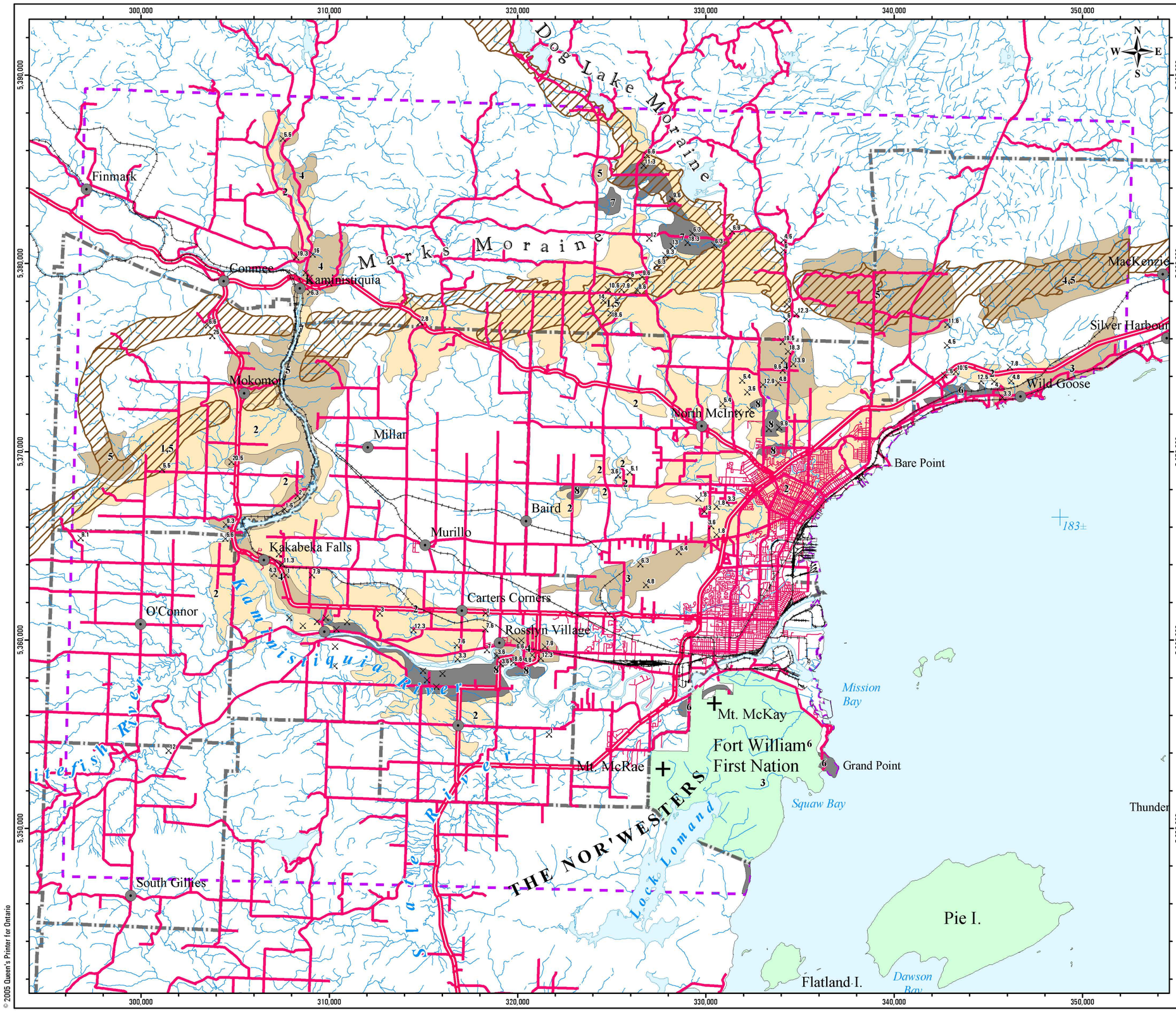
AMEC: TC035044
Burnside: HA034966

L:\HA034966\Map\Cartography\Fig_4_4_Overburden_Thickness.mxd

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4.5

Sand & Gravel Deposits



- Pit (See Notes Below)
- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Municipal Boundary
- Wetland
- Water Feature
- Non Study Area
- Moraine

Sand and Gravel Deposits

6	Predominately Gravel - Shore Gravel & Sand
7	Predominately Gravel - Deltaic Gravel & Sand
8	Predominately Gravel - Outwash Gravel & Sand
3	Mixed Sand & Gravel - Shore Sand
4	Mixed Sand & Gravel - Outwash Sand
4,5	Mixed Sand & Gravel - Outwash Sand, Ice-Contact Stratified Drift
5	Mixed Sand & Gravel - Ice-Contact Stratified Drift
1,5	Predominately Sand - Till, Ice-Contact Stratified Drift
2	Predominately Sand - Outwash Sand
7	Predominately Sand - Deltaic Gravel & Sand

- Limit of Data for Sand & Gravel Deposits

Sand & Gravel data used for this was map compiled from the Ontario Geologic Survey Report GR164 (1977). Potential deposit thicknesses indicated are represented by the Minimum Overburden Thickness value for selected Sand & Gravel pits.

Reference Figure 4.3 Quaternary Geology for sand and gravel deposits outside of this map area.

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, and the City of Thunder Bay.

0 2.5 5 10
Kilometers

1:200,000
27 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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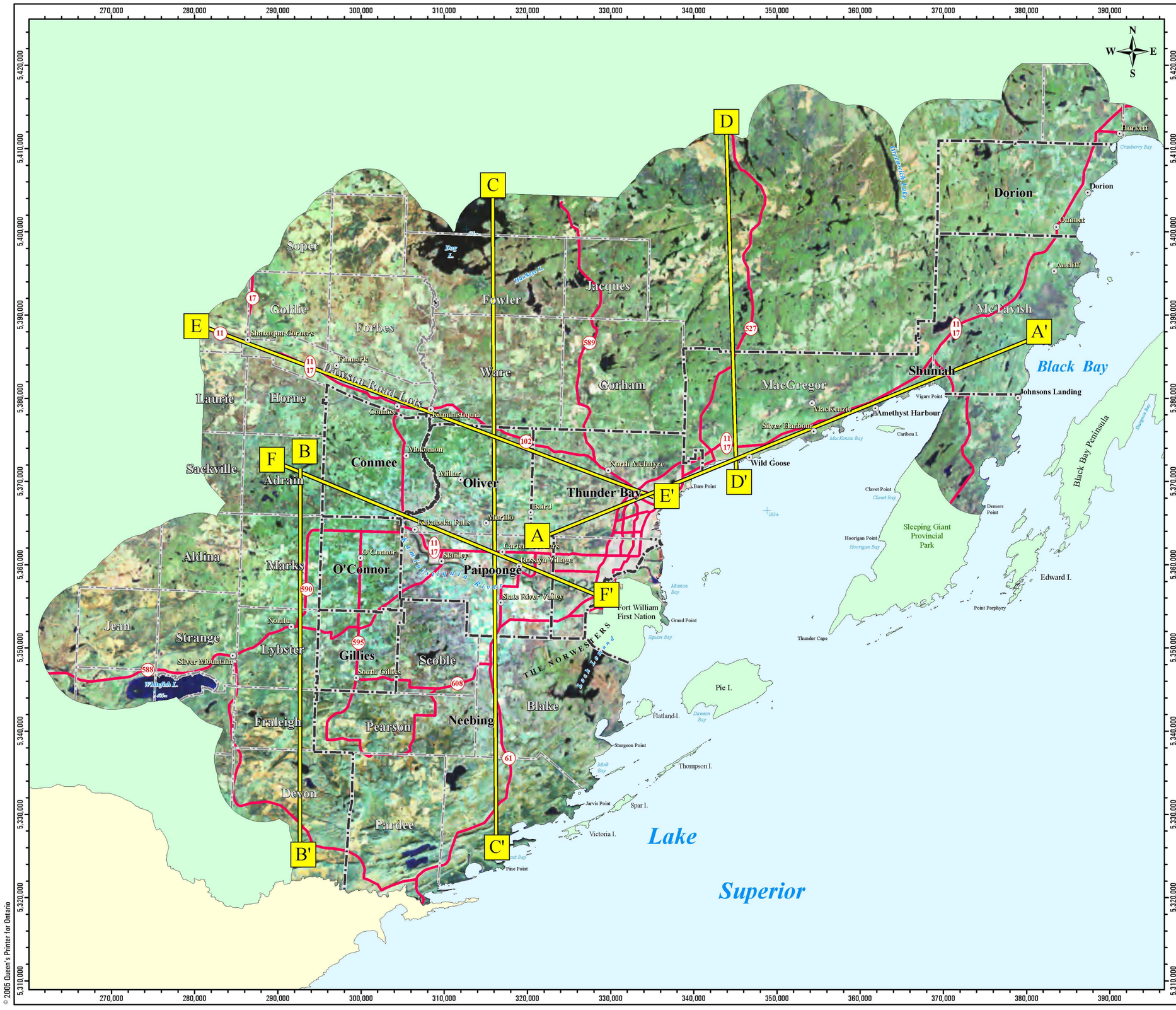
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Plan

FIGURE 4.6

Cross Sections



Village / Hamlet

Highway

Municipal Boundary

Old Municipal / Township Boundary

Non Study Area (Ontario)

Non Study Area (Minnesota)

A — A' Cross Section Location

Reference Figures 4.7 to 4.12 (Cross Sections).

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Earth Satellite Corp. via the Environmental Systems Research Institute (ESRI).

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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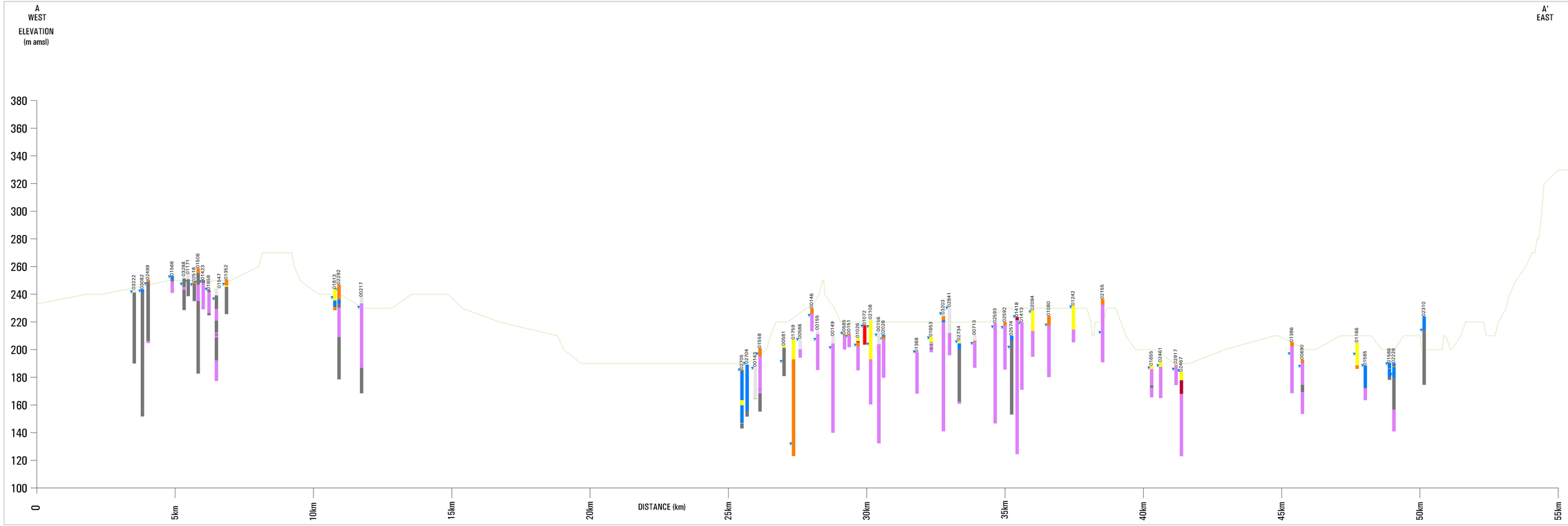


Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

Figure 4.7
Cross-Section A-A'

Legend

02310 — MOE Water Well Record Number

Lithology

- Fill
- Clay, Silty Clay
- Silt, Sandy Silt, Clayey Silt
- Sand, Silty Sand
- Gravel, Gravelly Sand
- Diamiction (Till)
- Limestone
- Rock
- Shale

Surfaces

- Interpreted Ground Surface
- Static Water Level

See Figure 4.6 for Cross-Section Location

This figures is to be read in conjunction with the accompanying report. References should also be made to the metadata completed for the study. This map provides valuable information for regional scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Vertical Scale 1:1,500
Horizontal Scale 1:75,000
Vertical Exaggeration 50x

July 2005

Prepared by: M. Dickie and C. Reynolds

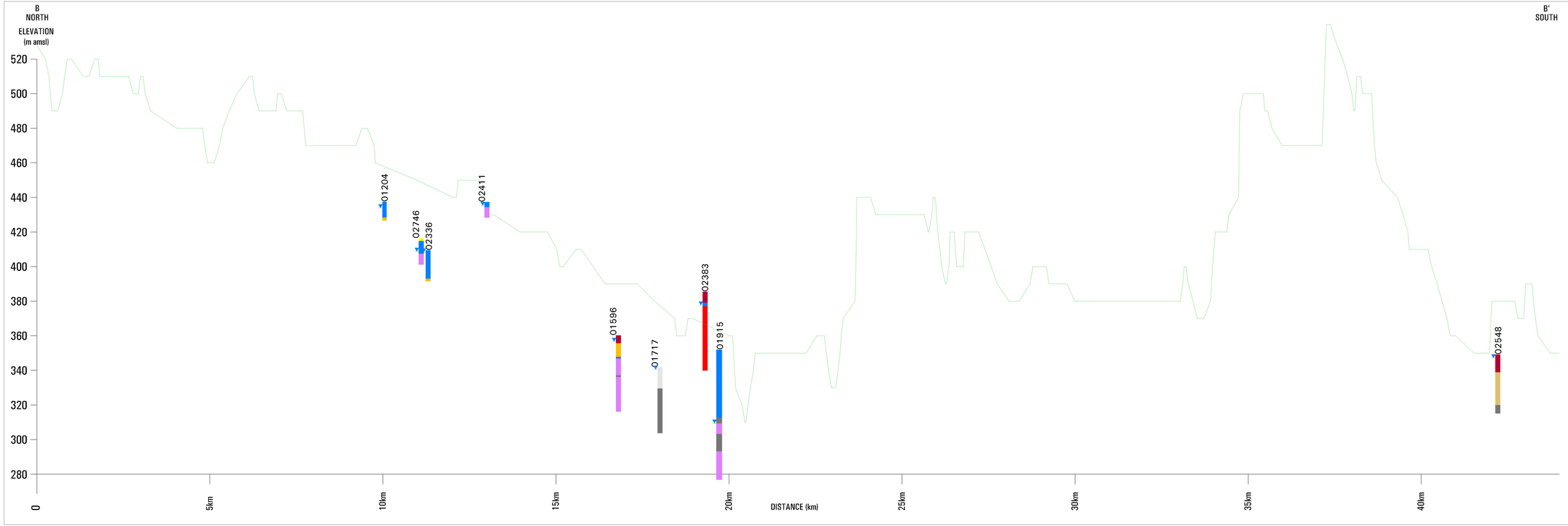
Verified by: P. Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

XREF:

HA034966 XSA.DWG



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

Figure 4.8
Cross Section B-B'

Legend

02548 MOE Water Well Record Number

Lithology

- Fill
- Clay, Silty Clay
- Silt, Sandy Silt, Clayey Silt
- Sand, Silty Sand
- Gravel, Gravelly Sand
- Diamiction (Till)
- Limestone
- Rock
- Shale

Surfaces

- Interpreted Ground Surface
- Static Water Level

See Figure 4.6 for Cross-Section Location

This figures is to be read in conjunction with the accompanying report. References should also be made to the metadata completed for the study. This map provides valuable information for regional scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Vertical Scale 1:1,200
Horizontal Scale 1:60,000
Vertical Exaggeration 50x

July 2005

Prepared by: M. Dickie and C. Reynolds

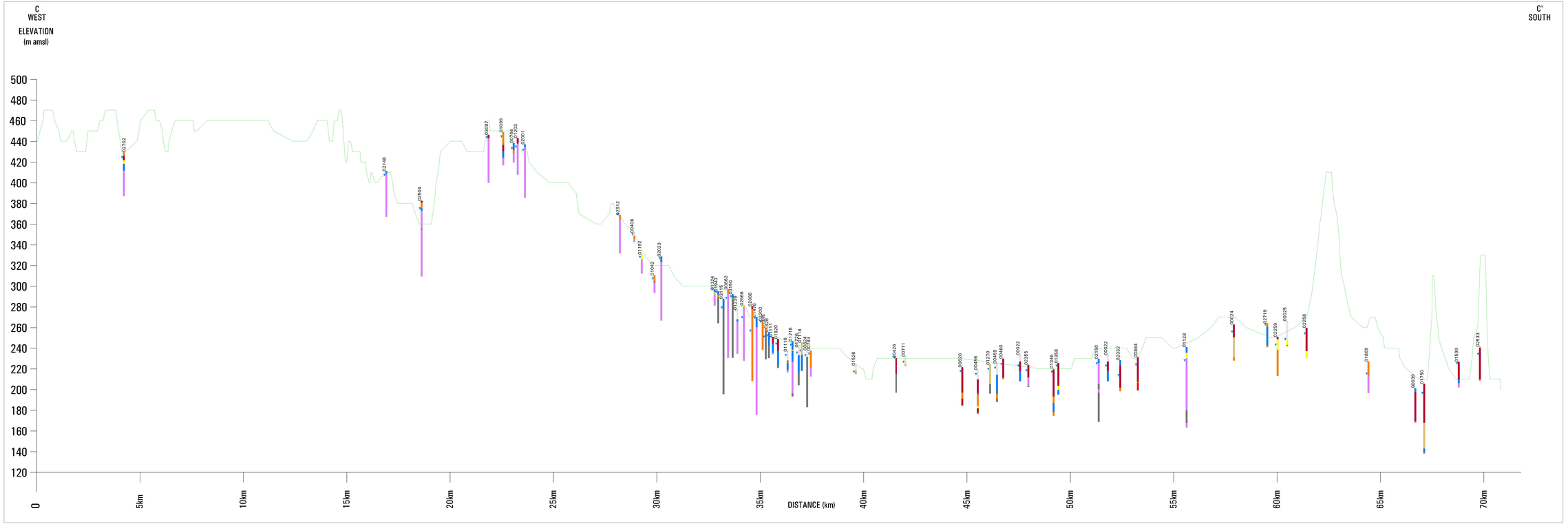
Verified by: P. Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

XREF:

HA034966 XSB.DWG



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

Figure 4.9
Cross-Section C-C'

Legend

01599 MOE Water Well Record Number

Lithology

- Fill
- Clay, Silty Clay
- Silt, Sandy Silt, Clayey Silt
- Sand, Silty Sand
- Gravel, Gravelly Sand
- Diamiction (Till)
- Limestone
- Rock
- Shale

Surfaces

- Interpreted Ground Surface
- Static Water Level

See Figure 4.6 for Cross-Section Location

This figures is to be read in conjunction with the accompanying report. References should also be made to the metadata completed for the study. This map provides valuable information for regional scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Vertical Scale 1:2,000
Horizontal Scale 1:100,000
Vertical Exaggeration 50x

July 2005

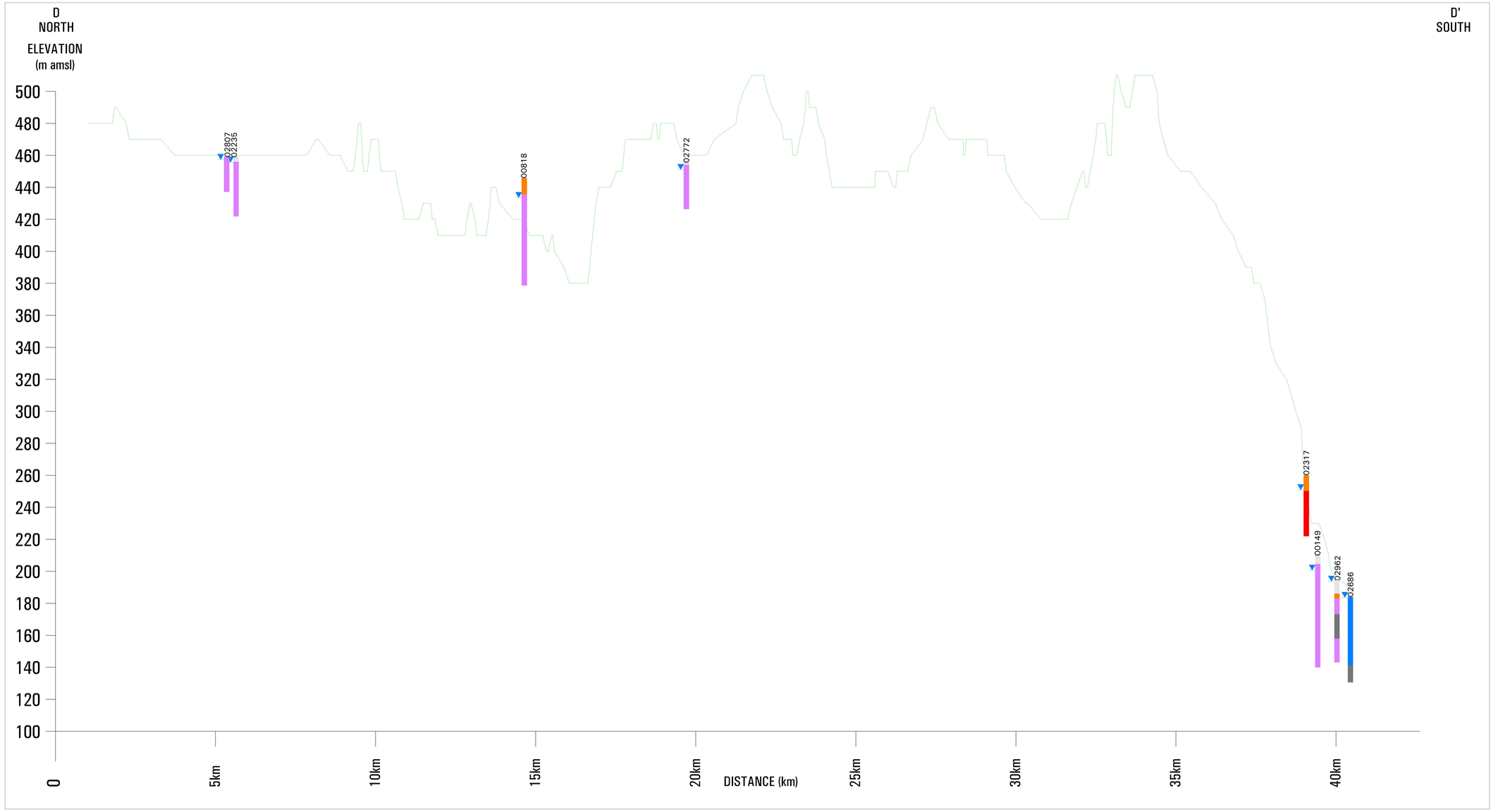
Prepared by: M. Dickie and C. Reynolds

Verified by: P. Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

XREF: HA034966 XSC.DWG



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

Figure 4.10
Cross-Section D-D'

Legend

00149 MOE Water Well Record Number

Lithology

- Fill
- Clay, Silty Clay
- Silt, Sandy Silt, Clayey Silt
- Sand, Silty Sand
- Gravel, Gravelly Sand
- Diamiction (Till)
- Limestone
- Rock
- Shale

Surfaces

- Interpreted Ground Surface
- Static Water Level

See Figure 4.6 for Cross-Section Location

This figures is to be read in conjunction with the accompanying report. References should also be made to the metadata completed for the study. This map provides valuable information for regional scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Vertical Scale 1:2,000
Horizontal Scale 1:100,000
Vertical Exaggeration 50x

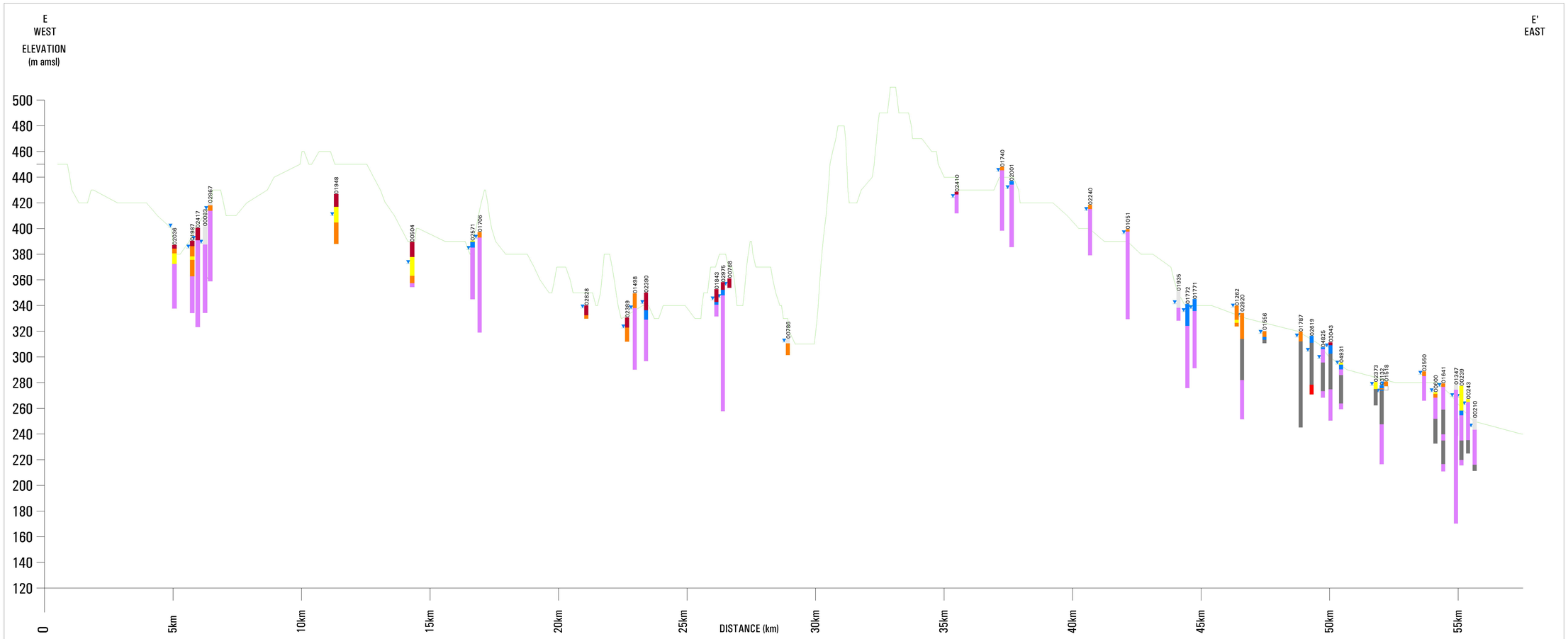
July 2005

Prepared by: M. Dickie and C. Reynolds Verified by: P. Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

XREF: HA034966 XSD.DWG



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

Figure 4.11
Cross-Section E-E'

Legend

02550 MOE Water Well Record Number

Lithology

- Fill
- Clay, Silty Clay
- Silt, Sandy Silt, Clayey Silt
- Sand, Silty Sand
- Gravel, Gravelly Sand
- Diamiction (Till)
- Limestone
- Rock
- Shale

Surfaces

- Interpreted Ground Surface
- Static Water Level

See Figure 4.6 for Cross-Section Location

This figures is to be read in conjunction with the accompanying report. References should also be made to the metadata completed for the study. This map provides valuable information for regional scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Vertical Scale 1:2,000
Horizontal Scale 1:100,000
Vertical Exaggeration 50x

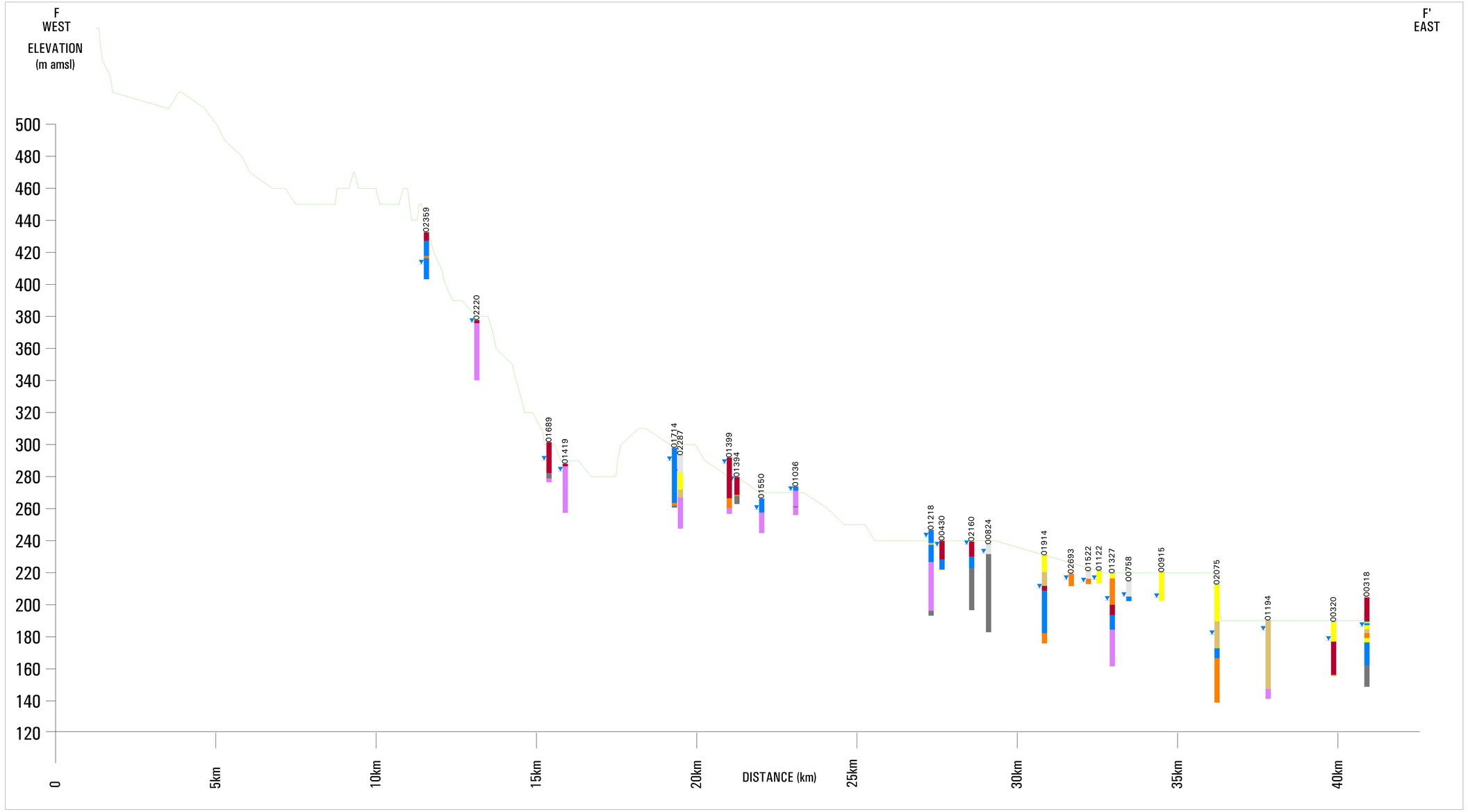
July 2005

Prepared by: M. Dickie and C. Reynolds Verified by: P. Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

XREF: HA034966 XSE.DWG



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

Figure 4.12
Cross-Section F-F'

Legend

00915 MOE Water Well Record Number

Lithology

- Fill
- Clay, Silty Clay
- Silt, Sandy Silt, Clayey Silt
- Sand, Silty Sand
- Gravel, Gravelly Sand
- Diamiction (Till)
- Limestone
- Rock
- Shale

Surfaces

- Interpreted Ground Surface
- Static Water Level

See Figure 4.6 for Cross-Section Location

This figures is to be read in conjunction with the accompanying report. References should also be made to the metadata completed for the study. This map provides valuable information for regional scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Vertical Scale 1:2,000
Horizontal Scale 1:100,000
Vertical Exaggeration 50x

July 2005

Prepared by: M. Dickie and C. Reynolds

Verified by: P. Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

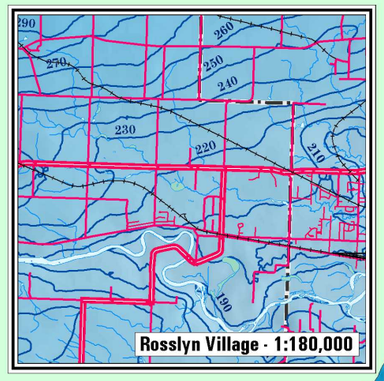
XREF:

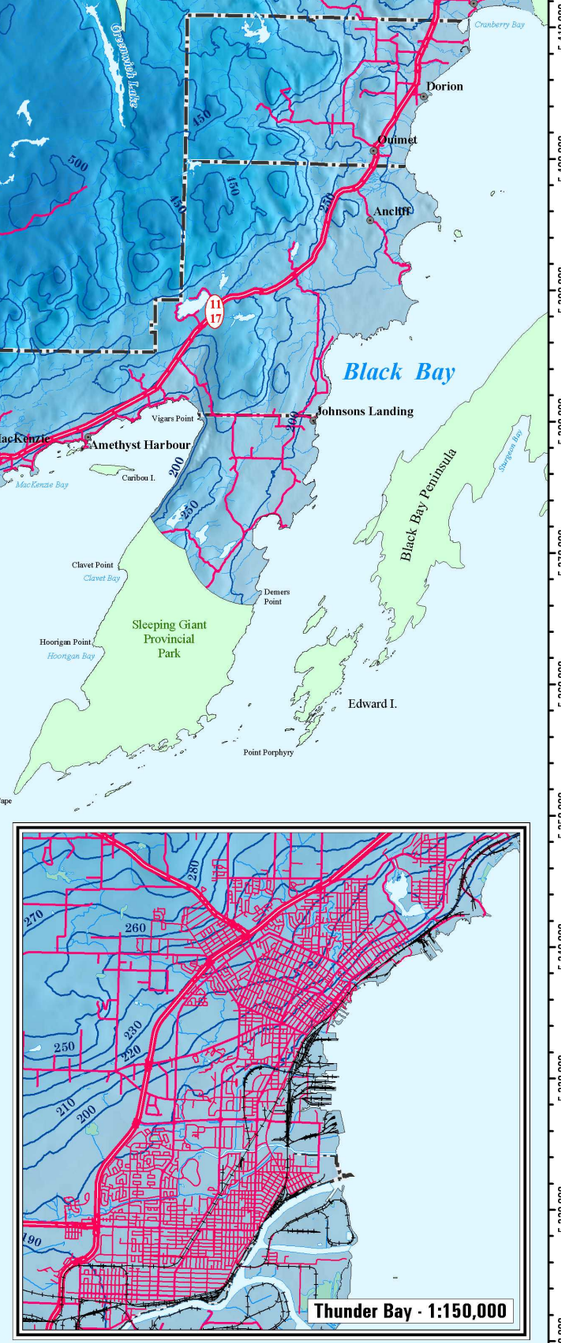
HA034966 XSF.DWG

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4.13

Water Table Surface





Village / Hamlet
Expressway / Highway
Collector Road
Local Road
River / Stream
Watertable Surface Contour (Main Map Int. 50m, Inset Map Int. 10m)
Rail (Inset Maps Only)
Municipal Boundary
Wetland (Inset Maps Only)
Water Feature
Non Study Area (Ontario)
Non Study Area (Minnesota)

Watertable Surface Elevation (Metres Above Mean Sea Level)

650
600
550
500
450
400
350
300
250
200
150

618 Highest Watertable Elevation shown on Map
183 Elevation of Lake Superior

The Water Table Surface is calculated from static water levels in wells that have a borehole depth less than 15m.

TThis figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

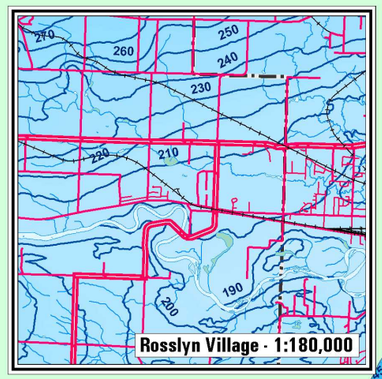
AMEC: TC035044
Burnside: HA034966

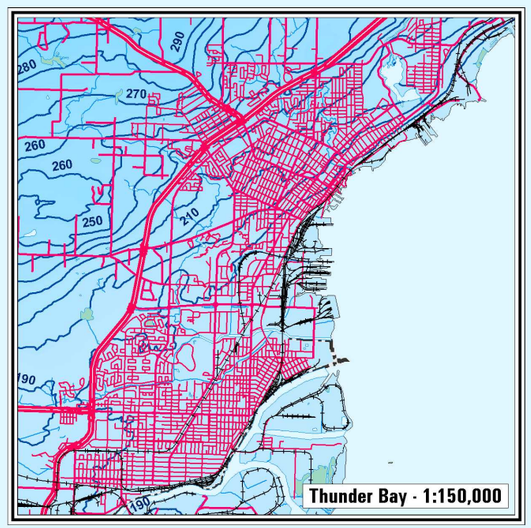
L:\HA034966\Map\Cartography\Fig_4_13_Watertable_Surface.mxd

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4.14

Potentiometric Surface





Village / Hamlet
Expressway / Highway
Collector Road
Local Road (Inset Maps Only)
River / Stream
100 Potentiometric Surface Contour (Main Map Int. 50m, Inset Map Int. 10m)
Rail (Inset Maps Only)
Municipal Boundary
Wetland (Inset Maps Only)
Water Feature
Non Study Area
Non Study Area (Minnesota)

Potentiometric Surface Elevation (Metres Above Mean Sea Level)

650
600
550
500
450
400
350
300
250
200
150

620 Highest Potentiometric Elevation shown on Map
183 Elevation of Lake Superior

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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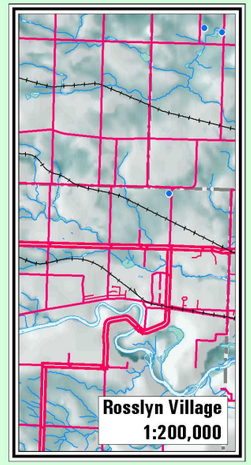
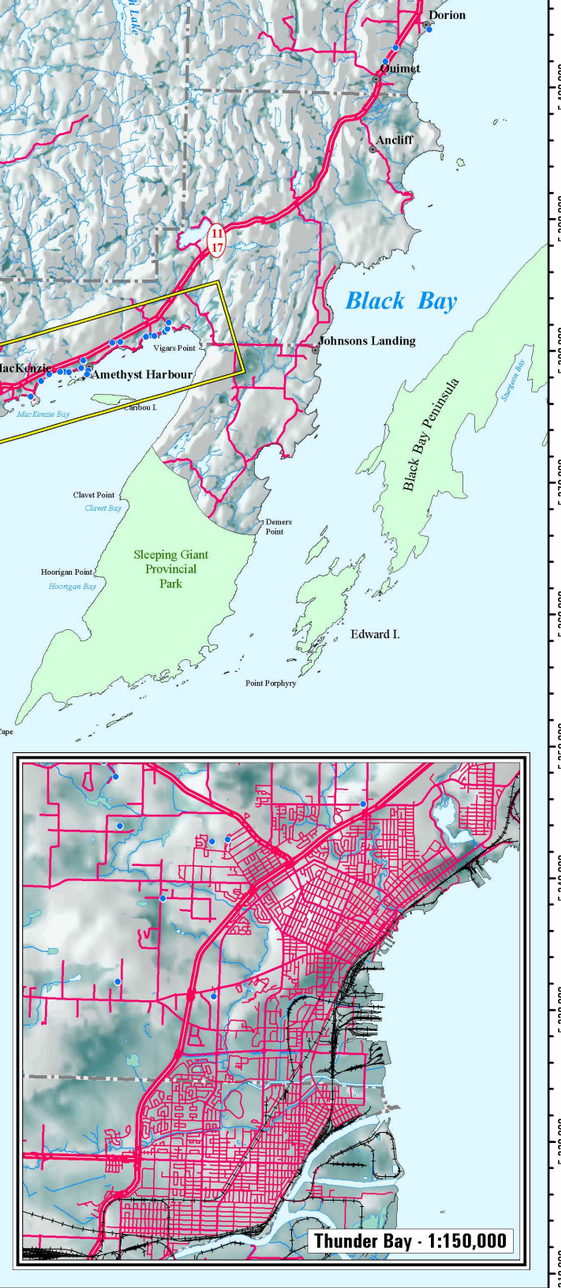
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4.15

Potential Recharge/Discharge





Flowing Well
Village / Hamlet
Expressway / Highway
Collector Road
Local Road (Inset Maps Only)
River / Stream
Rail (Inset Maps Only)
Municipal Boundary
Wetland (Inset Maps Only)
Water Feature
Non Study Area
Non Study Area (Minnesota)

Potential Recharge / Discharge Areas

Increasing Discharge Potential

Low to No Discharge Potential
(Likely Recharge Area)

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside:HA034966

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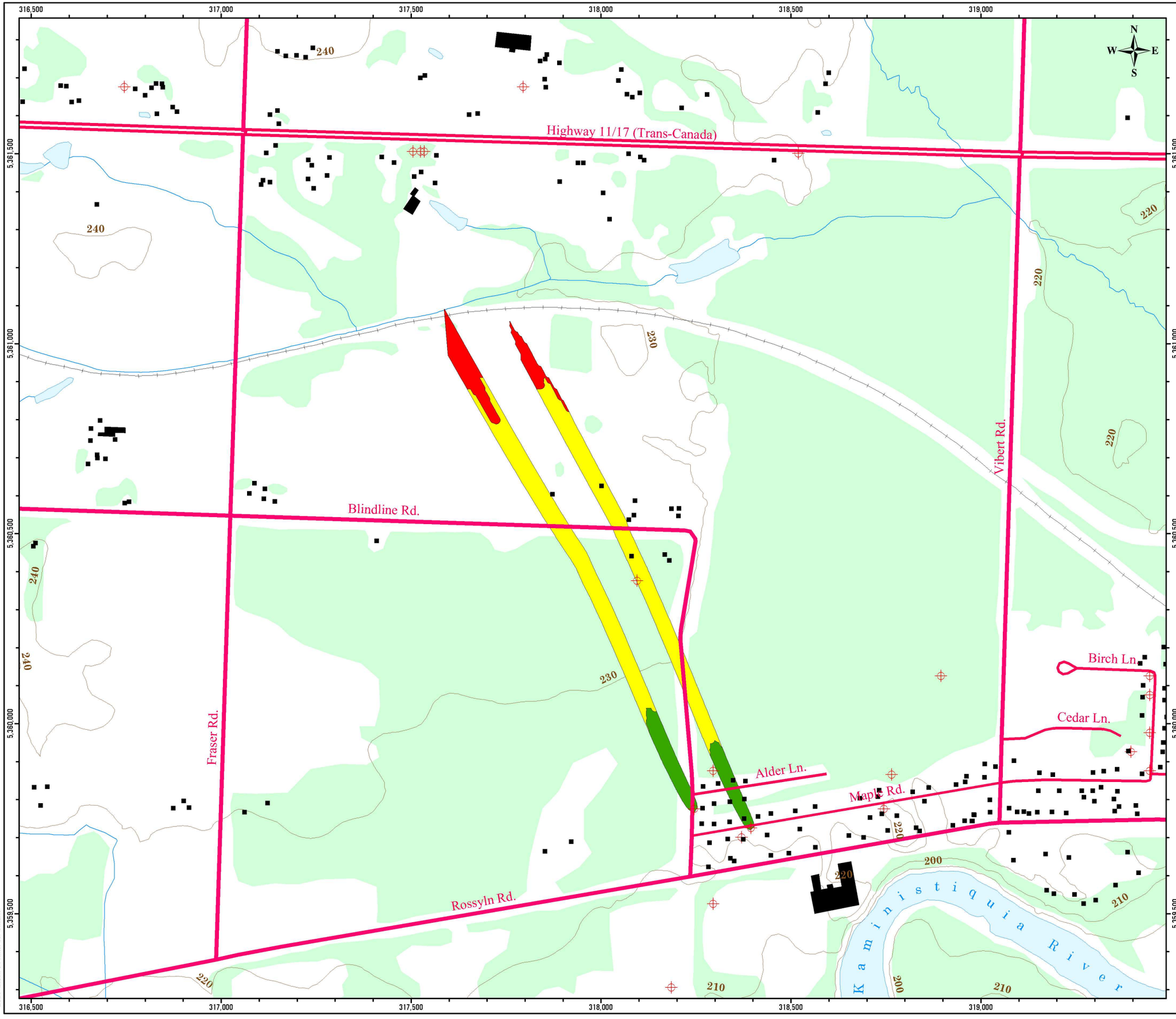
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 5.1

Capture Zones

Rosslyn Village Municipal Wells



- Building / Structure
- Wells
- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Wetland
- Water Feature
- Wooded Area

Capture Zones

- 25 Year Capture Zone
- 10 Year Capture Zone
- 2 Year Capture Zone

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 50 100 200 300 400 500
Meters

1:10,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TCo35044
Burnside: HA034966

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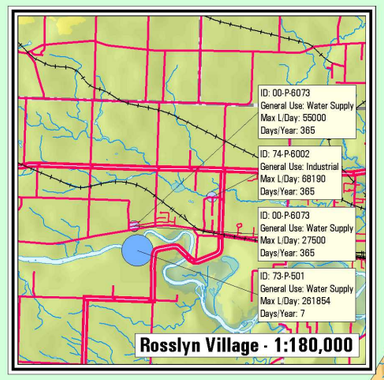
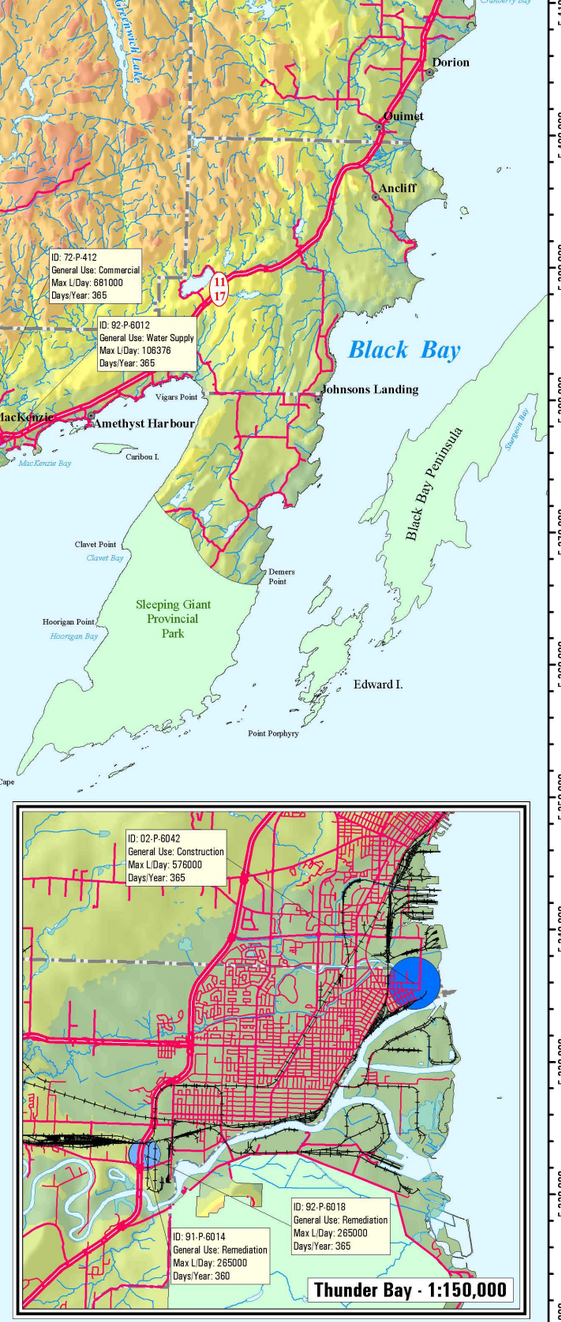
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6.1

Permits to Take Water Groundwater





- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Inset Maps Only)
- River / Stream
- Rail (Inset Maps Only)
- Municipal Boundary
- Wetland (Inset Maps Only)
- Water Feature
- Non Study Area
- Non Study Area (Minnesota)

- > 400000 L/Day
- 200000 - 400000 L/Day
- 0 - 200000 L/Day

Elevation (Metres Above Sea Level)

- < 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- > 600

Not all Permit to Take Water data available in the MOE database could be mapped due to lack of positional data.

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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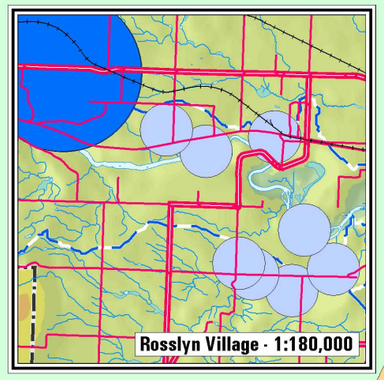
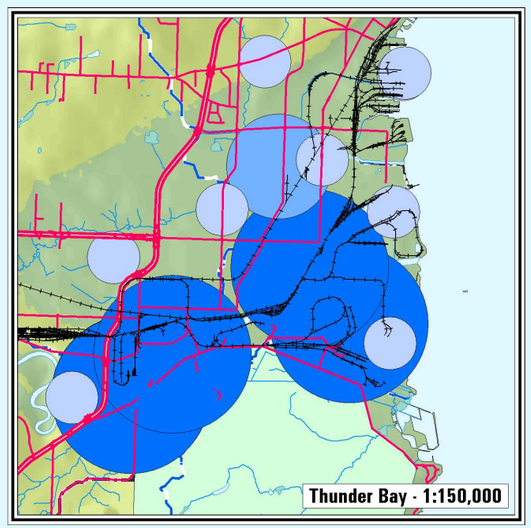
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6.2

Permits to Take Water Surface Water





- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Inset Maps Only)
- River / Stream
- Rail (Inset Maps Only)
- Municipal Boundary
- Wetland (Inset Maps Only)
- Water Feature
- Non Study Area (Ontario)
- Non Study Area (Minnesota)

- > 2,000,000 L/Day
- 1,000,000 - 2,000,000 L/Day
- 0 - 1,000,000 L/Day

Elevation (Metres Above Sea Level)

- < 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- > 600

Not all Permit to Take Water data available in the MOE database could be mapped due to lack of positional data.

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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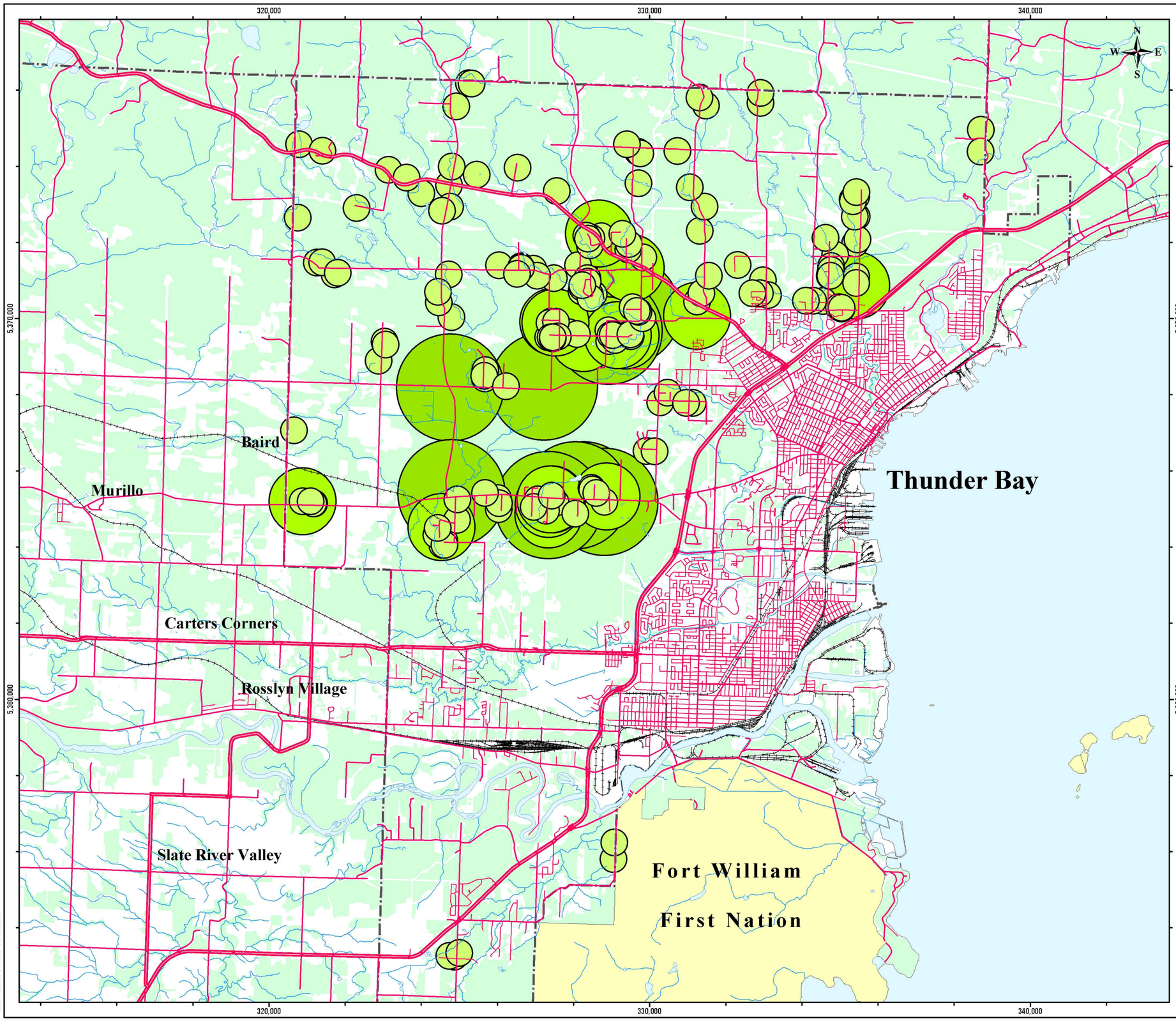
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6.3

Water Chemistry - Chloride



- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Municipal Boundary
- Wetland
- Water Feature
- Wooded Area
- Fort William First Nation (Non-Study Area)

> 500 mgl/L (High Value 1410.0mgl/L)

250 - 500 mgl/L

0 - 250 mgl/L (Low Value 0.02mgl/L)

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 1 2 3 4 5

Kilometers

1:100,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6.4

Water Chemistry - Nitrate

320,000 330,000 340,000

5,370,000 5,360,000

N W E S

Baird

Murillo

Carters Corners

Rosslyn Village

Slate River Valley

Thunder Bay

Fort William First Nation

- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Municipal Boundary
- Wetland
- Water Feature
- Wooded Area
- Fort William First Nation & Other Non-Study Areas

- > 10 mg/L (High Value 11.5mg/L)
- 5 - 10 mg/L
- 0 - 5 mg/L (Low Value 0.001mg/L)

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 1 2 3 4 5
Kilometers

1:100,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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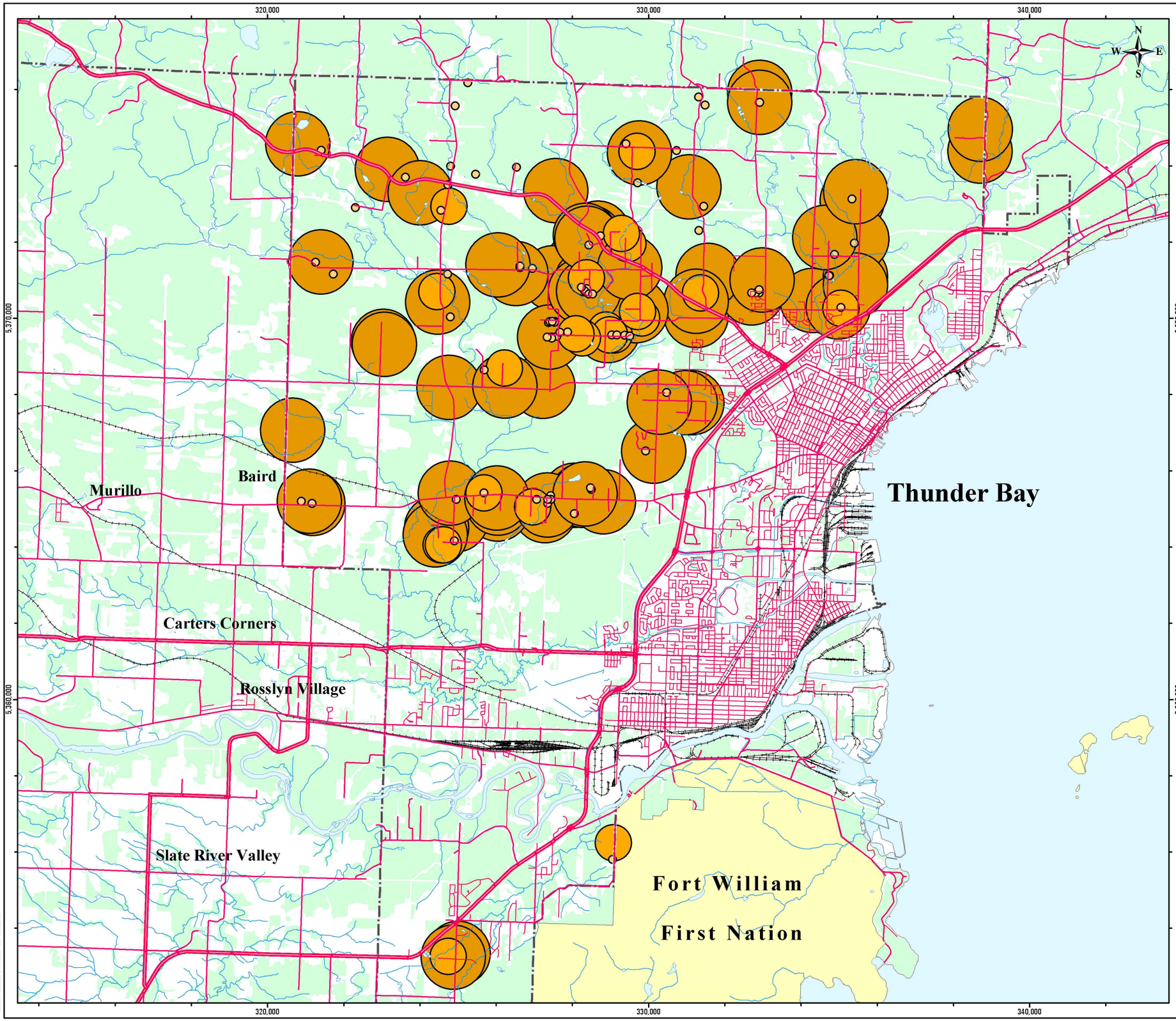
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6.5

Water Chemistry - Iron



- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Municipal Boundary
- Wetland
- Water Feature
- Wooded Area
- Fort William First Nation & Other Non-Study Areas

- > 0.3 mg/L (High Value 51.6 mg/L)
- 0.15 - 0.3 mg/L
- 0 - 0.15 mg/L (Low Value 0.005 mg/L)

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 1 2 3 4 5
Kilometers

1:100,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6.6

Water Chemistry - Sodium

320,000 330,000 340,000

5,370,000 5,360,000

N W E S

Baird
Murillo
Carters Corners
Rosslyn Village
Slate River Valley
Thunder Bay
Fort William First Nation

- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Municipal Boundary
- Wetland
- Water Feature
- Wooded Area
- Fort William First Nation & Other Non-Study Areas

- > 200 mgl/L (High Value 1170.8 mgl/L)
- 100 - 200 mgl/L
- 0 - 100 mgl/L (Low Value 0.209mgl/L)

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 1 2 3 4 5
Kilometers

1:100,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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320,000
330,000
340,000
5,370,000
5,360,000
N
W
E
S
Baird
Murillo
Carters Corners
Rosslyn Village
Slate River Valley
Thunder Bay
Fort William
First Nation

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6.7

Water Chemistry - Manganese

- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Municipal Boundary
- Wetland
- Water Feature
- Wooded Area
- Fort William First Nation (Non-Study Area)

- > 0.05mg/L (High Value 6.14.5mg/L)
- 0.015 - 0.05 mg/L
- 0 - 0.015 mg/L (Low Value 0.0008mg/L)

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 1 2 3 4 5
Kilometers

1:100,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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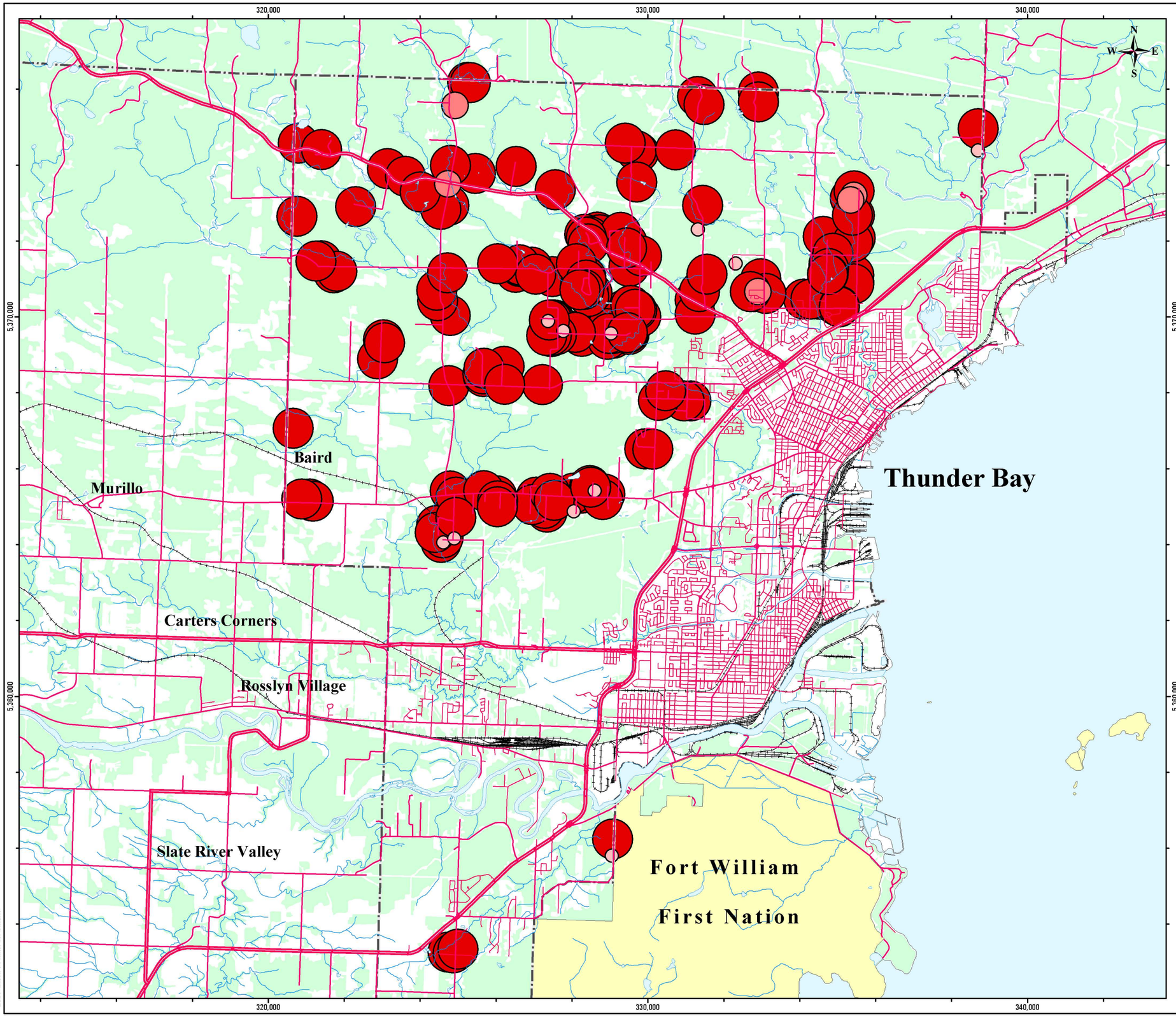
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6.8

Water Chemistry - Hardness



- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Municipal Boundary
- Wetland
- Water Feature
- Wooded Area
- Fort William First Nation (Non-Study Area)

- > 100mg/L of $CaCo^3$ (High Value 8284.5mg/L)
- 80 - 100 mg/L of $CaCo^3$
- 0 - 80 mg/L of $CaCo^3$ (Low Value 5.5mgl/L)

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 1 2 3 4 5
Kilometers

1:100,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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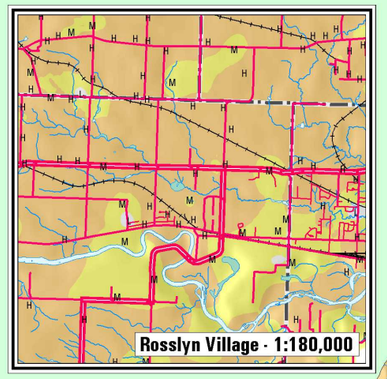
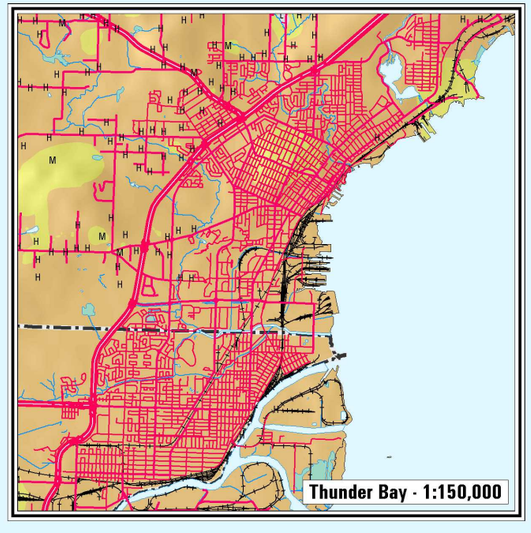
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 8.1

Intrinsic Susceptability to Contamination





H / M / L Selected Well Location with Reading

- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Insert Maps Only)
- River / Stream
- Rail (Inset Maps Only)
- Municipal Boundary
- Wetland (Inset Maps Only)
- Water Feature
- Non Study Area (Ontario)
- Non Study Area (Minnesota)

Intrinsic Susceptability to Contamination

- Low
- Medium
- High

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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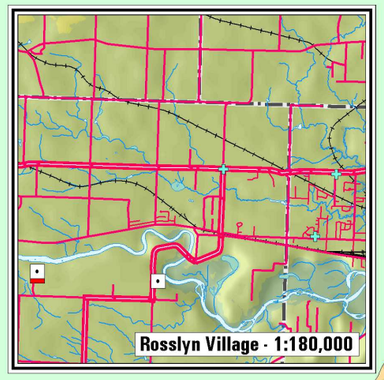
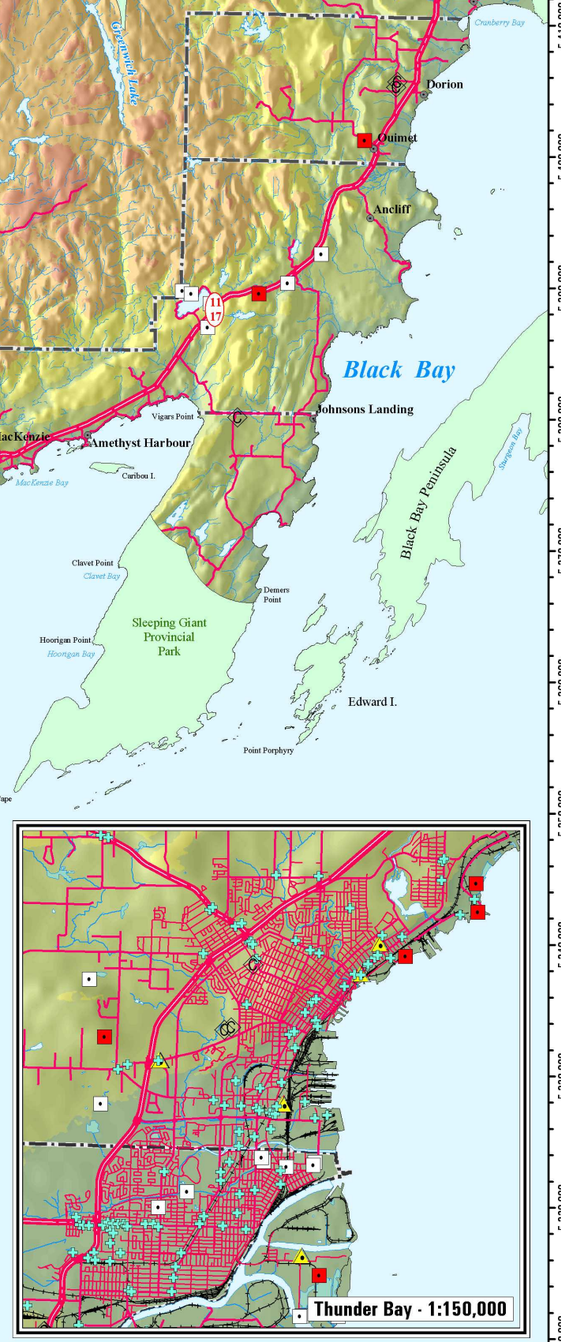
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 9.1

Potential Contamination Source Areas





- Cemetery
- PCB Location
- TSSA Location
- Active Landfill
- Closed Landfill
- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Inset Maps Only)
- River / Stream
- Rail (Inset Maps Only)
- Municipal Boundary
- Wetland (Inset Maps Only)
- Water Feature
- Non Study Area (Ontario)
- Non Study Area (Minnesota)

Elevation (Metres Above Sea Level)

- < 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- > 600

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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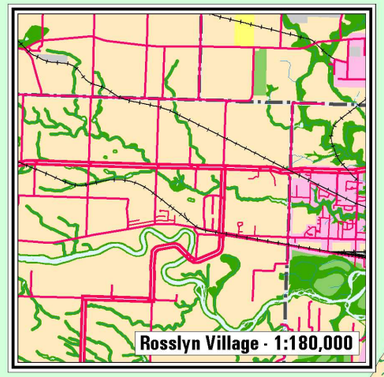
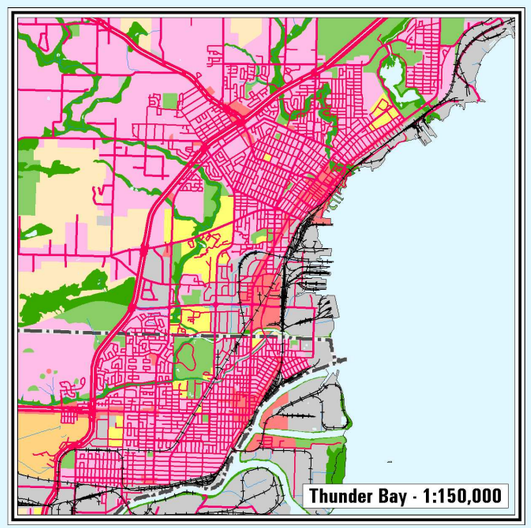
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 10.1

Land Use





Village / Hamlet
Expressway / Highway
Collector Road
Local Road (Inset Maps Only)
Rail (Inset Maps Only)
Municipal Boundary
River / Stream

Water Body
Non Study Area (Ontario)
Non Study Area (Minnesota)

Land Use Classifications*

- Residential
- Institutional
- Commercial
- Rural / Agricultural
- Environmental Protection / Use Limitation **
- Open Space
- Resource Extraction
- Recreational (Including Provincial Parks)
- Industrial / Waste Disposal
- Airport
- Watershed Reserve

* This map is a compilation of land use data provided by municipalities within the study area. It does not reflect the Official Plans of the municipalities involved and contains many areas of "extrapolated land use" where data did not exist or required generalization. This map should be used ONLY in reference to the groundwater study.

** With the exception of the City of Thunder Bay and selected other areas, the Environmental Protection / Use Limitation classification is based on a buffer applied to surface water features and wetlands.

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
24 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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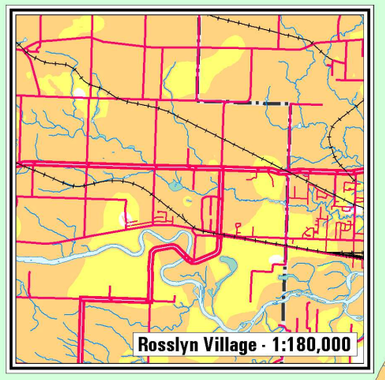
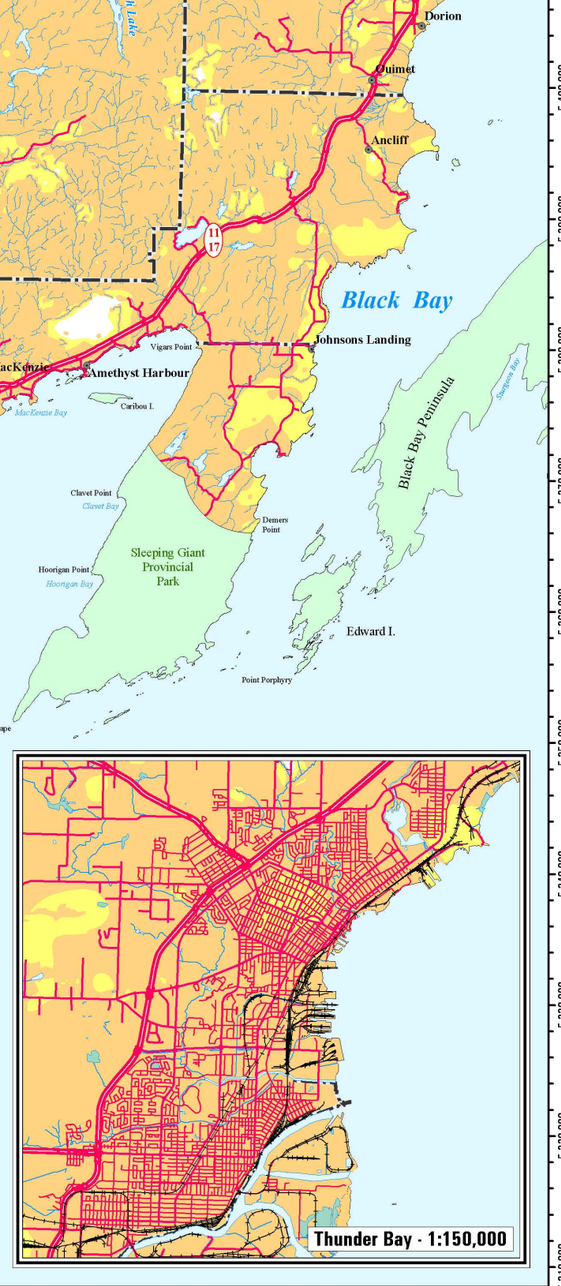
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 11.1
Land Use Risk Rating





- Village / Hamlet
- Expressway / Highway
- Collector Road
- Local Road (Inset Maps Only)
- River / Stream
- Rail (Inset Maps Only)
- Municipal Boundary
- Wetland (Inset Maps Only)
- Water Feature
- Non Study Area (Ontario)
- Non Study Area (Minnesota)

Land Use Risk Rating

- Low
- Medium
- High

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 5 10 20
Kilometers

1:450,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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317,000 318,000 319,000

5,361,000 5,360,000 5,359,000

N W E S

25 Year Capture Zone

10 Year Capture Zone

2 Year Capture Zone

Blindline Rd.

Fraser Rd.

Vibert Rd.

Cedar Ln.

Alder Ln.

Maple Rd.

Rossyln Rd.

Highway 130

220

210

220

Kaministiquia River

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 11.2

Land Use Risk Rating
Rosslyn Village

- Well
- Building / Structure
- Expressway / Highway
- Collector Road
- Local Road
- River / Stream
- Rail
- Municipal Boundary
- Contours
- Outline of Capture Zone
- Wooded Area
- Wetland
- Water Feature

Land Use Risk Rating

- Low
- Medium
- High

This figure is to be read in conjunction with the Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study. References should also be made to the metadata completed for the study. This map provides valuable information for regional-scale analyses. A re-assessment that includes other local-scale information may be required to verify the degree of accuracy at any specific location.

Mapping data provided by the Ministry of the Environment, Ministry of Natural Resources, Ministry of Northern Development and Mines, City of Thunder Bay, and the Environmental Systems Research Institute (ESRI) Inc.

0 100 200 300 400 500

Meters

1:10,000
28 June, 2005

Projection: UTM Zone 16
Datum: NAD 83

Prepared By: Paul Stubbert

Verified By: Peter Rider

BURNSIDE amec

AMEC: TC035044
Burnside: HA034966

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APPENDICES

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Appendix A
MOE Technical Terms of Reference

Groundwater Studies
2001/2002

Technical Terms of Reference

November 2001

Acknowledgments ...

This Technical Terms of Reference document reflects the many discussions and energetic dialogue that has occurred through and since 1997 with the inception of the Provincial Groundwater Management Studies under the Provincial Water Protection Fund.

In dealing with the difficult technical issues, the Grand River Conservation Authority, Regional Municipality of Halton, Conservation Ontario, the thirty-four groundwater studies teams and numerous technical consultants, Ontario Ministry of Natural Resources, Land Information Ontario, Ontario Geological Survey, Geological Survey of Canada, Toronto Region Conservation Authority, Ontario Ministry of Environment staff, Ontario Ministry of Agriculture and Rural Affairs, Ontario Ministry of Municipal Affairs and Housing continued to share their practical insight and professional practices.

Table of Contents ...

1.0 General Requirements for Groundwater Studies ...

This document outlines the technical terms of reference for the Groundwater Studies completed through Ontario's Operation Clean Water initiative announced August 22, 2001.

Groundwater Management Studies were first initiated in 1997 through the Provincial Water Protection Fund. Since that time, 34 groundwater studies involving some 100 municipalities and thirteen counties have been completed. The experience of those initial studies has been relied on to gather together the information provided in this document.

The purpose of this terms of reference is to define the requirements for consultants, municipalities, conservation authorities, and health units, who are undertaking groundwater studies under the provincially announced Groundwater Studies initiative 2001/2002. The information and analysis generated by these studies represents the first phase of groundwater source protection, will assist in developing future environmental policy, and will support the development of local and regional groundwater protection strategies.

The information presented here provides a general description of the objectives, and in particular, outlines the interim minimum standards, thresholds, and requirements to be used in carrying out the groundwater studies. Work is expected to continue on these interim standards and requirements in the future in order to meet the Groundwater Study objectives. The following are the general requirements for Groundwater Studies.

1.1 Partnerships

Because groundwater systems do not conform to municipal boundaries, municipalities, conservation authorities and other stakeholders need to work together on these groundwater studies. Cooperation among participants will enable the collection of compatible groundwater data that will extend to the natural boundaries of watersheds and groundwater aquifers.

Specifically, cooperation will be required among upper and lower-tier municipalities, public utilities, health units and conservation authorities in undertaking groundwater studies. Conservation authorities are capable of providing an essential watershed-level perspective to municipal groundwater studies, as well as a high degree of technical expertise. Accordingly, wherever feasible and with the agreement of all affected parties, it is expected that representatives from Conservation Authorities will play a major facilitating role in studies (e.g., project management). Upper-tier municipalities are also expected to play a leadership role in these studies, depending on local circumstances.

1.2 Steering Committee, Public Involvement, and Project Management

A steering committee is required for each study, and would be responsible for overseeing the technical and public involvement aspects of the study. It is strongly recommended that the steering committee include not only technical, municipal and consulting staff, but also representatives of the agricultural, environmental, business, and industrial sectors, as well as community groups that may be affected by future municipal groundwater strategies. At a minimum, the steering committee is expected to meet quarterly through the study process.

Involvement of the public in the study process is also an important part of groundwater management. If the members of the public are involved and informed in the early stages of a study which assesses the location of the resource, the risks of contamination, and current groundwater use, they are more

knowledgeable and prepared to support implementation of appropriate protection and prevention measures.

Accordingly, each study must include a plan for informing and involving the public through a minimum of two, to three, public open house meetings, and other practical actions, such as setting up an education and information booth at community events. To assist with groundwater education, the Ministry of the Environment (MOE) will provide copies of a groundwater education video, entitled "*Groundwater: Our Hidden Treasure*" to all grant recipients.

Depending on the scope of the study, a project manager may be required.

1.3 Funding Information

Grant recipients will receive baseline funding to cover 70% of approved groundwater study costs with an increase to 85% for the inclusion of the following activities:

a) digitizing all data collected and submission of the data to the MOE,
b) georeferencing of all communal wells in the study area and submission of the georeferencing to the MOE, and
c) developing an action plan outlining next steps for groundwater source protection for the study area.

Note: Some key actions to consider in examining source protection and prevention options for groundwater communities include:

- *land securement and protection mechanisms;*
- *private land stewardship;*
- *wellhead and groundwater source protection policies;*
- *pollution prevention activities;*
- *community involvement, education, and outreach programs; and*
- *monitoring and contingency planning.*

1.4 Eligible Study Costs

1. Costs paid to professional specialists (e.g., hydrogeologists, engineers, economists, planners) and project management consultants for studies are eligible, provided the municipality ensures these costs are properly supported by invoices and related solely to the study project.

2. In-house labour costs are not eligible. The costs of contract, part-time, and student labour hired specifically for the project are eligible.

3. Miscellaneous costs related to the study as required by the consultant (such as rental of specialized equipment, drilling, pumping tests) are eligible. If in doubt, municipalities should consult with the MOE.

4. Financing costs, such as debenture costs and interest costs (interim financing charges), are not eligible.

2.0 Groundwater and Aquifer Characterization Studies ...

Local groundwater conditions should be understood within the context of the larger, regional groundwater flow systems of which they are a part. Basic groundwater functions of recharging, transmitting, attenuating potential contaminants, and storing and discharging water are necessary to provide a secure supply of clean water to communal water systems as well as individual groundwater users without access to a municipal supply. These regional groundwater functions also play an essential role in maintaining ecosystem health, including aquatic and terrestrial ecosystems.

Accordingly, an understanding of regional groundwater conditions and their inherent susceptibility to contamination, is critical to maintaining these ecological and sustainable use functions. The objectives are as follows:

a) to define the aquifer resources of a municipality and watershed through a series of maps and data sets meeting a minimum provincial standard;

b) to have consistent groundwater mapping at a scale of 1:50,000;

c) to conduct analysis with a clear methodology relating the data to the final product; and

d) to use at all times the best possible information available.

2.1 Local and Regional Groundwater Conditions

Purpose – In order to bring together data and information that is used for the long term management of groundwater resources, such as wellhead protection, aquifer management, water supply and demand planning, water budget maintenance, and integrated watershed planning, the studies should be designed to provide a good understanding of both regional and local groundwater conditions.

Conceptual Model – The first step in developing this understanding is to create a conceptual model of the groundwater system in the geographic area being studied. This means assessing the features and functions of the groundwater resources, and cataloguing stresses and threats, such as water takings, effluent discharges and contaminant sources. A thorough understanding of the data and information gaps will have implications to the comprehensiveness of the plans. Separately, but also important is determining the barriers to source protection created by the fragmentation of the regional groundwater systems as result of institutional and municipal boundaries.

The integration of a diversity of data and information for a clearer understanding of the dominant elements of the groundwater flow system within a study area includes the geologic processes, the geochemical processes, changes in the landscape and the effects on the character, distribution, hydraulics and flow of water through the system. Ultimately, the conceptual model can be described in terms of critical features and functions of the hydrogeology, including flow paths, times of travel, confining layers, unconfined layers, semi-confining layers, aquifer characteristics, recharge areas, and discharge areas. Geochemistry and existing contamination will be invaluable to developing the conceptual model.

Although the key objective of a preliminary data analysis is to form a conceptual geological and hydrogeological model for interpreting water occurrence, character, and movement, as much

hydrogeological information (pump tests, contaminant studies, monitoring data, etc.) as feasible should be reviewed and assessed in developing the conceptual model. A preliminary data analysis will yield a general understanding of the data distribution and density within a study area. Through this process, data validation becomes possible.

Data Gaps – The ideal is to use all of the data giving regard to the provenance including anecdotal information such as spot measurements and recollections, by assigning relative importance to the individual data points and components. Where data is absent on any portion within the sequence or having a poor spatial distribution across the study area this must be noted early within the study process. These identified data gaps can be used to plan for and obtain necessary data through the study process.

In some cases, data gaps can be seen and thereby potentially guide the process for the collection of further relevant data. This step allows the clear transition from raw data to the more complex data analysis processes possible through the use of geostatistical, relational database, and GIS mapping tools.

Data Validation – The validation process for bringing together the best and most reliable data within a given study area may be time consuming, however, without a documented validation process to define the data set used in preparing derived map products, the results are likely suspect. Data validation processes must select for the data that best represents the entire groundwater active sequence in a study area in overburden as well as bedrock. See details on standardization objectives, methods and rules presented in *Schedules A* through *G* later in this document. Data selection and validation rules, when used, must be stated and included in the metadata. The following are typical data validation processes:

- *Location* **–** checking congruity between various data sets such as geographic references such as county, township, lot and concession, physical features, air photos, parcel fabric, digital elevation model, historical topographic maps used to estimate map-based co-ordinates, use of GPS measured georeferenced co-ordinates , use of existing reliability coding, matching well owner names, etc;

- *Elevation* **–** checking congruity between water well elevation with historical topographic maps, the provincial digital elevation model (DEM), benchmarks, geodetic survey information, use of GPS, use of elevations on water bodies such as streams, reservoirs, lake and wetlands that preserves the direction and descent of surface flow representing the establishment of drainage areas such as watershed and subwatershed, recognizing closed drainage areas such as hummocky terrain and karstic areas;

- *Interpretation* **–** checking congruity, confirmation and evaluating the balance of evidence using geophysics analysis, sample results, core analysis, outcrops, geotechnical boreholes as well as oil and gas boreholes to corroborate a sequence of geological environments of deposition/erosion and corresponding paleoecological environments, identifying hydrogeological settings and active hydrogeological units such as aquitards and aquifers, corresponding water quality, age, and major flowpaths accounting for both transient and steady-state conditions for both horizontal and vertical movement. There has been consensus about applying the GSC geomaterial protocols early in the borehole geology data interpretation; and

- *Metadata* **–** The provincial metadata standard available through MNR Land Information Ontario is to be used for the groundwater studies. Each of the data and map products will be registered as a record and details regarding data validation will be entered in the areas entitled “Data Sources” or

as appropriate in other sections. See *Schedule B* in particular for an example for documenting the metadata related to the GSC Geomaterial Protocol.

2.2 Methodology for Defining Groundwater Intrinsic Susceptibility

Purpose – In general, groundwater intrinsic susceptibility maps identify areas where contamination of groundwater is more (or less) likely to occur as a result of surface contamination. It is anticipated that land managers, municipal planners, and facility owners and operators will be able to use groundwater intrinsic susceptibility (GwIS) maps showing the areas of high, medium, and low intrinsic susceptibility and index values at point locations. The GwIS maps can be used as a general guide to preserve existing groundwater resources by diverting potentially harmful land use from areas of higher groundwater susceptibility to areas of lower groundwater susceptibility. Furthermore, recognizing that today's groundwater contamination is tomorrow's surface water contamination, the maps can be effective in preserving the ecosystem functions linked to the groundwater systems.

Rationale – The rationale for this method is linked to time of travel. The vulnerability is tied to arrival of a contaminant at the water table and or the shallowest aquifer. The method is not geared to assessing a specific contaminant, contaminant group or human activity. This method assesses intrinsic vulnerability or susceptibility with limited consideration of the specific attributes of the hydrogeologic system or the behavior of contaminants. The two key attributes considered are the depth to water table and the conductivity of geologic material in the unsaturated zone (or above a confined aquifer). Although the method considers only the intrinsic susceptibility of the shallowest aquifer, deeper aquifers will be of interest to the local municipality. A modification of this method that uses an "effective thickness" instead of depth to water table, where the effective thickness represents the time of travel to the aquifer, would be a useful first cut at determining the intrinsic susceptibility of aquifers below the shallowest aquifer. This method is also used for determining the intrinsic susceptibility of confined shallow aquifers. Here, the depth to the aquifer is used instead of the depth to water table.

Intrinsically, fine unfractured media retards contaminant migration whereas fractured media, or coarse porous media, provides faster travel times and less retardation and hence more vulnerability. For example 20 metres of silt over a confined aquifer would have a low intrinsic susceptibility. But 10 metres of clean coarse sand or fractured rock would have a high susceptibility to contamination.

There are other factors that could be used to improve the understanding of a system's intrinsic susceptibility to contamination. Such factors may include gradients, recharge and discharge, flow paths and local geology. This information can be used to adjust the intrinsic susceptibility values.

This method presumes sufficient water well records and topography information are available to predict water table with certainty over the geographic area. In some areas, insufficient water wells, lack of a digital elevation model, or other issues may preclude the use of water table. In these cases, an "effective thickness" may have to be used that best approximates depth to water table.

Goal – Mapping of groundwater susceptibility should be undertaken using the MOE Water Well Information System (WWIS) as a primary data source. Vulnerability mapping is a tool that can be used to make planning decisions to protect groundwater resources and its ultimate use.

A key product is mapping of the groundwater intrinsic susceptibility to contamination at different levels of susceptibility (e.g., low, medium and high.) The mapping requires a careful assessment of the groundwater system and then moving to identify critical factors that can be used in the mapping of

vulnerability. Decisions about additional factors and their application going beyond the method described here rest with the groundwater expert and the local study teams, in consideration of the needs of the product users. The MOE requires that the following methodologies be used as a minimum standard.

General Procedures – The hydrogeologist must develop a conceptual model of the hydrogeologic system for which the intrinsic susceptibility mapping is to be created. Developing a hydrogeologic conceptual model will require the expertise of an experienced hydrogeologist. The hydrogeologist can then determine the critical factors that must be assessed and integrated into the susceptibility assessment.

In the context of the data available from the MOE Water Well Information System (WWIS), groundwater intrinsic susceptibility can be inferred from the well geology, water table position, vertical gradients and possibly the screen location. The method prescribed herein will focus on the geology and water levels alone. Screen locations are considered to be often more reflective of a deeper 'production aquifer', rather then a surficial aquifer with important ecosystem functions. Screen locations are therefore not used in the methodology, but may be considered for any additional maps assessing the deeper aquifers.

The method is based on calculating a susceptibility index at each well, then mapping the indexes using an interpolation technique such as kriging (although even hand contouring may be effective in some areas). Both the map and the individual well indexes are deliverables of this project. The index calculation requires a sequence of logical statements to evaluate the hydrogeological conditions at each well, followed by arithmetic statements to sum up the net susceptibility index at each well. This is achieved conveniently using a programming language such as VB or VBA within a database such as Microsoft Access (although it may also be accomplished with spreadsheet software). Several of the steps will also require a working knowledge of GIS software with interpolation packages. For details, refer to *Schedule A: Required Groundwater and Aquifer Characterization Components with Methodologies*.

Uncertainty – In light of the general uncertainty within the data in the WWIS, it is strongly recommended that the groundwater intrinsic susceptibility (GwIS) maps not be used directly for planning purposes without further site specific verification regarding any potential sources of contamination.

Local Expertise – Consultants are encouraged to apply local expertise to improve the quality of the mapping product. The Ministry recognizes that elements of the maps, such as water table, are the product of considerable interpretation. Local knowledge of groundwater flow systems, pump tests, geochemistry, soils, topography and other factors could have important effects on vulnerability assessments when taken into account. For the local context the consultant must apply knowledge of local hydrogeologic/geologic conditions, factors and uncertainties in existing databases to enable the best decisions to be made on vulnerability. Only limited procedures are offered in applying decisions in these cases.

Study participants are also encouraged to apply local hydrogeological knowledge and expertise to develop enhanced local scale Groundwater Intrinsic Susceptibility (GwIS) maps for immediate land use planning applications. The mapping procedures are left to the discretion of the funding recipient, but should include locally relevant hydrogeological data and an appreciation for local groundwater flow systems.

References – The International Association of Hydrogeologists publication "Guidebook on Mapping Groundwater Vulnerability" (1994, edited by Jaroslav Vrba and Alexander Zaporozec) is recommended as useful reference to further understand founding concepts of aquifer vulnerability mapping, and provide guidance on the use and interpretation of the data types available.

2.2.1 Step 1: Data Preparation

Geological Descriptions – The Geological Survey of Canada has developed rules for improving the geological descriptions in the MOE Well Log Database which are presented in *Schedule B*. These revised descriptions will be included in the database provided by the MOE or otherwise made available to grant recipients, and should be used for the GwIS map. A list of the GSC terms is included in *Schedule B* of this document. This step has been shown to improve the quality of the geological descriptions used for the GwIS map.

Well Selection and Screening – All wells with a MOE Well Log database universal transverse mercator (UTM) or Elevation Reliability Code error of more than 6 should be initially filtered out of the analysis. The UTM error code refers to the estimated accuracy of the UTM coordinates for the well; a code of 6 implies an error of at least 300 m. Similarly an Elevation Error Code of 6 implies an elevation error of at least 15 metres.

2.2.2 Step 2: Water Table

A depth to water table map is a requirement of the groundwater study, and is to be used in the preparation of the GwIS map. The water table depth map should be prepared by interpolating a water table surface based on the static water level depths from shallow wells. The consultant is required to assess the local hydrogeological regime and develop a rationale for selecting 'shallow wells' and other relevant data points for the generation of a water table map. The map will be considered the 'best available' depth to water table surface, and should be updated periodically as new information comes available.

Database Updates – The depth to water table is required at all wells in order to calculate the groundwater Intrinsic Susceptibility Index (ISI) at each well. The consultant is therefore required to add the interpolated depth to water table from the map to all wells in the database for the study area.

Inadequate Or Unreliable Water Table Data – For each stratigraphic layer, for selected "Effective Thickness" or depth from ground surface, which has been derived from the preliminary data analysis, a K-Factor (see *Schedule C: Generic Representative Permeability (K-Factor*) Table) is estimated and is multiplied by the thickness of that layer. The summed value of the K-Factors is then used to classify whether an area is of High, Medium, or Low Intrinsic Susceptibility to Contamination. This method can be used where it can be justified to the MOE, prior to using the method, that the water table information is inadequate and will lead to misleading or unacceptable uncertainty. The rationale will need to be provided to the MOE, as well as the detailed description of the method. The MOE will decide what areas or parts of areas can be mapped using an alternate method. The "effective thickness" should represent a reasonable surrogate for depth to water table and/or depth to aquifer and should based on a review of all hydrogeologic information, including the water wells. Histograms of water wells with depth to water table, etc. should be included in the rationale.

2.2.3 Step 3: Calculation of Intrinsic Susceptibility Index (ISI) at Each Well

The preparation of the GwIS map includes calculation of an intrinsic susceptibility index (ISI) for each well. This value is written to the database and used to prepare the final map.

The ISI is calculated by summing the product of the thickness of each unit in the well log and a corresponding K-Factor. The K-Factor (reference table provided in *Schedule C*) is a dimensionless, relative number that can be loosely related to the exponent of the vertical hydraulic conductivity in m/s.

The calculation is performed from surface to a lower limit defined by the water table configuration.

The consultant shall assess the geology at each well, distinguishing aquifers from aquitards to properly account for consecutive layers of similar materials.

The consultant shall determine on a well-by-well basis if the aquifer of interest is confined, semi-confined or unconfined. The regional groundwater intrinsic susceptibility (GwIS) map is focused on evaluating the uppermost 'significant' aquifer (to be determined by the consultant and the local study team), and considering:

- the use of the aquifer as a drinking water source;
- the linkage of the uppermost aquifer to any local surface water systems and the sensitivity of these systems; and
- the linkage the aquifer might have to deeper aquifers that are used for drinking water.

Confined Aquifers – For confined aquifers, it is reasonable to assume that contaminants from the surface must migrate through the confining layer and reach the aquifer to cause potential impact. Therefore, the ISI is calculated by summing the product of the thickness of each geological unit in the well and the corresponding K-Factor (refer to *Schedule C*), from ground surface to the top of the first significant aquifer.

Unconfined Aquifers – For unconfined aquifers, it is reasonable to assume that contaminants from the surface must only migrate to the water table to cause potential impact. Therefore, the ISI is calculated by summing the product of the thickness of each geological unit in the well and the corresponding K-Factor, from ground surface to the water table.

Semi-confined Aquifers – For semi-confined aquifers or where there is doubt about the integrity of the confining layer, it is reasonable to assume that contaminants from surface must migrate through a leaky layer and reach the aquifer to cause potential impact. Expert judgement is needed to evaluate the hydrogeological and hydrological information collected for the groundwater studies. Determining if a field of wells should have a modified K-Factor should be based on best professional judgement. The ISI is calculated by summing the product of the thickness of each geological unit in the well and an appropriate K-Factor (refer to *Schedule C*), from ground surface to the top of the water table.

Missing Aquifers – For wells where no aquifer material is detected, based on the codes provided in *Schedule B*, the ISI will be calculated as the sum of the product of the unit thickness and the K-Factor from the ground surface to 15 metres below the ground surface.

Data Reliability Issues – Where the data and well density are too low to confidently produce the mapping of the water table and geologic materials an alternate method must be proposed which is as faithful as possible to the MOE suggested method. Unreliable wells can be screened out.

Adjustments might also be appropriate where it is clear that certain information sources consistently misrepresent a geological feature of significance. The methods used must be clearly documented for dealing with data reliability issues and interpolation methods between water wells. Adjustments may be used as they arise during the derivation of enhanced local groundwater intrinsic susceptibility maps

through the use of local expertise.

Definitions – The specific definitions of the first “significant” aquifer and what qualifies as a semi-confined aquifer, confined aquifer will be defined by the consultant in the context of local hydrogeological conditions.

2.2.4 Step 4: Categorizing Intrinsic Susceptibility Index (ISI) Values

For final mapping purposes, the ISI value at each well is categorized into Low (<30), Medium (30 to 80), and High (>80) groupings. The thresholds defining the limits of these categories will be established by the consultant to best reflect local hydrogeological resources and functions.

Once the initial classification has been applied and shown on a preliminary map, the classification limits may be adjusted to reflect local conditions by the consultant to produce the final derived map. The threshold rationale must be clearly described and justified, and account not only for water supply aquifers, but also the ecosystem functions as related to wetlands, rivers, etc..

2.2.5 Step 5: Mapping

The final map is developed by interpolating the categorized ISI values at each well. Although the selection of an interpolation method shall be at the discretion of the consultant, a kriging algorithm is recommended, using a grid cell size of 500m or less with a preference for a lower grid spacing.

Boundary Harmonization – Consultants must identify how boundary issues with adjoining municipalities will be harmonized. Adjacent study areas must work together for the harmonization of the thresholds where they have been modified from the original classification. Harmonization issues include: geomaterial coding, water table and confined or unconfined aquifer definitions, and intrinsic susceptibility evaluations. The MOE may provide ground rules on harmonization where there are circumstances of unresolvable harmonization of threshold tiers.

Intrinsic Susceptibility Thresholds –

- Low intrinsic susceptibility values will be greater that 80;
- Low to moderate intrinsic susceptibility values will be between 30 and 80; and
- High intrinsic susceptibility values will be less than 30.

2.3 Regional Contaminant Source Inventory

Another essential element in the protection and management of groundwater resources is an inventory of potential contaminant sources to the regional groundwater system. The purpose of this contaminant inventory is to identify past, present, and future (proposed) activities that could pose a potential long term risk to groundwater aquifers. A regional contaminant source inventory (CSI) will provide information on the location of contaminant threats and identify where future risk mitigation measures may be required.

Note: In some cases, a more detailed assessment of potential contaminant sources may be conducted in significant groundwater areas within the study area, such as groundwater recharge areas or areas that are intrinsically susceptible to contamination. If a more detailed assessment is undertaken, the consultant should follow the procedures described in Section 3.3 of this document – "Methodology for WHPA Contaminant Source Assessment".

2.3.1 Contaminant Sources Information Requirements

Information items to consider when conducting the regional contaminant source inventory (CSI):

- ❑ all known sources of contamination;
- ❑ all potential sources of contamination;

- ❑ potentially contaminated sites;
- ❑ high risk activities within or near recharge areas, including bio-solids application sites, garages, salt storage, and sewage treatment facilities;
- ❑ existing monitoring programs;
- ❑ probability of contamination associated with specific land uses; and
- ❑ potentially affected groups or individuals.

Refer to *Schedule D* for a list of common point and non-point potential contaminant sources along with their corresponding North American Industry Classification System (NAICS) codes. Regional contaminant sources must be catalogued using this numbering system.

2.3.2 Minimum Data Source Requirements

At a minimum, the regional CSI should document the location of potential sources from the following existing inventories:

- ❑ MOE Waste Generator database;
- ❑ MOE PCB Database;
- ❑ MOE Waste Disposal Site Inventory;
- ❑ MOE Municipal Coal Gasification Plant Site Inventory;
- ❑ MOE Certificate of Approval (CofA) databases (e.g., soil conditioning sites, landfills);
- ❑ Ministry of Natural Resources Petroleum Well records;
- ❑ Technical Standards and Safety Authority inventory of Underground Storage Tanks (UST); and
- ❑ municipal Official Plans and Land Use Schedules.

2.4 Methodology for Groundwater Use Assessment

This assessment will estimate the degree, purpose, and distribution of groundwater use in the watersheds within a study area to provide an overview of existing pressures on the quantity of local groundwater resources. By estimating current groundwater use, the study will contribute to a future water budget study for the area. A future water budget study would investigate factors influencing the availability of groundwater in the watershed (e.g., water inputs, water losses) and existing and future demands for water supply. Such insight would help water managers to forecast potential water supply shortages and determine what measures are required to maintain groundwater recharge, conserve existing supplies and sustain ecological functions in the watersheds.

2.4.1 Categories of Water Use

Within a given region, a diverse collection of users place demands on the water system. To facilitate the collection and sharing of data it is beneficial to classify water use into standard categories. Seven categories have been established and should be applied in the groundwater study. “Self supply” means water not obtained from a public supply. When possible, include the appropriate North American Industry Classification System (NAICS) codes to describe activities such as prescribed in Schedule D: Catalogue of Suggested Potential Contaminant Sources.

Public Supply	Water withdrawn for all uses by public and private water suppliers and delivered to users that do not supply their own water. Sub-categories of public supply include *residential*, *commercial*, *industrial, institutional,* and *public water use*.

Self Supply, Domestic	Domestic encompasses residential, commercial, and institutional uses. This category also includes water used for mobile homes, hospitals, schools, fire services, air conditioning and other similar uses not covered under a public supply. In addition, amusement and recreational water uses such as snow making and water slides should be included.
Self Supply, Irrigation	Water artificially applied on lands to assist in the growing of crops and pastures or in the maintenance of recreational lands, such as parks and golf courses.
Self Supply, Livestock	Water used by horses, cattle, sheep, goats, hogs, poultry, and other commercially important animals. Water used in fish hatchery operation is also included under this category.
Self Supply, Industrial (manufacturing)	Water used in the manufacturing of metals, chemicals, paper, and allied products.
Self Supply, Industrial (mining)	Water used in the extraction or washing of minerals. For example, solids, such as coal and ores, and fluids such as crude petroleum and natural gas.
Self Supply, Other	Water used for purposes not reported in previous categories.

2.4.2 Suggested Methodology

The cumulative estimate of water use in the study area watershed should be based, at a minimum, on information gathered from major sources, such as: public works and Public Utility Commission records, the MOE Permit to Take Water database, the MOE Water Well Information System, and Certificates of Approval. The suggested use and specific information requirements for these sources are described below. The use of additional sources of information to improve the accuracy of the groundwater use estimates (e.g., other databases, literature review, field survey) is encouraged, and must be documented.

Note: All flow volumes should be recorded in cubic metres or megalitres (ML - millions of litres) per unit time (i.e. cubic metres/month; cubic metres/day).

Public water supplier records – Data on existing uses and outputs in public supply systems should be obtained from the records of local *Public Utility Commissions* and *municipal public works departments*. From water supplier records, the following information is required:

- Water Works number, Certificate of Approval number
- Permit to Take Water number,
- design capacity and permitted capacity
- population served,
- average daily flow (by month), and
- total raw water flow (by month and year).

When available, the following information should also be provided:

- water use by sector (i.e., % domestic, % commercial, % industrial, etc.),
- verification of well and plant Universal Transverse Mercator coordinates (UTMs) or Geographic Positioning System (GPS) reference,
- daily per capita use,
- days when water supply did not meet demand,

- total monthly and yearly flows,
- maximum daily flow (by month),
- minimum daily flow (by month),
- raw water flow, and
- treated water flow.

PTTW database – The MOE *Permit to Take Water (PTTW)* database should be used to inventory uses and estimate water output by permitted large scale users (i.e., > 50,000 litres/day) in areas not serviced by public supply. Groundwater output estimates should be categorized by sector (i.e., self supply domestic, self supply irrigation, self supply industrial, etc.). In addition to obtaining information from the PTTW database, actual water use (not just permitted maximums) should be collected by identifying the large water users and conducting a survey of this sample for an estimate of groundwater use.

From PTTW records, the following information is required:

- permit number,
- general and specific purpose,
- maximum litres/day,
- days per year of taking,
- identify a sub-sample of largest water users by volume, and
- conduct survey of large permitted water users for estimate of actual water use.

At a minimum, the survey should request the following information:

- raw water flow total (by month),
- raw water average daily flow (by month),
- maximum daily flow (actual), and
- consumptive use (especially relevant for industrial users – should be recorded as % of total flow or measured monthly volume consumed).

Self-Supply Water Users (Livestock) – Livestock watering may not be covered in the PTTW database. In order to appropriately estimate water usage, agricultural census data should be used in order to identify the numbers of animals by class. Each class is multiplied by a class water usage (e.g., litres/cow/day). The following information is required: numbers of livestock by class and total raw water flow (year).

Private Individual Wells – The *MOE Water Well Information System (WWIS)* will provide well records for users in the study area watershed, including those that are not serviced by public supply systems, and uses which do not require Permits to Take Water. The WWIS reports multiple uses as first use, second use, third use, etc.. This information may be used as a guide. In some cases, knowledge of hectarage, number of residents, or livestock counts may be helpful for the larger well users. An estimate of private users should be further refined by estimating municipal populations not serviced by a public system and rural population dependent on groundwater (i.e., private wells).

An estimate of average daily flow of groundwater from private individual wells can be made by multiplying the number of private well records in the study area by 175 litres/capita/day (the coefficient for domestic per capita water use). Where information is available, estimates should be categorized by sector.

2.5 Summary of Products for the Groundwater and Aquifer Characterization Studies

The following products and associated data sets or databases should be produced for the study area, using specified data sources, methods, and rules outlined in this document and in *Schedules A to G* as attached:

I. Groundwater and Aquifer Characterization Studies

❑ **Geological Maps**

- Bedrock Geology
- Quaternary Geology
- Surface Topography
- Surface Drainage
- Ground Surface
- Bedrock Surface
- Overburden Thickness
- Sand and Gravel Thickness

❑ **Hydraulic Subsurface Maps**

- Water Table
- Potentiometric Surface
- Aquifer Flow Patterns
- Potential Recharge Areas
- Potential Discharge Areas
- Specific Capacity
- Aquifer Classification (material, confined, unconfined, and semi-confined)
- Water Chemistry

❑ **Three Dimensional Conceptual Geological Framework and Model**

- Catalogue of High Quality Boreholes
- Bibliography of Relevant Literature
- Cross-sections
- Panel Diagrams
- Golden Spike Information
- Golden Curtain Information

❑ **Groundwater Intrinsic Susceptibility (GwIS) Maps**

- Intrinsic Susceptibility Maps (Preliminary, Final Derived, and Harmonized)

II. Regional Contaminant Source Inventory

❑ Potential Contaminant Sources Map and GIS Database

III. Groundwater Use Assessment

❑ An estimate of the total population in the study area by watershed and the percentage of the total population which is serviced by groundwater

- ❑ An estimate of the volume of the daily groundwater availability from the various local aquifer flow systems, and the total groundwater withdrawn per day for all uses in the study area watershed. In addition, a breakdown of uses and demand by sector should also be provided (see classification system provided in this document)

- ❑ A detailed reporting of methods and information sources used (see relevant areas of this document).

3.0 Wellhead Protection Area Studies…

At a local scale, one of the most important areas from a geographic perspective is the surface area and subsurface volume surrounding a water well or well-field that supplies a public water system. It is through this adjacent zone that contaminants are reasonably likely to move toward and reach the well supply. In particular, the production, storage, use, or release of biological and chemical contaminants can present potential risks to groundwater quality in these areas.

3.1 Required Products

Accordingly, an understanding of local groundwater conditions and potential sources of contamination is required. Specifically, all active municipal wells or well-fields in a study area should be investigated, and where lacking,
the following products generated for each one:

- ❑ **Wellhead Protection Area Mapping**, including:

  i) delineation of areas contributing water to each well

- ❑ **Contaminant Source Assessment**, including:

  i) inventory the locations and relative threats to well water quality from existing and historical potential contaminant sources in the Wellhead Protection Areas; and

  ii) assessment of potential contaminant pathways in the identified Wellhead Protection Areas.

3.2 Methodology for Mapping Wellhead Protection Areas (WHPAs)

A wellhead protection area (WHPA) must be delineated (mapped) separately for each municipal well and well-field in the ground water study area. The map should show the time of travel (TOT) capture zones, including attribute (descriptive) data and documentation regarding the model and assumptions used for each WHPA. The boundary for WHPAs should encompass the area at ground surface that overlies the saturated zones from which the water that is pumped from a well or a well-field originates.

The WHPA represents a surface projection of the entire three dimensional capture area for a well. Each WHPA should be sub-divided into ***well capture zones*** to distinguish among the areas of different potential risks posed to well water quality from various types of microbiological and chemical contaminants that could enter the water table and move with the groundwater flow to the well. The zones enable effective and economical management of those risks.

This variation in the risk potential throughout the WHPA results from the fact that bacteria have a limited life span and an adequate travel time from the point of entrance to the well may effectively inactivate these organisms. Similarly, over time, some chemical contaminants degrade into lower risk compounds or are adsorbed by the geological materials encountered along the flow path. On the other hand, other chemicals are stable in a groundwater setting and the risk from their presence may only be attenuated through dilution along the flow path.

At a minimum, three well capture zones should be delineated for each municipal production well or well field:

i) **Zone 1** : 0 to 2 year saturated travel time (TOT). Land uses in this zone need to be managed to avoid all possible risks, including those from bacteria and viruses.

ii) **Zone 2** : 2 to 10 year TOT. The main focus of the land use management in this zone should be to minimize risks from all chemical contaminants, however, the bacterial and viral risks may still be a concern.

iii) **Zone 3** : 10 to 25 year TOT / Zone of Contribution. The land use management in this zone needs to address risks from persistent and hazardous contaminants.

In addition, within Zone 1, a 50-day TOT area should be identified to recognize potential risks from day-to-day activities of the water utility itself, and other potential contaminant sources from municipal activities or infrastructure.

The size of well capture zones is influenced by the well pumping rate, aquifer porosity, and hydraulic conductivity. The size and shape of the zones are influenced by hydraulic gradient and flow direction, by dissolution features such as in karst geology, and the orientation and density of fractures or faults or both. The identified capture zones need not extend beyond aquifer flow boundaries. However, they may do so where the existing topographic features or geologic structure can funnel contaminants towards the aquifer flow zone because of the combination of a relatively impermeable geology and a surface slope which is directed towards the aquifer flow zone.

Note: Capture zones in rock aquifers often extend for many kilometres. In such situations, checking residence times by means of water chemistry and isotope analysis can help ensure that time of travel estimates are not excessive (e.g. where the water is thousands of years old, the defined zone of contribution may be overly large).

3.2.1 Capture Zone Delineation Methodology

Preferred Method – In the majority of cases, three-dimensional, steady-state computer models should be used to delineate capture zones. When properly set-up and calibrated, these models produce the most realistic time of travel boundaries. It is anticipated that the numerical code that will most frequently be used is MODFLOW. It is necessary to have data regarding well production rate, the aquifer's lateral extent, thickness, hydraulic conductivity, and flow gradients. Assumptions made in developing the model and the details of model sensitivity analyses must be provided in the final report. It is the only method for accurately delineating capture zones where there is a significant presence of: (1) discrete fractures, (2) anisotropy, (3) spatial variations in hydrogeologic parameters, (4) vertical movement of water and variation in total hydraulic head with depth, and (5) changes in water levels seasonally or during other time period measurements.

Exceptions to the requirement for applying three-dimensional models should only be considered where site-specific conditions suggest that any of the other methods described below are more appropriate and justified from a technical standpoint.

Analytical method – Analytical methods use equations to define groundwater flow, and require site-specific estimates of transmissivity, porosity, hydraulic gradient, hydraulic conductivity, and saturated aquifer thickness. Flow system mapping using analytical models to estimate time of travel may be sufficient for conservative estimates of capture zones. Two-dimensional wellhead delineation models,

such as WHPA and WhAEM, are available free of charge from the U.S. EPA.

Note: Flow system boundaries may include both, physical boundaries (limits of the aquifer and structural features such as fault-block walls, zones of fractures zones, and topographical features), and hydrological features (rivers, canals, wetlands, and lakes). This method requires detailed mapping of the water table, on which flow lines are drawn perpendicular to the water-table elevation lines. Flow system boundaries can also be used with TOT calculations to help ensure that the zone of contribution is not unacceptably large. However, in an aquifer with fractures, this is only appropriate if the aquifer acts like a uniform porous medium.

Uniform Flow Method – This method uses the following group of analytical expressions to delineate capture zones (*asterisk (*) means multiply*):

1) Distance to down-gradient null point:
X_L = **Q / (2 * π * K * b * i)**
2) Shape of outer streamline:
X = **- Y / tan [(2 * π * K * b *i) / Q * Y]**
Where the boundary limit (asymptotic width) of the capture zone:
Y_L = **± Q / (2 * K * b * i)**
The width of the capture zone is extended to the ultimate recharge area and can be made to conform to variability in the mapped flow direction.
3) Upgradient distance as a function of time:
X_t = **K * i * (t / n)**

Where:
X = distance along length of capture zone
Y = width of capture zone as a function of "X"
Q = maximum approved pumping rate of the well
K = hydraulic conductivity
b = saturated thickness of screened interval
i = hydraulic gradient
t = saturated travel times for each well capture zone
n = porosity
π = 3.14156....

These formulas can be calculated in a standard spreadsheet and this method is more flexible than standard analytical models since it can conform to variability in flow direction. The disadvantage is that this method generally does not take into account hydrological boundaries (streams, lakes, etc.) and aquifer heterogeneities, and it assumes no recharge. Also, it is limited to two-dimensional analyses of flow systems and capture zone delineation.

Calculated Fixed Radius Method – This method, also known as the "cylinder method", is easy to use and is based on simple hydrogeologic principles that require limited technical expertise. However, this method tends to overprotect down-gradient and under protect up-gradient areas because it does not account for regional gradients. Unless combined with flow system mapping, this method should not be used for unconfined aquifers or for confined aquifers with a sloping potentiometric surface. Calculated fixed radius capture zones are circular areas whose radius is determined using the formula (*asterisk(*) means multiply*):

r = square root [(Q * t) / (π * b * n)]

where: r = radius (distance from well) in metres
Q = maximum approved pumping rate of the well
t = saturated travel times for each well capture zone
b = saturated thickness of screened interval
n = porosity
π = 3.14156...

Note: Where an aquifer characterization study is not being undertaken, the intrinsic susceptibility to contamination of the aquifer(s) supplying water to municipal wells should be assessed to at least 500 metres beyond the limit of capture Zone 3. Intrinsic susceptibility to contamination is to be evaluated by considering the thickness and permeability of the material above the water supply aquifer. The thickness of the overlying formation(s) is important, since any contaminants that are applied, deposited, or spilled on or near the ground surface will be less attenuated and will reach an aquifer more quickly where formations are thin. Low permeability surficial soils, composed largely of clay and silt, are generally less likely to transmit significant quantities of contaminants than high permeability soils such as sand and gravel. However, fractures or other openings in an aquitard overlying the aquifer could negate natural protection. Where bedrock is exposed at surface, the ground surface will be considered to be the top of the aquifer since the intrinsic susceptibility to contamination will be highly dependent upon the degree, inter-connectivity, and orientation of the fractures.

3.3 Methodology for WHPA Contaminant Source Assessment

An inventory of existing and historical potential contaminant sources should be conducted in each Wellhead Protection Area (WHPA). The purpose of this contaminant inventory is to identify past, present and future (proposed) activities that are current or potential threats to groundwater quality. When complete, the inventories will provide the basis for targeting pro-active management of all potential risks in WHPAs, and could identify the need to examine whether mitigation measures are required.

Schedule D contains a list of common point and non-point potential contaminant sources along with their corresponding North American Industry Classification System (NAICS) codes. Potential contaminant sources must be catalogued using this numbering system.

3.3.1 Required Contaminant Source Information

Information items to consider when conducting the CSI include:

- all known sources of contamination;
- all potential sources of contamination;
- potentially contaminated sites;
- inventory of related land uses and zoning designations;
- inventory of high risk activities within or near recharge areas;
- inventory of potential contaminant pathways**;
- existing monitoring programs;
- probability of contamination associated with specific land uses; and
- potentially affected groups or individuals.

***Note: The most common potential pathways to penetrate confining layers and migrate into the aquifer are improperly constructed, maintained, and abandoned wells; and excavations such as gravel pits, dug-out ponds, utility trenches. While abandoned wells and excavations are not actually considered contaminant sources, they are included in this inventory as they may create a conduit for contaminants*

to move downward from the surface or upward from deeper geologic formations. Information on all such potential pathways should be collected at the same time as the contaminant source inventory.

3.3.2 Required Methods

At a minimum, the Wellhead Contaminant Source Assessment should be based on three sources of information:

1. **existing inventories** such as the MOE inventory of PCB storage sites, MOE inventory of hazardous waste generators, and county or municipal plan Land Use Schedules;

2. a **land use survey** to identify land use activities that can be classified according to their potential as contamination sources using North American Industry Classification System (NAICS) codes where applicable; and

3. a **field survey** of all WHPAs, especially where existing information is sparse or contradictory, or where high-risk land use is suspected.

Review of existing inventories – The assessment of potential sources of contamination will make use of a number of existing inventories on file with the Ministry of the Environment, Ministry of Natural Resources, and the County and Municipality offices. The studies should include information from all of the following sources:

- MOE Waste Generator database;
- MOE PCB Database;
- MOE Waste Disposal Site Inventory;
- MOE Municipal Coal Gasification Plant Site Inventory;
- MOE Water Well Record Database;
- Ministry of Natural Resources Petroleum Well records;
- Technical Standards and Safety Authority inventory of Underground Storage Tanks (UST); and
- county and municipality Official Plan Land Use Schedules.

Suggested potential contaminant sources, and typical North American Industry Classification System (NAICS) codes are presented in *Schedule D: Catalogue of Suggested Potential Contaminant Sources*. NAICS coding is also available over the internet at www.naisc.com.

Land use survey – Following a review of existing inventories as outlined above, a land use survey should be conducted within all identified WHPAs. Land assessment maps should be obtained from the County or Municipality offices and used to identify land uses in the study area and potential contamination sources associated with the identified land uses and their coding. Zoning maps, land use schedules and business directories should also be utilized to assist in identifying specific potential sources of contamination. For specific land uses and activities that are associated with potential sources of contamination the inventory should identify the appropriate NAICS coding (refer to *Schedule D* and www.naisc.com. Where a location includes multiple land uses, each use should be documented.

Field survey and questionnaire – Following a review of available information, a field survey should be conducted. The survey may involve conducting visual inspections from the street through the WHPA noting any potential contamination sources seen that were not identified during the review of existing databases or during the land use review. In particular, note any old gas stations or evidence of pump islands, locations where water is ponding, long term auto or machine repair sites, and chemical storage

locations. A field survey can clarify previously-examined sources of information which have yielded conflicting information; or situations where insufficient information is available for a given location.

A door-to-door survey questionnaire should also be completed for all industrial, commercial, or institutional facilities located within WHPAs. *Schedule E* contains a sample survey questionnaire. A detailed summary of survey results should be included in the final report. Submission of raw data (i.e., completed questionnaires) is not required.

4.0 Reporting Requirements and Minimum Data Standards ...

4.1 General Reporting Requirements

All funded studies will be required to submit the following to the Ministry of the Environment (MOE):

- ❑ Quarterly updates, a summary report, and a full final report, including all maps and associated data, to the specifications detailed in the specific portions of this Terms of Reference document.

- ❑ Three written copies of the summary and final reports, as well as one electronic copy in a recent version of Corel WordPerfect format or Microsoft WORD format and one electronic copy in Adobe Portable Document Format (PDF).

- ❑ Electronic file copies of all tabular and mapping data (i.e., database files, GIS files) must also be submitted with the final reports according to the general and specific data standards noted in this document, or where standards have not been explicitly stated**,** in the format within which they were created.

4.2 Data Standards

Upon completion of the Groundwater Studies, all data (source and derived data) including both spatial and tabular data will be submitted with the final reports in digital format conforming to the data standards summarized below. These standards represent the minimum data standards required for the Groundwater Studies. These standards are complementary to the descriptions of the methods, rules and products to be delivered under the studies. Collection of data beyond these standards must also be included in the final submission of data.

The standards have been subdivided into general and specific standards. General standards apply to all data sets whereas specific standards refer to the individual data sets. Please refer to the other appendices for description of methodologies to follow for the derivation of each of these data sets.

The use of the minimum standards will ensure that there is consistency across the various groundwater studies, the data can then be used as a baseline for future studies, and the data can be used in conjunction with other existing data for a variety of other purposes.

Data sharing agreements are mandatory to facilitate the transfer of existing digital information to study areas.

General Standards – The standards which follow apply to all data submitted as part of the groundwater studies.

- All data will be submitted digitally upon completion of the final reports.
- Each theme must have a metadata description consistent with the Land Information Ontario (LIO) Directory. The metadata record should describe the methodology used to generate the derived data and layers including gridding algorithm, source data sets used, etc..
- Each theme should include the source of the input data.

- All spatial data such as points, lines and polygons should be registered to the Land Information Ontario (formerly OBM) base at a 1:10,000 scale in Southern Ontario and a 1:20,000 in Northern Ontario.
- Spatial data must be submitted using a NAD83 datum conforming to the Canadian National Transformation.
- All spatial vector data should be submitted in an ESRI-compatible format (i.e., Arc/Info coverages or ArcView shapefiles, using universal transverse mercator (UTM) coordinates (double precision) and NAD83.
- All spatial vector data should include the spatial accuracy (refer to *Schedule F*).
- All spatial raster data should be submitted as Arc/Info coverages (GRIDS) or ASCII Grids using UTM coordinates (double precision) and NAD83.
- All tabular data should be submitted in a recognized RDBMS or comma delimited formats containing the minimum attribute information referred to in the specific data standards.
- The data sets must be documented including column titles, field type, field length, and a detailed description of what data is collected for each field. The vendor should include listings and descriptions of "lookup" tables used in collecting and entering the data.
- If the tabular data supports a spatial data set, primary keys must exist within both sets of data and be documented. Where tabular data is not associated with a spatial coverage, the file must include a UTM Zone, Northing, and Easting. The coordinate data should be in NAD83.
- Any errors or discrepancies with existing data sets should be documented and reported back to the source .

Specific Data Standards - In addition to the general standards listed above, the minimum standards that apply to the specific data sets are outlined in *Schedules F and G*. Where formal or interim standards exist, they will be utilized. Otherwise a minimum set of attributes will be required for each of the data sets as set out in *Schedules F and G*. Any errors or discrepancies should be reported back to the data supplier.

5.0 Definitions ...

The following Definitions apply throughout this document:

Aquifer means a geological formation, group of formations or part of a formation which stores and transmits a useable quantity of water. Aquifers can consist of porous material of relatively high hydraulic conductivity (sand, gravel), or fractured/karstic rock.

Aquifer Vulnerability means groundwater or an aquifer's intrinsic susceptibility to contamination, including both human and natural water quality impacts. Intrinsic susceptibility, in its simplest form, is a measure of the natural protection of an aquifer and to some degree surface water resulting from overlying layers with low permeability.

Capture Zone means an area surrounding a pumping well that will supply groundwater to the well within a specified period of time. Zone of Contribution means the entire area within which the water that is pumped from a well originates.

Saturated Time of Travel means groundwater travel time in the saturated zone that is needed to travel a specific horizontal distance. It does not include vertical infiltration through the unsaturated zone.

Surface Water means water bodies (lakes, wetlands, ponds - including dug-outs), water courses (rivers, streams), infiltration trenches and areas of temporary precipitation ponding.

Well Field means a clustering of two or more groundwater production wells which supply water to communal distribution system(s). The wells must be sited on a single property or directly adjacent properties and can be installed within a single or multi-aquifer system.

Wellhead Protection Area (WHPA) means the ground surface area and subsurface volume surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and eventually reach such water well or wellfield.

Schedu e A

Required Groundwater and Aquifer Characterization Components with Methodologies

Aquifer Mapping - Subsurface Geologic Information				
Information	**Data Sources**	**Method**	**Rules for methods and presentation**	**Products**
Topographic Map & Drainage Surface	MNR DEM & base mapping - 1:10,000 & 1:20,000 Relevant surface water, water well and borehole point data	Use 5 km buffer zone for the designated study area Use NAD 83 Digital Elevation Model Complete local hydrologic conditioning of provincial DEM for deriving water table elevations	This means that the base DEM has been conditioned using stream data (particularly flow direction, baseflow, water temperature data and known springs). This conditioning allows the stream, lake, wetland, and other water feature data to take priority over point or contour data during the generation of the DEM and any elevation data points which conflict with descent of each drainage system are ignored.	Topographic, drainage surface and hydrologically conditioned DEM
Bedrock Geology	MNDM map at 1:1,000,000 scale		Use the MNDM legend, and appropriate stratigraphic legend	Bedrock Geology Map with MNDM legend showing borehole data
Quaternary Geology	MNDM will provide 1:50,000 quaternary maps	MNDM creates a seamless quaternary map	Use the MNDM master provincial legend	Quaternary Geology Map with MNDM legend showing borehole data
Borehole Geologic Logs	Water Well Information System MNDM geophysical cores MTO boreholes Geological Survey of Canada geophysical cores petroleum well information from MNR – Petroleum Resources Section Geophysical data- downhole geophysics logs, seismic profiles landfill borehole information from MOE MNDM open files and field notes associated with the maps hydro transmission line data	Compare ground surface (MNR DEM) with MOE estimated ground surface Standardize geological descriptions from water well records using GSC geomaterials protocol (see Schedule B) Apply stratigraphic principles to develop conceptual geological framework When sand & gravel at surface, default to OGS definition	• Remove wells with greater than 10m difference with OBM • Use screened water wells - remove from analysis all wells with UTM or elevation reliability code more than 6 • Screen out wells with no elevation • Screen out wells with no location - (unless excellent source then field check)	Standard geomaterial data set for the study area High quality subsurface point data

Information	Data Sources	Method	Rules for methods and presentation	Products
	municipal projects boreholes			

Information	Data Sources	Method	Rules for methods and presentation	Products
Bedrock Surface	• water well records from MOE • bedrock topography maps MNDM	Use these in developing the bedrock surface, do kriging or contouring of wells to bedrock, or use inverse distance, with software	Show wells used for contouring on the map. as well as fault, fracture and karstic areas. Show quarries and mines.	Bedrock surface map with fault, fracture and karstic areas. Record of paleodrainage.
Overburden thickness	• bedrock surface • ground surface	Subtract contoured bedrock surface from contoured ground surface	Show streams running on rock and gravel pits.	Map of overburden thickness (isopach)
Sand & Gravel Thickness	• water well records • petroleum wells • ARIP maps	Sum sand and/or gravel from the water well record: Create isopach in 5 metres vertical intervals for a scale of 1:50,000.	5 metres continuous thickness to be used for indication of aquifers	Preliminary indication of aquifer presence and isopach thicknesses.
Aquifer Mapping - Hydraulic Subsurface				
Water Table	DEM water well records monitored wells lake and river (baseflow streams) fabric baseflow data and known springs stream monitoring	• Select well data representing the water table. • Do histograms and variance testing on the data, • Krig water table elevation surface. • Correct water table elevation surface to groundwater surface when above ground. • Calculate depth to water table surface by subtracting water table elevation from ground surface, and use DEM Where appropriate: - tie to monitored data	Choose appropriate shallow wells. Use histograms, variance testing and statistical analysis where appropriate for water levels, associated aquifer and well depths (min. and max.). Use in preparing GwIS maps (refer to Section 2.0)	Water table point data for cross-sections Water Table Surface

Information	Data Sources	Method	Rules for methods and presentation	Products
Potentiometric Surface - Direction of Flow	DEM water well records need stratigraphic model from high-quality data for an improved map	-Create from deeper wells Do histograms and variance testing on the data, Evaluate gradients and flow direction for each of the aquifer units identified	Do histograms, variance testing and statistical analysis of water levels, associated aquifer and well depth minimum and maximum. Choose appropriate deeper wells	Potentiometric surface and direction of flow for each aquifer unit identified and discharge areas and potential linkages to surface water
Downward Vertical Gradient (Recharge)	• water table layer • potentiometric layer for each aquifer unit Use nested piezometer data where available	Water table is higher than potentiometric surface of an underlying confined layer - identify hummocky areas (closed drainage system) as potential recharge - consider karstic effects		Map and cross-sections showing potential recharge and discharge areas and potential linkages to surface water
Upward Vertical Gradient (Discharge)	• water table layer • potentiometric layer • baseflow surveys • (see Hinton, 1996) Use nested piezometers where available	Water table may be at a lower elevation than potentiometric surface of an underlying confined layer	Show flowing wells	Map of discharge and discharge areas and potential linkages to surface water
Potential Discharge Areas	• interpolated water table • ground surface • MNR wetlands, CAs • Temperature data – CAs • Aquatic Resource Areas – MNR • Spawning areas - MNR	Plot areas where water table is higher than ground surface elevation Includes areas adjacent to streams where baseflow, geomorphology and indicators present	Show springs	Map of potential discharge and discharge areas and potential linkages to surface water

Information	Data Sources	Method	Rules for methods and presentation	Products
Specific Capacity Maps	Water well, irrigation wells and pump tests including municipal wells, waste sites monitoring wells and permitted wells under PTTW	Pumping rate by draw down Correct for well losses, partial penetration, and mutual interference	Undertake pumping test to refine maps if pump test information is not recent Steady state and transient conditions should be defined	Compilation of high quality point data set. Maps of municipal wells with specific capacity noted
Development of Geological Model - Other Required Items				
Water Divides	Streams – drainage map Faults – structural geology Pumping test data	Pump Tests - identify recharge boundaries	Topographic map has the water divide on it	DEM with surface water divide Subsurface flow divides
Cross Sections, Panel Diagrams	Water well records Petroleum records Geotechnical logs	Develop a 3D geological model, draw cross sections based on classification system of materials Minimum of 2 cross sections Where variability of the material and the complexity of the geology is difficult to interpret this should be indicated in the presentation notes or legends Identify significant data gaps.	Cross sections must be interpreted and documented Use Sharpe et al for classification of materials Cross sections must be oriented parallel and perpendicular to groundwater flow directions and include all surface water and drainage features where appropriate	Compilation of high quality point and continuous subsurface data set. Conceptual geomaterials framework for further development of the stratigraphic model and associated groundwater occurrence & migration
Golden Spikes (High quality geophysical and stratigraphic boreholes.)	Geotechnical logs with geophysical info	Contact OGS/GSC for existing sites or drill golden spikes (critical geological cores) to develop the stratigraphic model applying the International Stratigraphic Guide 1994, Geological Society of America	Contact Regional staff, OGS and GSC to determine best location of drilling site and follow standard GSC method for logging information	Compilation of high quality point data set.

Information	Data Sources	Method	Rules for methods and presentation	Products
Golden Curtains (High quality seismic data)	Several golden spikes and seismic information will form a golden curtain	Use existing and new golden spikes to develop the stratigraphic model applying the International Stratigraphic Guide 1994, Geological Society of America		Compilation of high quality continuous subsurface data set.
Groundwater and Aquifer Intrinsic Susceptibility				
Areas sensitive to groundwater contamination	• water well records and boreholes • GSC Geomaterials Protocol • K-Values and K-Factors from Schedule C • Groundwater Intrinsic Susceptibility Index (ISI)values are calculated for intrinsic susceptibility for each borehole/well location	general outline: Intrinsic Susceptibility to Contamination • score is derived by adding index values calculated for each hydrogeological unit for a defined effective thickness (i.e., water table, first aquifer, 15m, etc.) • index value calculated by multiplying the thickness of each unit and a representative K-Factor • K-Factor is assigned to K-Values generally representative of the exponent of saturated vertical hydraulic conductivity of the unit when expressed in m/s	*A* - Determine and sum depth of units to water table, effective thickness, or 15m. *B* - Calculate ISI values - Use borehole data - Apply GSC Geomaterial Protocol from Schedule B - Apply The Generic Representative Permeability (K- Factor) Table from Schedule C -show ISI values on maps *C* - Use thresholds in Section 2.2.4: Categorizing ISI Values	Preliminary, final derived, and harmonized maps of intrinsically susceptible areas – high, medium and low Corresponding data sets

Schedule B

GSC Geomaterial Protocol

There is a need to standardize the descriptions of subsurface material as reported in water well and other borehole data. We recommend that the Geological Survey of Canada (GSC) Geomaterial Protocol be used to help build improved muncipal hydrogeological data sets for further analysis and interpretation.

The GSC Geomaterial Protocol provides the basis for a standardized approach to material descriptions for all borehole information used in a groundwater study. The protocol is best applied at the outset of a project and directly to borehole data sets received from various agencies. The coding routine is best used within a relational database structure (e.g SiteFx software). Use of a relational database facilitates the standardizing of a large number of boreholes and information such as the 212 fields in the MOE water well records.

The coding protocol was developed by geologists who re-coded material descriptions found in provincial water well records. The records allow for the use of three fields for drillers to enter material descriptions; however, only one field was used in most records. To partly compensate for this problem, the geologists linked re-coding rules to the many thousands of field sites they observed during geological mapping studies. In 1998, the GSC published the results of their extensive testing program as part of database developed through the Oak Ridges Moraine Hydrogeology Project. One conclusion of the re-coding and field testing was that the “clay” descriptions are over represented compared to their occurrence in the field, by a factor of 10. This is a significant finding because “clay” material is often used as a key factor in determining groundwater vulnerability.

A description of the geomaterial protocol to be used in municipal groundwater studies funded by the province is found in the following reference:

Standardization and assessment of geological descriptions from water well records: Greater Toronto and Oak Ridges Moraine Areas, southern Ontario , Russell, H. A. J., Brennand, T. A., Logan, C., and Sharpe, D. R., 1998, Current Research 1998-E: Ottawa, Geological Survey of Canada, p. 89-102.

The Ontario Ministries of the Environment, Natural Resources, Mines and Northern Development contribution have been acknowledged in the reference. The reference is available through the internet site at: http://sts.gsc.nrcan.gc.ca/orm/acrobat_data.asp.

The abstract and tables 1, 3 4. and 5 are presented here, followed by the suggested method for documenting the Metadata for the GSC Geomaterial Protocol.

Abstract

Archival drilling records from water wells, geotechnical, mineral exploration, and hydrogeologic studies provide subsurface information for regional geologic and hydrogeologic investigations. This paper evaluates methods by which water well material descriptions may be standardized. In Ontario, material descriptions are reported in three attribute fields using 82 terms, thus theoretically permitting over 500,000 permutations. Materials descriptions are rationalized to 10 classes then reclassified according to two methods: (i) First-Attribute Method (FAM), and (ii) Rule-Based Method (RBM). The first-attribute method is presently applied by hydrogeologists in southern Ontario and uses only the first attribute field; it is a simple, effective method able to broadly delimit aquifers and non-aquifers. The rule-based method applies conditional rules developed from regional geologic models. This method is more geologically accurate, and is recommended where water well data are to be integrated into geologic and hydrogeologic investigations. Successful applications are summarized and general recommendations

made.

Schedule B (continued)

Table 1 - General Description of MOE Water Well Record Fields (Total Fields = 212)			
Header	**Geology**	**Hydrogeology**	**Construction**
Well Number (2)	Unit - Depth to Top (24)	Piezometer Indicator (1)	Casings (18)
Municipality (2)	Unit - Colour (24)	Water - Depth Found (5)	Screens (8)
Concession – Range (4)	Unit - Materials (3x24)	Water - Kind (5)	Plugs (6)
Lot (2)		Test Method (1)	
Owner (1)		Pumping (2)	
Completion Date (3)		Levels (2)	
UTM Location (4)		Pumping/Recovery Indicator (1)	
Elevation (2)		Level During Pumping (4)	
Basin (5)		Flow Rate (1)	
Water Use (2)		Clear - Cloudy (1)	
Drill Method (1)		Recommended Setting (1)	
Data Source (1)		Recommended Rate (1)	
Contractor Code (1)		Specific Capacity (1)	
Date Received (3)		Final Status (1)	

Schedule B (continued)

Table 3 - Rationalized Descriptors for MOE WWIS. (%- usage in all 3 materials data fields)				
Rationalized Descriptor	**MOE Dataset Descriptor**			
1 bedrock (0.1%)	18	sandstone	40	flint
	20	quartzite	41	gneiss
	21	granite	42	greywacke
	22	greenstone	43	gypsum
	26	rock (bedrock)	44	iron fm.
	36	basalt	45	marble
	37	chert	46	quartz
	38	conglomerate	47	schist
	39	feldspar	48	soapstone
1.1 limestone (0.8%)	15	limestone	16	dolostone
1.2 shale (0.9%)	17	shale	82	shaly
	19	slate		
2 gravel (9.7%)	11	gravel	31	coarse gravel
	12	stones	32	pea gravel
	13	boulders	72	gravelly
	29	fine gravel	87	stoney
	30	medium gravel		
3 sand (12.3%)	7	quicksand	10	coarse sand
	8	fine sand	28	sand
	9	medium sand	81	sandy
4 silt (1.5%)	6	silt	84	silty
5 clay (16.1%)	5	clay	61	clayey
6 diamicton (0.5%)	14	hardpan	34	till
7 organic (0.1%)	3	muck	33	marl
	4	peat	35	wood frags.
8 fill (3.7%)	1	fill	25	overburden
	2	topsoil		
9 previously dug (0.7%)	0	unknown	24	previously drilled
	23	previously bored		
99 null (53.6%)	27	-		

Schedule B (continued)

Table 4: Geologic Descriptions and Usage - example : ORM	
Geologic Description	**Usage %**
99 no obvious material code	0.15
11 covered; missing; previously bored	0
10 fill (incl. topsoil, waste)	13.29
9 organic	0.15
8 clay, silty clay	21.21
7 silt, sandy silt, clayey silt	2.52
6 sand, silty sand	28.68
5 gravel, gravelly sand	14.89
4 clay-clayey silt diamicton 4-1 clay-clayey silt diamicton, stoney	0.22
3 silt-sandy silt diamicton 3-1 silt-sandy silt diamicton, stoney 3-3 diamicton, texture unknown	13.90
2 silty sand-sand diamicton 2-1 silty sand-sand diamicton, stoney	0.41
1 bedrock 1-1 limestone 1-2 shale 1-4 dolomite 1-5 potential bedrock 1-7 interbedded limestone/shale	4.58

Examples of geological reclassifications based on the application of conditional rules presented in Table 5

Descriptor 1	Descriptor 2	Descriptor 3	RBM reclassification
Bedrock			Bedrock (1)
Clay	Gravel		Silt diamicton (3)
Silt	Shale		Shale (1-2)
gravel	sand		Gravel (5)

Schedule B (continued)

General Process for Applying the GSC Geomaterials Protocols to a Borehole Database

MAIN STEPS

I. Simplify Descriptor Strings:

I.1. If organic has an accompanying descriptor, then organic is treated as null (see I.5).
I.2. If clay occurs with sand or gravel, then clay is treated as silt.
I.3. If bedrock descriptor is not for the last unit of the well or not with continuous bedrock beneath, then bedrock is treated as gravel.
I.4. If clay or silt is with shale, then clay and/or silt is treated as null (see I.5).
I.5. Remove duplicate attributes and spaces; eliminate all leading null fields.

II. Apply Global Rules

II.1. If a single descriptor, then the description is based directly on that descriptor (see Table 4).
II.2. If till in any field, then treat as diamicton (see Subroutine A below).
II.3. If gravel is in any field with no bedrock and clay is not first descriptor, then treat as gravel.
II.4. If fill and previously dug in any field are without bedrock, then treat as fill; else with bedrock, then treat as potential bedrock.
II.5. If all fields are null, then treat as no obvious material code.
II.6. If previously dug or fill are in any field except with bedrock, then treat as fill.

III. Apply Bedrock Rules

(Apply if last unit in well or if continuous bedrock beneath)

III.1. < 5 m depth, bedrock anywhere then code = bedrock (see Subroutine B below for categories)
III.2. > 5 m depth, bedrock anywhere and gravel anywhere then code = gravel
III.3. > 5 m depth, bedrock anywhere and sand/silt/clay and no gravel then code = diamicton (see Subroutine A below)

IV. Apply Sediment Texture Rules

IV.1. Attribute 1 = sand with attribute 2/3 = silt or clay and no gravel, then treat as sand
IV.2 Attribute 1 = silt with attribute 2/3 = sand or clay and no gravel, then treat as silt
IV.3 Attribute 1 = clay with attribute 2/3 = sand or silt and no gravel, then treat as silt

SUBROUTINES

Subroutine A: Determine Diamicton Texture

(Use textural sand-silt-clay attribute in highest attribute position)

1. If sand, then treat as silty sand diamicton
2. If silt, then treat as silt diamciton
3. If clay, then treat as clay silt diamicton
4. If no texture indicated, then treat as silt diamicton

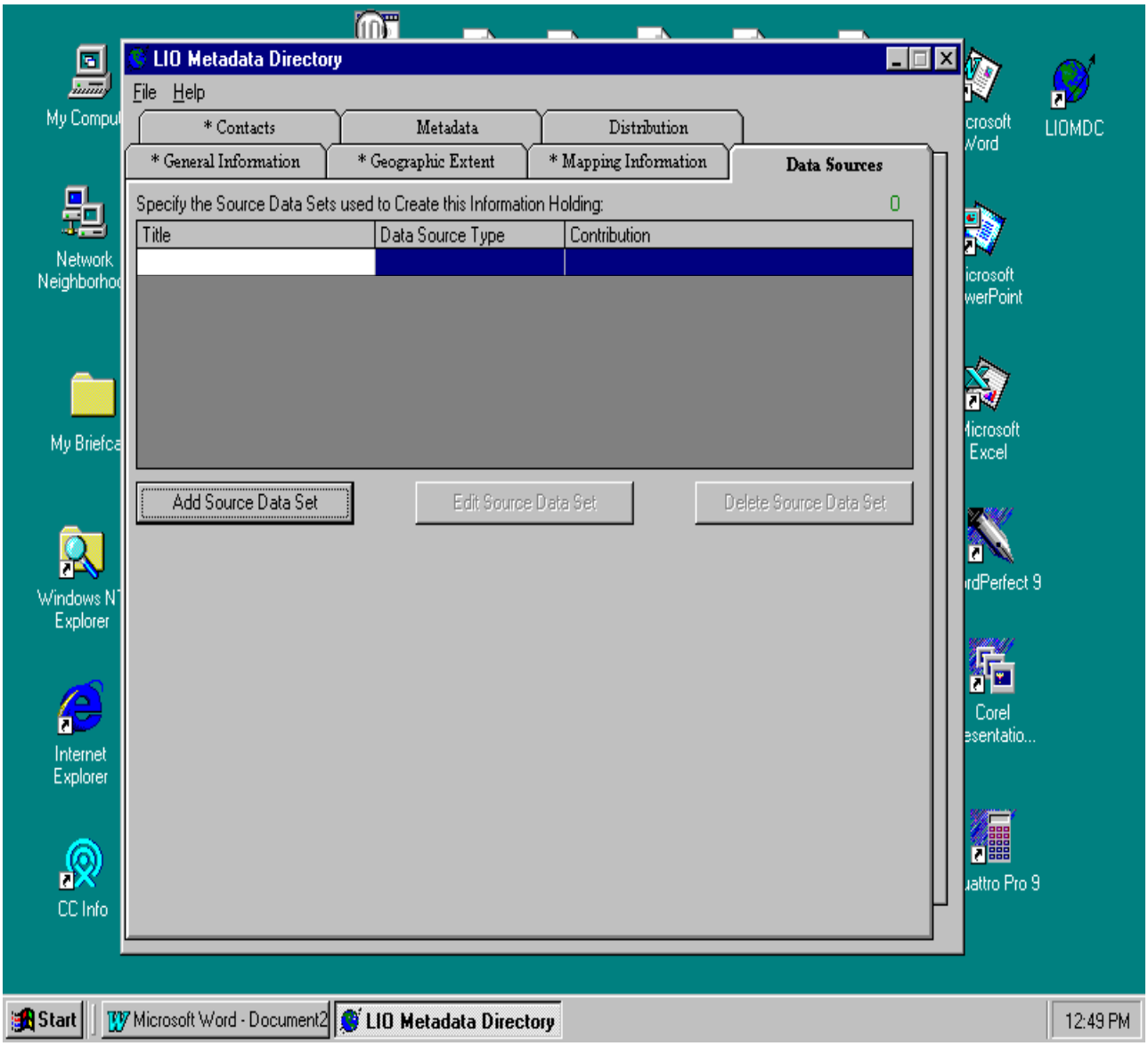
Subroutine B: Determine Bedrock Lithology

1. If bedrock in any field and not with limestone or shale, then treat as bedrock
2. If limestone in any field and not with shale, then reclassify as limestone
3. If shale in any field and not with limestone, then reclassify as shale
4. If limestone and shale in any field, then reclassify as interbedded limestone - shale

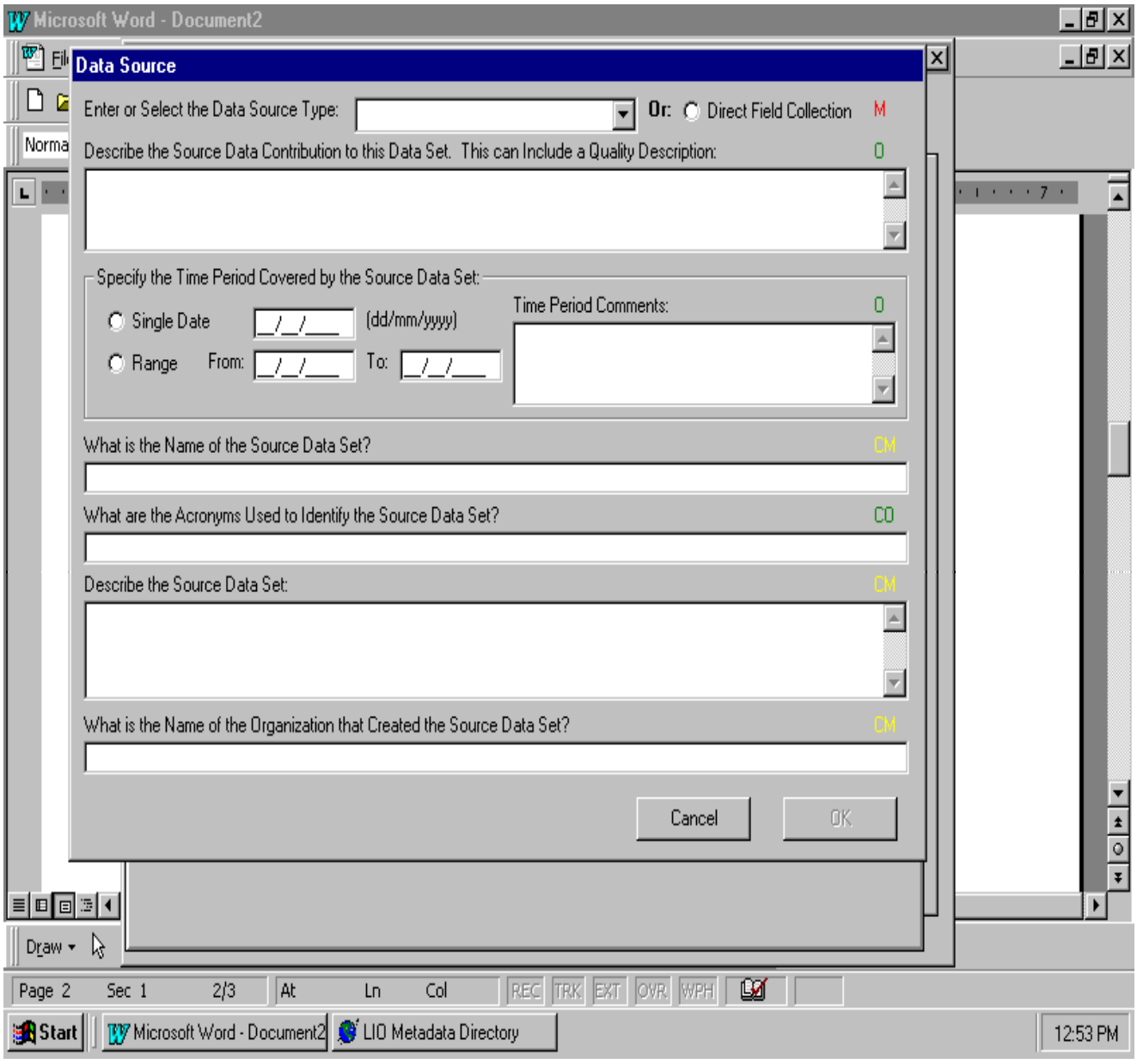
Schedule B (continued)
Metadata for the GSC Geomaterial Protocol

(1) As per the provincial standards, GO-ITS metadata format is used by the Ministry of the Environment to catalog the maps, tables and databases (including GIS data layers) coming out of the studies for the LIO data directory (see web site www.lio.mnr.gov.on.ca).

(2) The “Data Sources” field (which is an optional field, as it currently stands) can be used to cite the GSC Geomaterial protocol, which should be used to simplify the MOE water well records describing borehole material. This would be an essential step in producing data layers such as Aquifer Distribution & Thickness, Overburden Thickness, Bedrock Topography, Aquifer ISI, Aquifer Recharge Area (Surficial Sands & Gravel) etc. A screen shot of the “Data Sources” field is given below.



(3) If you click on “Add Source Data-Set”, a detailed template as shown below will appear. Details about this protocol can be described here, including its contribution towards the creation of the specific data set to which this metadata applies. This data set can be one of the data layers described above (i.e. Aquifer Distribution & Thickness, Aquifer Intrinsic Susceptibility, etc.).



Schedule B (continued)

4. For example, to create an “Aquifer Intrinsic Susceptibility” data set, you may require (in addition to the GSC Geomaterial Protocol) the MOE Water Well Records as well as MNR Digital Elevation Model (DEM). Hence, the “Data Sources” corresponding to the Aquifer Intrinsic Susceptibility metadata descriptors would include descriptions about MOE Water Well Records, MNR-DEM and GSC Geomaterial Protocol. Listed below is the Lineage information (equivalent to “Data Sources”) pertaining to the Aquifer Intrinsic Susceptibility data set as provided in the Oxford County’s metadata descriptors (FGDC Content Standard was used prior to LIO Metadata standard application).

Lineage:

Source_Information:
Source_Citation:
Citation_Information:
Originator: Ontario Ministry of the Environment (comp.)
Publication_Date: Unpublished
Title: Water Well Record Database
Geospatial_Data_Presentation_Form: Tabular Digital Data
Type_of_Source_Media: Disc
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 00001931
Ending_Date: 00121999
Source_Currentness_Reference:
Current as of October 2000 (last cut of the database prior to the generation of the AVI data).
Last borehole construction date entered in the database was December 1999.
Source_Citation_Abbreviation: None
Source_Contribution:
Includes borehole records which were interpreted and used in the generation of the Aquifer Intrinsic Susceptibility Index data.
Source_Information:
Source_Citation:
Citation_Information:
Originator: Ontario Ministry of Natural Resources
Publication_Date: Unpublished
Title: Oxford County Digital Elevation Model (10 metre resolution)
Geospatial_Data_Presentation_Form: Arc/Info Grid
Type_of_Source_Media: Disc
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 00002000
Source_Currentness_Reference: Current until new data becomes available.
Source_Citation_Abbreviation: None
Source_Contribution:

Used to extract surface elevations at each borehole location in the Water Well database.

Schedule C

Generic Representative Permeability (K-Factor) Table

Geomaterial	Representative K-Factor (dimensionless)*	K-Value (m/s) @75% range**	Highest K-Value (m/s)
gravel	1	1.00E-01	0.1
weathered dolomite/limestone		1.00E-06	
karst		1.00E-03	
permeable basalt		1.00E-03	
sand	2	0.01	1.00E-02
peat (organics)	3	1.00E-03	1.00E-03
silty sand		1.00E-04	
weathered clay (<5m below surface)		1.00E-04***	
shrinking/fractured & aggregated clay		1.00E-04***	
fractured igneous metamorphic rock		1.00E-05	
weathered shale		1.00E-05***	
Silt	4	1.00E-06	1.00E-06
loess		1.00E-06	
limestone/dolomite		1.00E-06	
weathered/fractured till	5	1.00E-07	1.00E-07
diamicton (sandy, silty)		1.00E-07***	
diamicton (silty, clayey)		1.00E-08***	
sandstone		1.00E-07	
clay till	8	1.00E-09***	1.00E-09
clay (unweathered marine)		1.00E-10	
unfractured igneous and metamorphic rock	9	1.00E-13	1.00E-13

* Representative K-Factors are relative numbers and do not correspond directly to the exponent or index of the observed K-Values for the geomaterial in the group.

** Correspondence with descriptors of observed K-Values in Freeze & Cherry 1979, Prentice-Hall. Derived using the length of the line to determine the 75% value and rounding to the highest K-Value.

*** Estimated value based on field studies in Ontario

NOTE: When actual study area data is available, this chart should be used to assign the corresponding K-Values for locally defined geomaterial (e.g., Mayhill Till) and then apply the appropriate Representative K-Factor in the calculation of the index of the groundwater intrinsic susceptibility to contamination .

Schedule D
Catalogue of Suggested Potential Contaminant Sources

Number	Decription	Typical NAICS* Codes
1	**Agricultural pesticide, herbicide, and fertilizer storage, use, filling, and mixing areas**	115000, 422910, 325320
2	**Airport maintenance and fueling sites**	488119
3	**Animal watering troughs located near unfenced wells and springs that attract livestock**	112990
4	**Beauty salons**	812112
5	**Boat builders and refinishers**	336612
6	**Chemical reclamation facilities**	562910, 324191
7	**Concrete, asphalt, tar, and coal companies**	327331, 325520,
8	**Dry cleaners and laundromats**	812300
9	**Exfiltration lagoons**	562219
10	**Feed lots and animal feeding operations with more than ten animal units**	112112
11	**Food processors, meat packers, and slaughter houses**	31160, 422470
12	**Fuel, oil and heating oil distributors and storage sites (above ground and underground storage tanks - residential, commercial and retail)**	422710, 213112
13	**Funeral homes, mortuaries, cemeteries (grave yards)**	812210, 812220
14	**Furniture strippers, painters, finishers, and appliance repairers**	81142
15	**Golf courses, parks, and nurseries**	71391, 71219o, 942120
16	**Industrial manufacturers: chemicals, pesticides, herbicides, paper/leather products, textiles, rubber, plastic, fiberglass, silicone, glass, pharmaceutical, and electrical equipment, etc.**	233310, 233310, 31-330000
17	**Junk and salvage yards, wreckers**	333923
18	**Land application of manure, sewage sludges, fertilizers, pesticides**	562212, 112112
19	**Machine shops, metal platers, heat treaters, smelters, annealers, and descalers**	332710
20	**Manure piles**	112112
21	**Medical, dental, and veterinarian offices**	621111, 621210, 541940
22	**Mining operations (including tailings and waste rock piles)**	212399

Number	Decription	Typical NAICS* Codes
23	**Municipal wastewater treatment plants**	22131022132
24	**Pesticide and herbicide storers and retailers**	422910
25	**Pipelines**	486110
c26	**Photo processors and print shops**	323114, 325992
27	**Railroad yards**	488210
28	**Research laboratories**	541710, 325412, 62151,
29	**Residential pesticide, herbicide, and fertilizer storage, use, filling, and mixing areas**	5.61730422910e+17
30	**Road salt and sand-salt storage facilities and areas where road salt is applied**	488490, 212393, 560000
31	**Sand and gravel mining operations**	212321
32	**Sewer lines**	221320
33	**Septic tank/drain-field systems**	22132
34	**Sites of reported spills**	562910
35	**Smelting and refining of non-ferrous and precious metals**	331400, 331500, 333511, 31-330000
36	**Snow dumps**	561730
37	**Stormwater impoundments, dug-out ponds**	221310, 234990, 562998
38	**Transportation corridors on which spills could occur or road salt applied**	484230, 484220, 488490, 48-490000
39	**Vehicle body shops, dealerships, maintenance garages, small engine repair shops, muffler shops, quick lubes, service stations, rental companies, rust proofers, tire shops, and car/truck washes**	811121, 441110, 811111, 811411, 811112, 81198, 811192
40	**Waste disposal sites (private, municipal, industrial), waste transfer stations, industrial waste storage areas, waste injection wells, landfills, dumps**	562219, 562212, 562112
41	**Wells (Active and abandoned)**	213000, 221310, 422490
42	**Wood preservers**	321114
43	**Other potential contaminant source (chemical)**	31-33000, 325411, 422690
44	**Other potential contaminant source (biological)**	110000, 325320, 541380, 621511, 422210, 324412, 325132

*NAISC - See www.naics.com for more information and detailed codes. The appropriate code can be searched for by code number or activity description and an appropriate code shall be selected on the basis of a land use and/or potential contaminant source inventory. See *Schedule E* for further details regarding contaminant source inventory.

Schedule E

Sample Contaminant Survey/Questionnaire

(Insert name of study region here)
Groundwater Study **Date:**_____
Business/Chemical Use Inventory **Please fax to (phone #) by:**_____

1. Facility Information
Facility Name:_____ ☐ Completed at time of visit
Street Address:_____ ☐ Left for business to complete
Georeferenced Location: Latitude:_____ Longitude:_____ ☐ Not completed
Person Interviewed:_____
Title:_____ Phone:_____
Name for the Mailing:_____ Title:_____
Mailing Address:_____
City:_____ Prov:_____ Postal Code:_____
Did you know your facility is located close to a municipal well? ☐ Yes ☐ No
If known, please indicate any previous facilities on the property._____

2. Type of Service/Product **NAICS code: _____**
(refer to Terms of Reference, *Schedule D*)

Facility Type:

☐ Office ☐ Restaurant ☐ Medical ☐ Agriculture: Livestock Operations
☐ Gas Station ☐ Industry ☐ Dry Cleaner ☐ Agriculture: Crops/Nursery
☐ Computers ☐ Waste Management ☐ Automotive ☐ Printer/Photo Processor

3. Materials Handling

How do you dispose of waste? ☐ On site ☐ Off site
Is spill cleanup equipment available? ☐ Yes ☐ No
Is there a septic system on site? ☐ Yes ☐ No ☐ Unknown
Are there floor drains in the shop? ☐ Yes ☐ No ☐ Unknown

Any wells on site?
Industrial Use Well ☐ Number of Wells:_____
Abandoned/Unused Well ☐ Number of Wells:_____
Irrigation Well ☐ Number of Wells:_____
Drainage Well ☐ Number of Wells:_____
Drinking Water Well ☐ Number of Wells:_____
Observation Well ☐ Number of Wells:_____

Is there an Environmental Mgt System in Place? ☐ Yes ☐ No Date Initiated_____

Microbiological Contaminants Storage

	Estimated Volume	Type of Storage Container			Physical State (Sol/Liq/Gas)
		Earthen	Concrete	Metal	
Biosolids (e.g., pulp/paper waste)	_____	❑	❑	❑	_____
Septage	_____	❑	❑	❑	_____
Sewage Sludge	_____	❑	❑	❑	_____
Agricultural Manure	_____	❑	❑	❑	_____
Other Animal Waste	_____	❑	❑	❑	_____

Organic Contaminants Storage

Liquid / Solid	<25L (<5 gal) <25Kg	25-250L (5-50 gal) 25-250Kg	250-2500L (50-500 gal) 250-2500Kg	>2500L (>500 gal) >2500Kg	Above Ground Tank	Below Ground Tank	Physical State (Sol/Liq/Gas)
Petroleum Products	❑	❑	❑	❑	❑	❑	_____
Insecticides/ Herbicides	❑	❑	❑	❑	❑	❑	_____
Brake/Transmission Fluid	❑	❑	❑	❑	❑	❑	_____
Acids/Bases/Caustics	❑	❑	❑	❑	❑	❑	_____
Paints/Dyes/Stains	❑	❑	❑	❑	❑	❑	_____
Cleaning Solutions (soap, detergents, etc.)	❑	❑	❑	❑	❑	❑	_____
Chlorinated Solvents (degreasers, dry cleaning fluid, TCE, etc.)	❑	❑	❑	❑	❑	❑	_____
Other Solvents (MEK, MIBK, acetone, varsol, etc.)	❑	❑	❑	❑	❑	❑	_____
Film Chemicals	❑	❑	❑	❑	❑	❑	_____
Registered Wastes (PCBs, asbestos, etc.)	❑	❑	❑	❑	❑	❑	_____

Inorganic Contaminants Storage

	Estimated Volume	Physical State (Sol/Liq/Gas)
Fertilizers	_____	_____
Salt	_____	_____
Other_____	_____	_____

5. Landscape Application of Materials

	Yes	No	Estimated Area of Application
Nutrients (manure, biosolids)	❑	❑	_____
Fertilizers	❑	❑	_____
Pesticides	❑	❑	_____
Salt (e.g., paved surfaces)	❑	❑	_____
Other _____	❑	❑	_____

Comments:_____

_____

_____

_____

_____

_____

_____

_____

_____

Schedule F

Required Data Standards

In addition to the general standards listed elsewhere in the Technical Terms of Reference, the following minimum standards apply to the specific data sets. Where formal or interim standards exist, they will be utilized. Otherwise a minimum set of attributes will be required for each of the data sets below.

Any errors or discrepancies should be reported back to the data supplier.

Table 1: Specific Data Standards

Information	Data Standards	Minimum Attributes	Comments
Topographic Map & Drainage Surface	Existing LIO standards (1:10000 & 1:20000) *www.lio.mnr.gov.on.ca	As per existing standards	Vector
Bedrock Geology	Existing LIO standards (Bedrock at 1 million) *www.gov.on.ca.mndm/mines	As per existing standards	Vector - polygon or line
Quaternary Geology	Existing LIO standards (Quaternary Geology OGS for 1:50 000 *www.gov.on.ca.mndm/mines	As per existing standards	Vector - polygon or line
Ground Surface	Existing MNR DEM standards	Elevation - in metres above sea level	Raster
Bore holes to use if available	New boreholes drilled in the groundwater studies must have a water well record Submitted data must conform to water well information system and SiteFX standards for additional information (such as geotechnical info) also use new petroleum resource water data *www.earthfx.com	Refer to water well information system or SiteFX documentation	Vector - Points Wells utilized in analysis must be identified for each derived data layer and included in documentation

Information	Data Standards	Minimum Attributes	Comments
Bedrock Surface		Bedrock elevation - in metres above sea level of the bedrock Fault Line	Raster surface with faults identified as vectors (lines)
Overburden Thickness		Depth in metres	Raster
Sand & Gravel Thickness	OGS/GSC standards GSC Geomaterial Protocol see Schedule B *www.sts.nrcan.ca:80	Depth in metres Type of material (e.g. sand, gravel)	Raster
Water Table		Depth to water table in metres	Raster
Potentiometric Surface- Direction of Flow		Potentiometric gradient - Flow direction	Raster - gradient Vector - flow
Downward Vertical Gradient (Recharge)		Potentiometric gradient	Raster
Upward Vertical Gradient (Discharge)		Potentiometric gradient	Raster
Potential Discharge Areas		Potential discharge area	Raster
Water Divide		Water divide - streams - geological faults	Vector - line
Golden Spikes/ Curtains	Refer to OGS/GSC standards		Vector - points - lines
Area Sensitivity to Contamination	Refer to Section 2- methodology for K-Values, K-Factors and	Index - actual index value Index class - low,	Raster

Information	Data Standards	Minimum Attributes	Comments
	GSC Geomaterial Protocol Schedule B	medium or high	
Time of Travel Well Capture Zones	Refer to Section 3.0	Zones	Vector - polygons
Regional/WHPA Potential Contaminant Sources	Refer to schedule for list of potential contaminant sources North American Industry Classification System NAICS codes www.naics.com	Potential contaminant source type Activity type	Vector - points, polygons
Regional/WHPA Land Use	North American Industry Classification System NAICS codes *www.naics.com	Land Use type Activity type	Vector - polygons
Well Integrity Assessment	MOE WWIS	Location, construction date, elevation, flooding potential, casing depth/height above ground, well depth, depth to water producing zones, screened interval	Vector - points
Water Wells	Refer to SiteFx standards *www.earthfx.com	Specific Capacity Pump Test etc.	Vector - points
Pathways Inventory		Pathway type	Vector - points, lines, polygons
Groundwater Use	Required data fields: well name being pumped, well name monitored, date, time, reading of water depth, water level units (metres) Formatted as a date/time field.		Table form
Metadata	Land Information Ontario Metadata Standards	Data sources, processes, etc.	database/ directory

Information	Data Standards	Minimum Attributes	Comments
	*www.lio.mnr.gov.on.ca *www.gov.on.ca/mbs/techstan /72-00.htm		

* suggested web sites

Other web references and contacts:

http://gsc.nrcan.gc.ca/esv/canadasurficial/cansurf.htm (Geology - federal)

http://sts.gsc.nrcan.gc.ca (Geographic names)

Scott Christilaw- 705-755-1870 - Ontario WRIP Water Resources Information Project

Cathy Owen or Terry Carter - 519-873-4642 - Ontario Petroleum Resource - Water Records Database

Frank Kenny - 705-755-2155 - Ontario Digital Elevation Model

Cam Baker, Ross Kelly, or Peter Barnett - OGS - Ontario geology

Schedule G

Base Themes from OLIW* Map Browser

Name of Theme	Originating Concrete Class
Geographic Township	Geographic Township
Concession	Concession
Lot	Lot
Transmission Line	Utility Line
Pipeline	Utility Line
Rail Line	Railway
Rail Line Abandoned	Railway
Water Tank	Tank
Petroleum Tank	Tank
Pit	Pit or Quarry
Pile	Pit or Quarry
Lock	Water Structure
Airport	Airport
Tower	Tower
Contour	Contour
Lake/River	Waterbody Segment
Stream	Waterbody Segment
Road	Road Segment
Road Edge	Transport Line
Tertiary Road	Road Segment
Utility Line	Utility Line
Railway	Railway
MNR Area	MNR Area
Settlement	Settlement at 100K
Waterbody Name	Waterbody Segment

*OLIW - Ontario Land Information Warehouse. See www.lio.mnr.gov.on.ca

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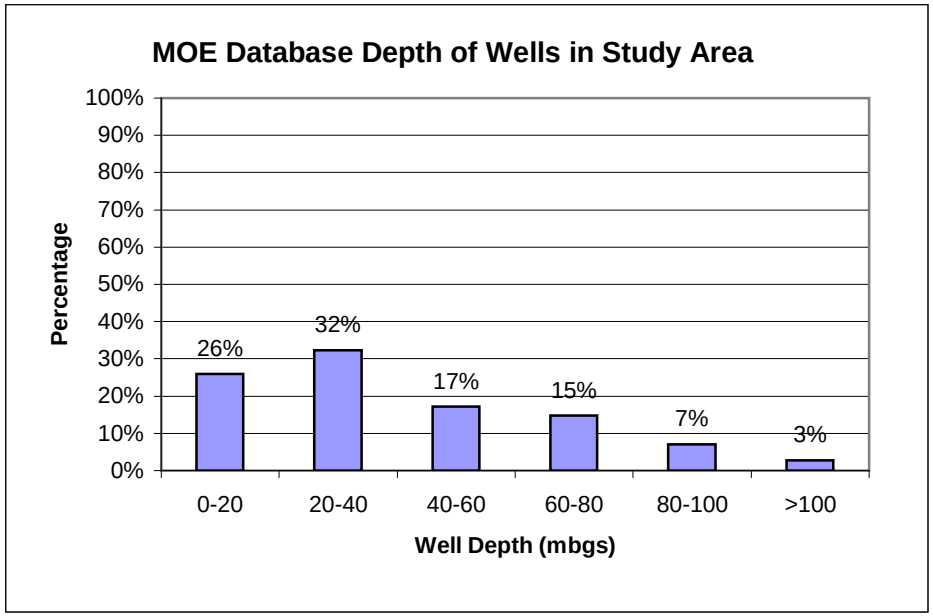
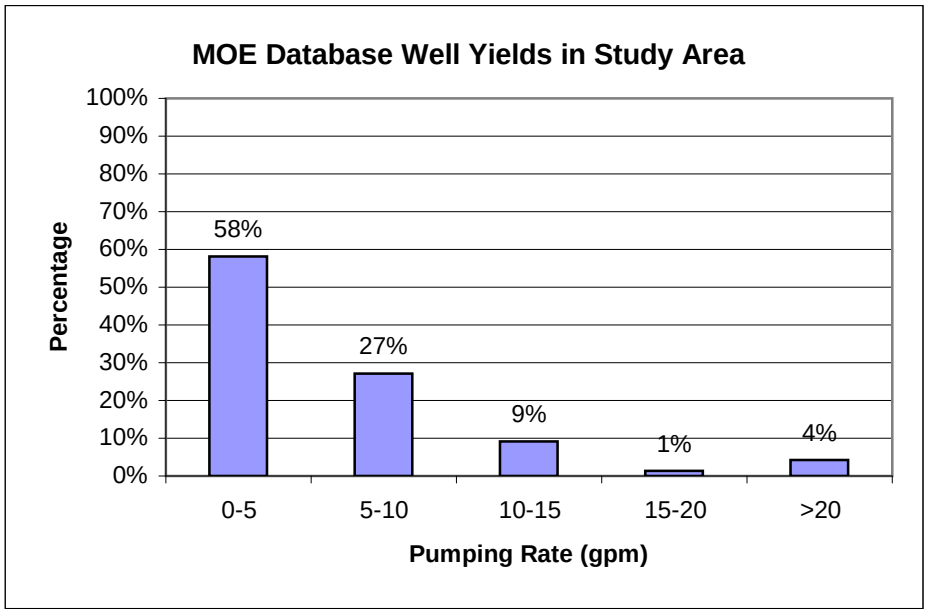
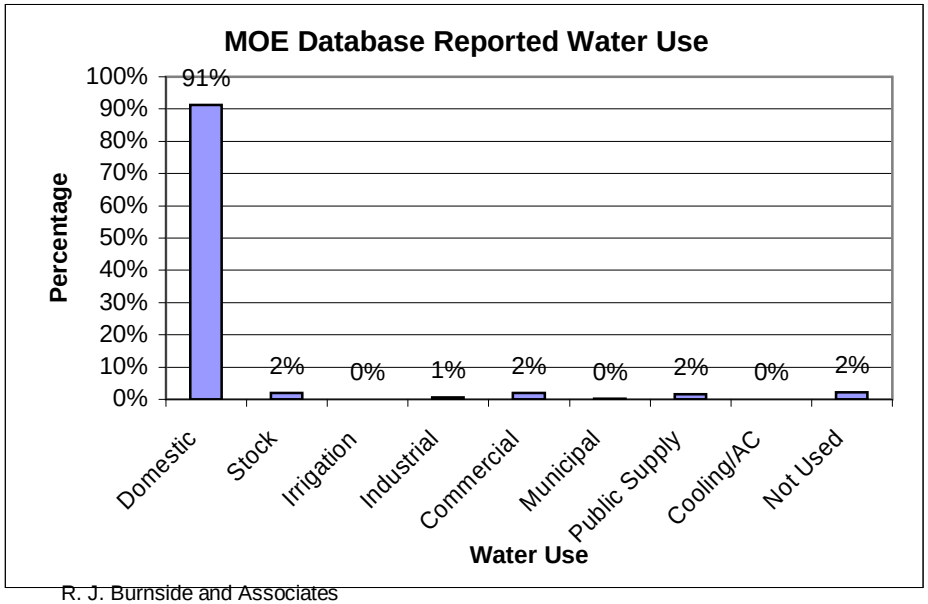
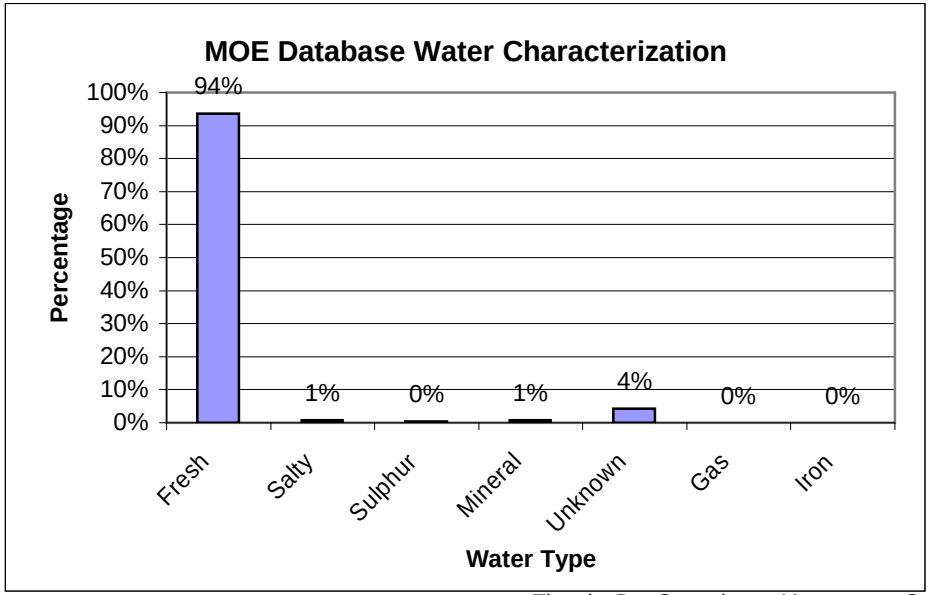
Appendix B
MOE Water Well Summary

Figure B-1
Thunder Bay Groundwater Management Study
MOE Database Analysis in the Thunder Bay Study Area





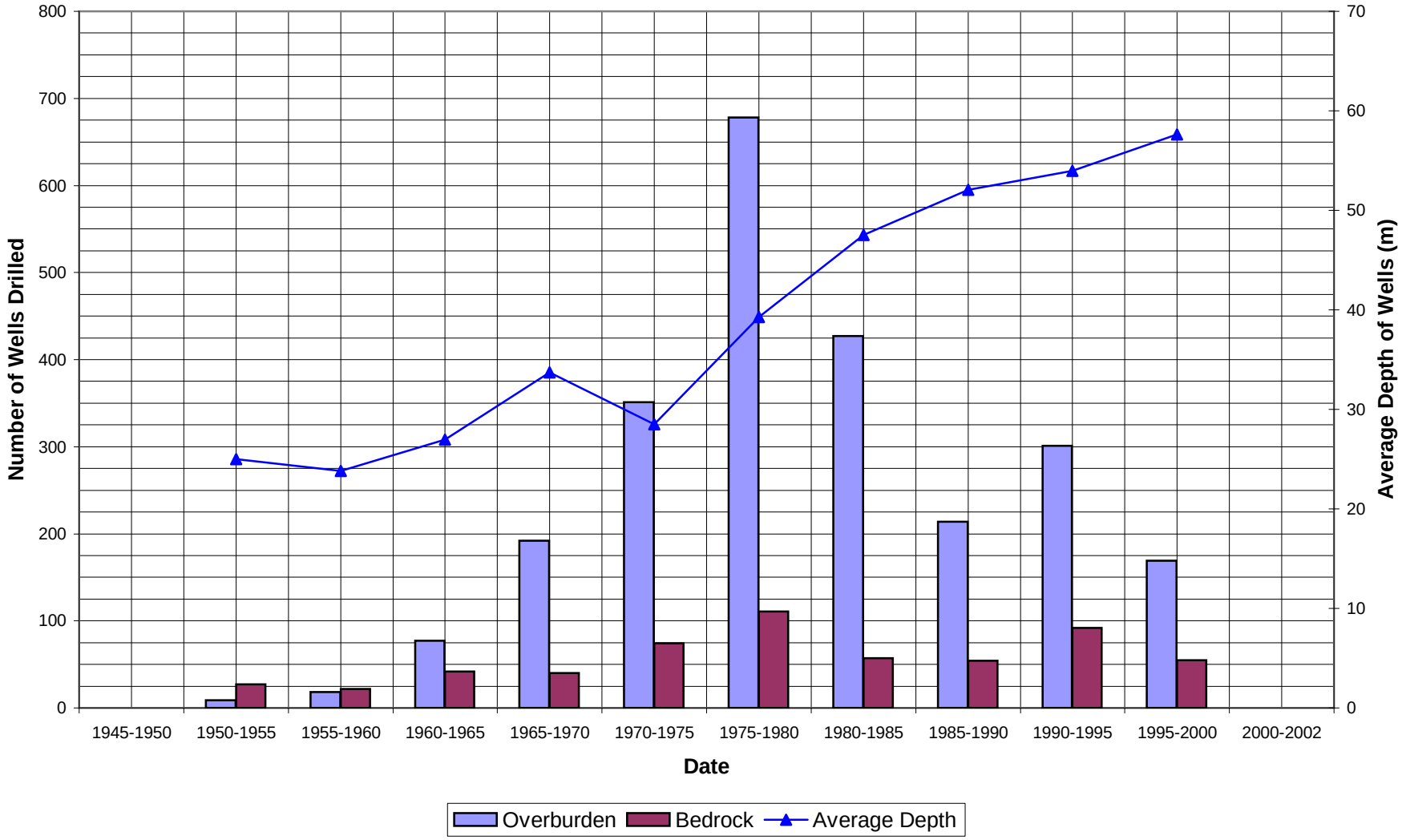




R. J. Burnside and Associates
File: Z:/HA034966 (Thunder Bay)/Well Record Analysis/Thunder Bay Well Record Analysis.xls/Charts for Presentation
Prepared By: C. Reynolds
Printed On: 8/9/2005

Thunder Bay Groundwater Management Study
Project# HA 03 4966
October, 2004

Figure B-2
History of Groundwater Development in Thunder Bay Study Area



RJ Burnside & Associates
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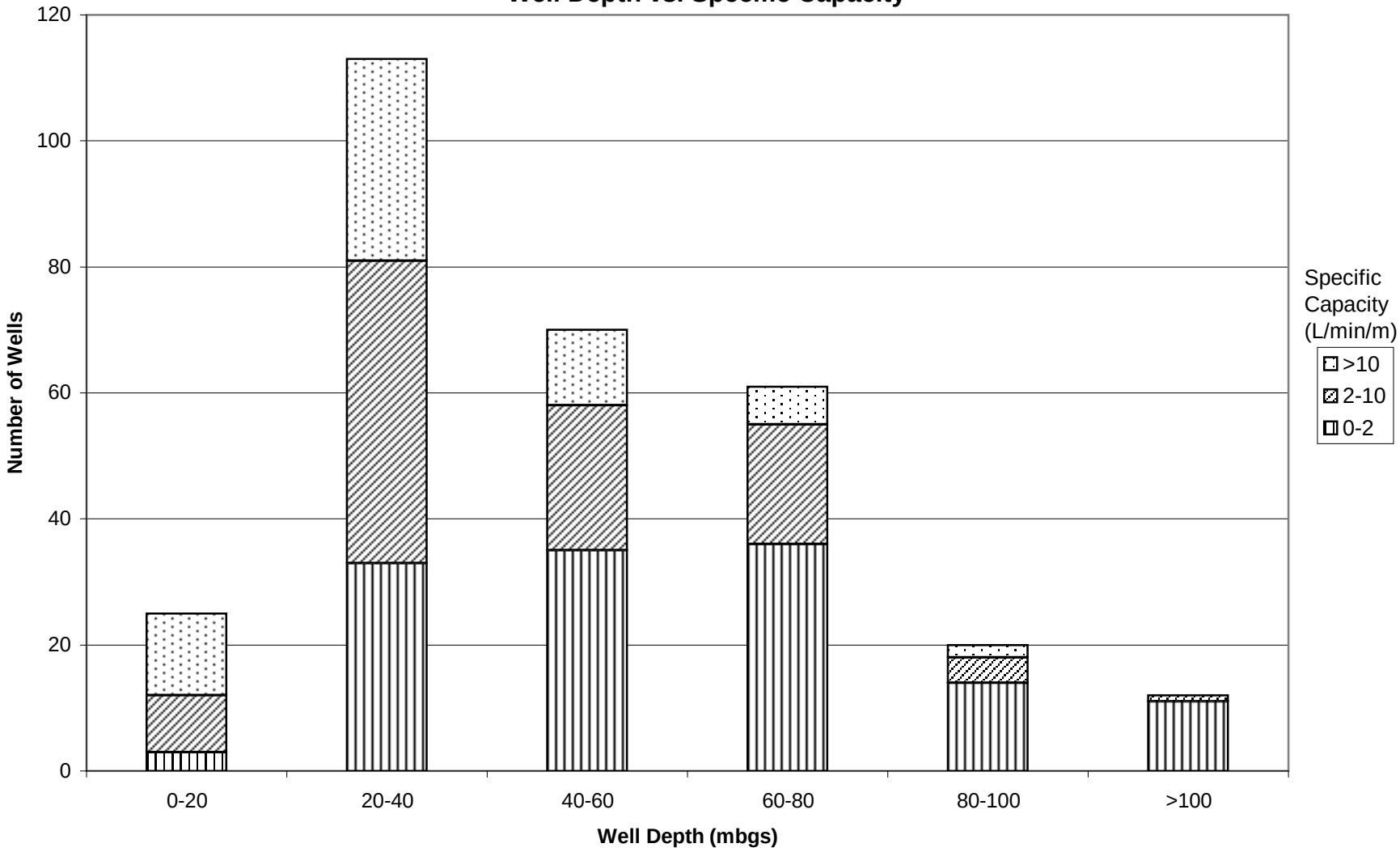
Prepared by: CR
Printed On: 8/9/2005

Thunder Bay Groundwater Management Study
Project# HA 03 4966
May, 2004

Figure B-3
Thunder Bay Groundwater Management Study
Well Depth vs. Specific Capacity



Burnside
File: Z:/HA034966 (Thunder Bay)/Well Record Analysis/Specific Capacity.xls/Depth vs spec cap
Prepared By: C. Reynolds
Printed: 8/9/2005

Thunder Bay Groundwater Management Study
Project# HA 03 4966
October, 2004

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Appendix C
Meeting Agendas and Open House Information

Meeting Agenda

The Lakehead Region Area Conservation Authority
Thunder Bay Area Groundwater Management Study
Technical Advisory Committee Meeting No.1

Date: **June 23, 2003; 3pm to 5pm**
Venue: AMEC E&C Services office,
95 North Cumberland Street
Thunder Bay

1. Welcome/Introductions

2. Project Description and Project Organization

3. Work Plan and Budgets
   - A) Study Area Definition
   - B) Schedule and Budget
   - C) Existing Data
   - D) Specific Issues and Concerns
   - E) Community Involvement (Open House)

4. Municipal Well Information

5. Other Business

6. Next Meeting

A:\0823agenda.wpd

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PROJECT Thunder Bay Area Groundwater Study.

FILE NO. 1TA-03 4966. DATE June 23, 03.

NAME TIME 3:00 PM.

Technical Advisory Committee Meeting.

	Name	Addres	Tel No.	Email
✓1	Steve Suke LRCA.			
✓2	Mervi Henttonen. LRCA.			lakeca@tbaytel
3	Margeret L Welshe	RR#1 Nolalu, ont. (POT 2RO)	ph: 807-473-49	
✓4	Victoria Kosny LRPB	P.O RR# 59, Murillo, Ont	P0T 2G0	807 935-33
✓5	BILL BARTLEY	209 WINNIPEG AVE - TH BAY	P 713 327	BBARTLEY@TBAYTEL.NET
✓6	Ellen Cromm, NMAH	Suite 223 425 S. James St. Thunder Bay P7E 6S7	(807)473-3025	ellen.cromm@mnr.gov.on.
✓7	Leslie McEachern	City of Thunder Bay Planning Division	(807)625 2947	lmceachern@City-thunder-bay.on.
✓8	John Petrunka	Mun. of Neebing - Council RR#7 Thunder Bay Ont.		
✓9	Kerri Marshall.	Home ph 807-964-2020 - office 807 474 5331 City of Thunder Bay Engineering Division - 111 Syndicate Ave S. PO Box 800 TB. ON		
10			807(625)-2444	Kmarshall@city.thund-bay.on.ca
✓11	Tony Pacifico	Thunder Bay District Health.	626-2524	tony.pacifico@tbdhu.com.
✓12	Abraham Drost, MNDM		(807) 475-1368	abraham.drost@ndm.gov.on.ca
✓13	LeeAnn Nygard.	RR#1 Kakabeka Falls, ON Conservation Authority, O'Connor Township	(807)475-8966	leeshawn@tbaytel.net
✓14	Rudy Buitenhuis	OMAF		Rudy.Buitenhuis@omaf.gov.on.ca
✓15.	ED CHAMBERS	RR#1 DORION ON P0T 1K0	(807)857-2265	

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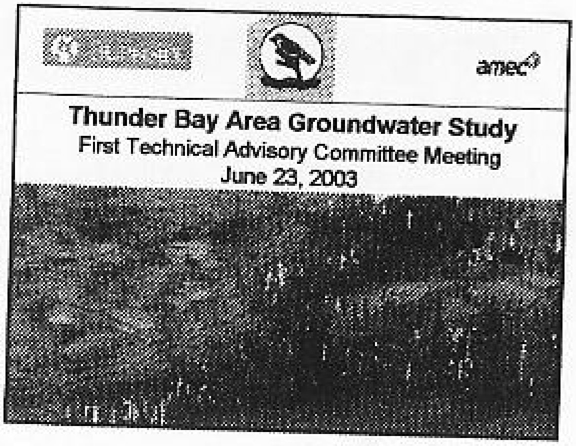
PROJECT

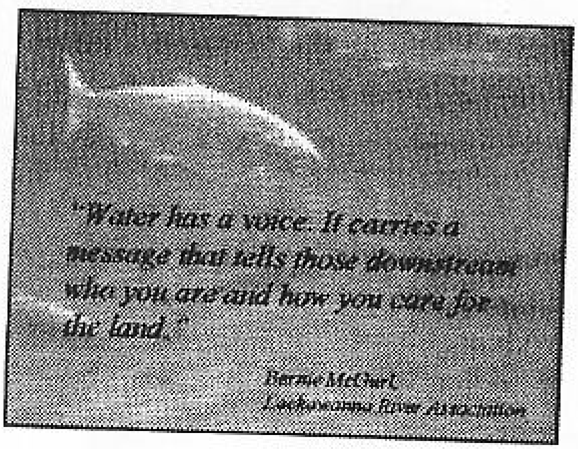
FILE NO. DATE

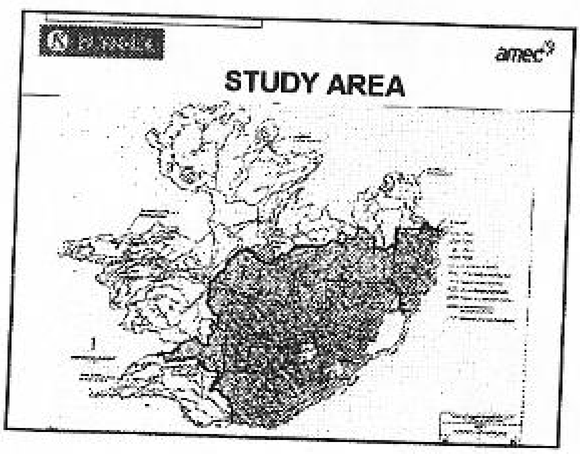
NAME TIME

Monica Anthony } AMEC
Peter Rider

Bindu Upaluri } RTB
Gary Williams

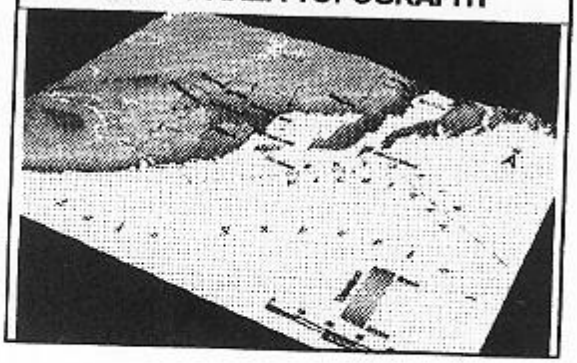

amec
Thunder Bay Area Groundwater Study
First Technical Advisory Committee Meeting
June 23, 2003


"Water has a voice. It carries a message that tells those downstream who you are and how you care for the land."
Bernie McGurl,
Lackawanna River Association

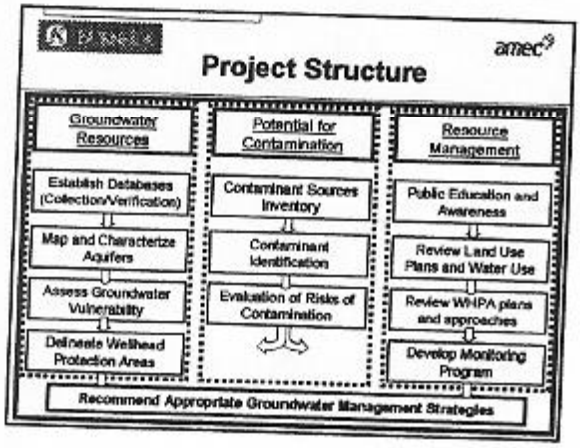

amec
STUDY AREA

STUDY AREA TOPOGRAPHY

STUDY AREA TOPOGRAPHY



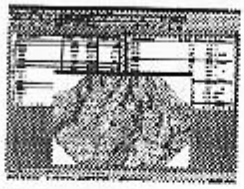
Project Structure



Study Components

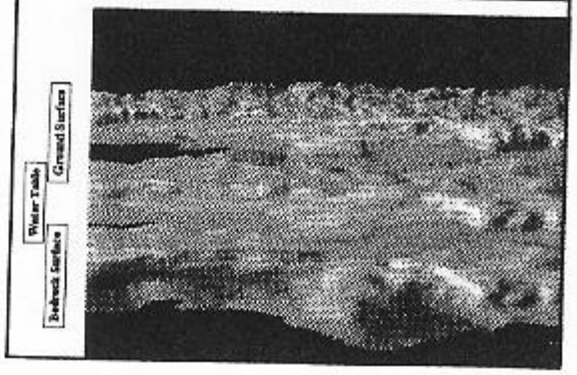
- Creation of Comprehensive Databases
- Aquifer Characterization and Mapping
- Contaminant Sources Inventory
- Groundwater Use Assessment
- Delineation of Municipal Wellhead Protection Areas
- Development of Groundwater Management Action Plan

Groundwater Resources Assessment



Data Collection, Verification, Ground Truthing and Analysis using GIS Techniques

Hydrogeological Mapping and Characterization of Aquifers and Vulnerability Assessment

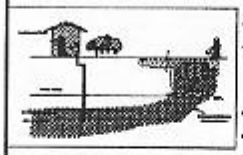


Groundwater Modelling

Municipal Well Capture Zones Analysis and Delineation of Wellhead Protection Areas

3D Rendering of Groundwater Flow and Well Capture Zones

Contaminant Sources Inventory

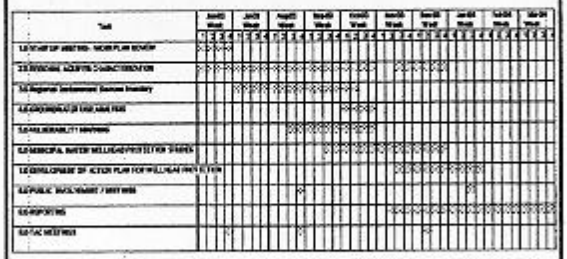


- Contaminated Sites
- Petroleum Hydrocarbon and Chemical Storage and Handling Facilities
- Manufacturing Industries
- Wood Processing Areas
- Waste Disposal Areas and Transfer Stations
- Sewage / Sludge Disposal Areas
- PCB Use and Storage Areas
- Cemeteries etc.

Groundwater Management Strategies

- Review of Regulatory Framework
- Review of some WHPA Protection Plans
- Regulatory Measures
- Non Regulatory and Voluntary Actions
- Public Education and Awareness Programs
- Monitoring Program

Revised Schedule



Project Deliverables

- Aquifer Mapping and Characterization
- Development of Conceptual Hydrogeological Model
- Groundwater Vulnerability Mapping
- Contaminant Sources Inventory
- Groundwater Use Assessment
- Municipal Well Capture Zones and Land Use Risk Rating
- Groundwater Source Protection Action Plan

Thank You for your patience and interest in this Study

We look forward to working with you in this important task of assessing the resources and in developing appropriate management plan for the source protection

Meeting Agenda

The Lakehead Region Area Conservation Authority
Thunder Bay Area Groundwater Management Study
Technical Advisory Committee Meeting No. 2

Date: **December 3, 2003; 2:30 pm to 4:00 pm**
Venue: Lakehead Region Conservation Authority office,
130 Conservation Road
Thunder Bay

1. **Welcome and Opening Remarks**

2. **Project Status**
   - A) Study Components in Progress
   - B) Data Collection and Overview
   - C) Preliminary Hydrogeological Mapping
   - D) Rosslyn Well Modeling
   - E) Project Deliverables

3. **Other Business**
   - A) Project Schedule
   - B) December 3 Public Open house
   - C) Community Involvement
   - D) Next TAC Meeting
   - E) Other

BURNSIDE

Date | File No. | Name: TAC MEETING – DEC 3/03

Project: LACAC offices

ATTENDEE	CONTACT INFORMATION (ph. & email)
Gary Williams	PT Burnside 519-823-4995 gwilliams@pt-burnside.com
Ed Chambers	ph. (807) 857-2265
HENRY JANTUMEN	GILLES.
Lucy Kloosterhuis	OLIVER PAIPOONGE 807-473-5658 TEL 807-577-7829 FAX [redacted] mayor@oliverpaipoonge.on.ca
MONICA ANTHONY	AMEC 344-7218 monica.anthony@amec.com.
LEEANN NYGARD	O'CONNOR TWP. lnygard@oconnortowns.ca
Craig Hockenhove	MNR 475-1134
Kerri Marshall	City of Thunder Bay-Engineering 625-2444
Alisdair Brown	MOE brownal@ene.on.gov.ca 475-1218
Ellen Cramm	Ministry of Municipal Affairs 473-3025 ellen.cramm@mah.gov.on.ca
Victoria Kosny	Lakehead Rural Planning Board (807) 935-3300 lrpb@thaytel.net
Leslie McEachern	City of Thunder Bay - Planning 6052947 lmceachern@city.thunderbay.on.ca
PETER RIDER	AMEC Earth & Environmental Ltd. 905-568-2929 ext.

Attendees

Bill Bartley	LRCA / Stakeholder (807) 344-4729 bbartleg@tbaytel.net
Mervi Heathorne	LRCA.
Abby Mackie	Thunder Bay District Health Unit (807) 625-5933 abby.mackie@tbdhu.com

Thunder Bay Area Groundwater Management and Protection Plan Study

PUBLIC OPEN HOUSE # 1

Wednesday December 3, 2003 4:30 to 8:00 p.m.

Lakehead Region Conservation Authority Offices

130 Conservation Rd., Thunder Bay

Name	Agency/Address	Phone #	Email	Signature
E. CHAMBERS	LRCA / RR1 DORION, ON P0T 1K0	(807) 857-2265		[signature]
LENNY JANTUNEN	RR#1 MAHABEEN	475-4618	JANTUNEN @TBAYTEL.NET	[signature]
Bill BARTLEY	LRCA / SHUNIAH	344-4729	BBARTLEY@ TBAYTEL.NET	[signature]
Eugene Perozzo	RR#2	577-0152		[signature]
Linda Dalmorer	RR#1 Dorion	857-1291	Beatty@ nwconx.net	[signature]
Tanya Kampherm	EcoSuperior	624-2140	tanya@ecosuperior.com	[signature]
Bob Dale	MUNICIPALITY OF NEEBING RR7 T.By P7C5V5	964-2920	Gbdaleview@aol.com	[signature]
Mike McCooeye	Municipality of Neebing 8-8 RR#13 P7C4V2	475-5665	mmccooeye@tbaytel.net	[signature]
Alun Dale	RR#7 (CLOUD BAY) Th.Bay shoreline stewardship assoc.	964-2920	Gbdaleview@aol.com	[signature]
Kari Jamsa (KARI JAMSA)	R.R.16 SITE 2-39 T.B	768/041	OLDSKOOL_Parrot@Hotmail.com	[signature]
D. J. Dowhos	126 CHERCOVER DR	767-3290		[signature]
Rob Cutbush	RR16 Site 3 Comp 33	345 8950		[signature]
Katriina Kirvesniemi	—	—		[signature]
Rick [illegible]	1020 DOGWOOD DRIVE			[signature]
Ron & Catherine Doyon	R.R.3 BLAKE TWP.	475-9744		[signature]

Thunder Bay Area Groundwater Management and Protection Plan Study

PUBLIC OPEN HOUSE # 1

Wednesday December 3, 2003 4:30 to 8:00 p.m.

Lakehead Region Conservation Authority Offices

130 Conservation Rd., Thunder Bay

	Name	Agency/Address	Phone #	Email	Signature
	Colin Havi	DFO			
	Jody Willis	"			
	Neville Ward	DFO	345-8251	ward n@dfo-mpo.gc.ca	
	Doug STEELE	UMA Engineering Ltd.	345-9099	dsteele@UMAGROUP.com	
	Ross Chuchman	City of Th. Bay	684-3537	rchuchman@city.thunderbay.on.ca	
	Arlene Wiseman	101 Hemlock Pl	577-1831		
	Morley Wiseman	" " "	"		

Thunder Bay Area Groundwater Management and Protection Plan Study

PUBLIC OPEN HOUSE # 1

Wednesday December 3, 2003 4:30 to 8:00 p.m.

Lakehead Region Conservation Authority Offices

130 Conservation Rd., Thunder Bay

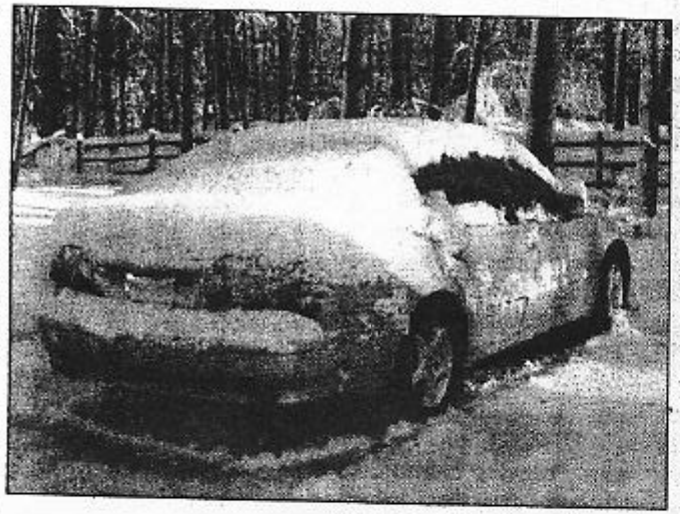
	Name	Agency/Address	Phone #	Email	Signature
	RICHARD CLARK	ENVIROTEST LABS 1081 BARTON ST THUNDER BAY ON P7B 5N3.			

Snow puts buyers in Christmas mood

Continued from page A 1

in the buying mood as the holidays get closer and he expects his store and others around the city to get busier a little earlier than in the past few Christmas seasons.

"This does help us with Christmas traffic, and puts people in a Christmas frame of mind," he said.



Scollie said it was not hard to judge his feelings on the matter. One look at him was all it took to see the elation mounting with each snowflake that hit the ground.

"You wouldn't believe the smile from ear to ear I had on my face going out and shoveling a little bit and also going out to work for Sunday afternoon shopping."

Scollie said he noticed a difference in the number of customers walking through his door the first two times it snowed this fall, adding that Sunday's weather caught the attention of consumers throughout the region.

"You can see the enthusiasm and the anticipation of a good season. Yes, it makes a very very measurable and Sunday to convince people the traditional Northwestern Ontario winter is back for good.

"We're happy to see it but we need a lot more," said Vibert, who runs Rosslyn Services Ltd., specialists in snowmobiles and outdoor winter wear. Vibert said there still isn't enough snow for people to use their snowmobiles, and with recent history on their minds, most consumers are still a little hesitant about spending a lot of money on seasonal equipment.

"To spend $10,000 on something you can't use, a lot of people aren't going to make that investment," he said, adding he is hopeful that by mid-December enough snow will have fallen to convince buyers it will last throughout the winter.

According to Environment Canada the early snowfall may be an anomaly. Below average precipitation levels are forecasted for the next three months, though in the short term the news is good. The government forecaster has predicted a 60 per cent chance of flurries for

NORTHWEST CALENDAR

Dec 3103 C-Journal

TODAY

WEDNESDAY, DEC. 3

LU PROGRAM INFORMATION DAY — Lakehead University will hold program information day today, 10 a.m. to 2:15 p.m. for all Grade 12 students. Interactive fair in CJ Saunders Fieldhouse, 10-11 a.m. and individual program information sessions throughout campus, noon to 1:45 p.m. Information: 343-8500.

FREE FAIR START SCREENINGS — A free Fair Start screening will be held today, 10 a.m. to noon at Mary J.L. Black Library (no appointment necessary). Call 625-8819 or visit www.fairstart.ca. Fair Start screens your child's motor, hearing, speech and language skills as well as their behaviour and general development. For children 18 months to school age.

GROUNDWATER STUDY — Lakehead Conservation and its member municipalities is undertaking a groundwater study. A public open house will be held today at the Lakehead Conservation office on Conservation Road, 4:30-8:30 p.m. Information: 344-5857.

Notice of Public Open House
Thunder Bay Area Regional Aquifer Characteritzation, Groundwater Management and Protection Plan Study

The Lakehead Region Conservation Authority, in conjunction with their member municipalities and other organizations, are undertaking a regional aquifer characterization study.

- evaluate groundwater quality
- evaluate groundwater use
- assess the available groundwater resources
- develop a groundwater model for the Rosslyn well
- complete an inventory and assessment of potential sources of contamination
- assist in developing appropriate groundwater resource management strategies

A Public Open-House will be held to provide background information for the project and present preliminary groundwater mapping and other relevant information related to this groundwater study. The Open-House will be held on:

amec BURNSIDE

Wednesday December 3, 2003 4:30 to 8:00 p.m.
Lakehead Region Conservation Authority Offices
130 Conservation Road, Thunder Bay

Comments received will be incorporated into the study and assessments as appropriate. Another Public Open House will be held in due course to present draft results, and receive additional public input, prior to finalization of the study.

For further information, please contact:

Mr. Bill Bartley, Chairman
Lakehead Regional Conservation Authority
130 Conservation Road
Thunder Bay, Ontario
P7B 6T8
Tel: (807) 344-5857

Mr. Gary Williams, M.Sc. P.Geo.
Project Manager, Hydrogeologist
R.J. Burnside and Associates Ltd.
292 Speedvale Ave., Unit 7
Guelph, Ontario
N1H 1C4

Dec 1103

Groundwater study to aid planners

Dec 1103

BY BRYAN MEADOWS
NORTHWEST BUREAU

H67B-9-1

A new study looking into Thunder Bay-area groundwater is expected to help rural municipalities better plan development when considering water resources.

The lead agency in the study, Lakehead Region Conservation Authority (LRCA), is excited about the significance of the project.

LRCA chairman Bill Bartley said the study is assessing the groundwater resources (aquifers) in a huge area surrounding Thunder Bay.

He said the study was requested by the Ministry of the Environment and should provide "an inventory in a broad sense" of groundwater in the area, including such things as water table levels, groundwater flow, contaminant sources and watershed elements.

The research will cover the area stretching from Dog Lake, south to the Canada-U.S. border, and east to Ouimet Canyon.

He said the study's findings are expected to aid municipal planners by providing an inventory of groundwater and water resources so that officials can better plan green spaces and developments such as subdivisions and industrial parks — so as not to impact water resources.

The first of two information meetings on the regional groundwater study is planned for Wednesday at the LRCA centre, 4:30-8 p.m.

TOP STORIES

Groundwater study to aid planners

By Bryan Meadows - The Chronicle-Journal

December 01, 2003

A new study looking into Thunder Bay-area groundwater is expected to help rural municipalities better plan development when considering water resources.

The lead agency in the study, Lakehead Region Conservation Authority (LRCA), is excited about the significance of the project.

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Search News Archive

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REGIONAL AQUIFER CHARACTERIZATION STUDY

A project of the
LAKEHEAD REGION CONSERVATION AUTHORITY

Groundwater is utilized by numerous rural residents and some industrial and commercial establishments as their primary source of potable water. Recent heightened awareness of the importance of safe drinking water has emphasized the necessity for regional groundwater and aquifer characterization, groundwater management and protection planning.

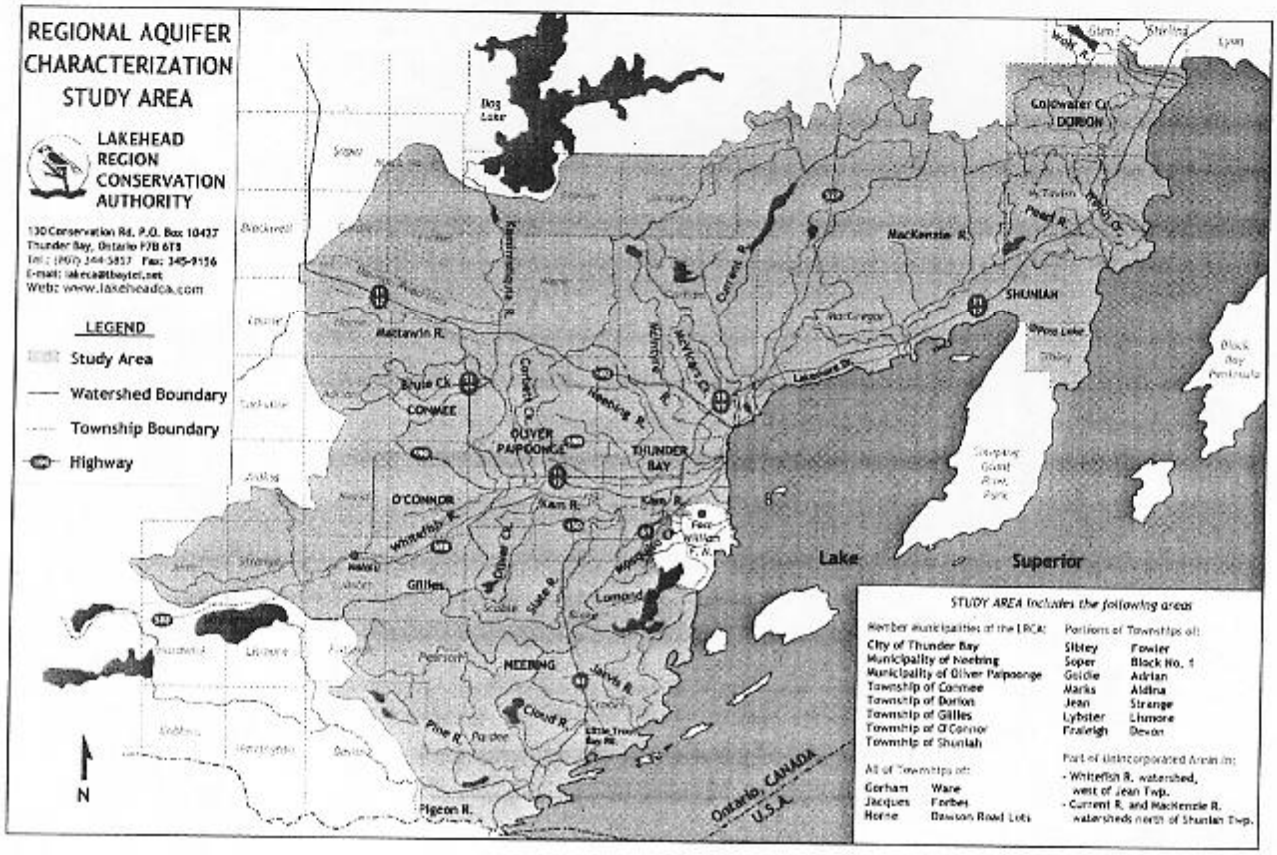
The consulting firm of RJ Burnside & Associates are undertaking the Study using their experience in hydrogeology. The Study will examine the jurisdiction of the LRCA as well as outlying areas.

The Study will map out the extent of aquifers, recharge/discharge areas and possible interactions with surface water. It will also reveal areas that are sensitive to groundwater contamination. Known well records will form part of the report.

Incorporating wise groundwater management principles by the responsible authorities will help protect this precious resource.

For information or to comment, contact:

Bindu Uppaluri, Manager/Senior Hydrogeologist
RJ Burnside & Associates
292 Speedvale Ave. W., Unit 7 Guelph, ON N1H 1C4
(519)823-4995 buppaluri@rjburnside.com

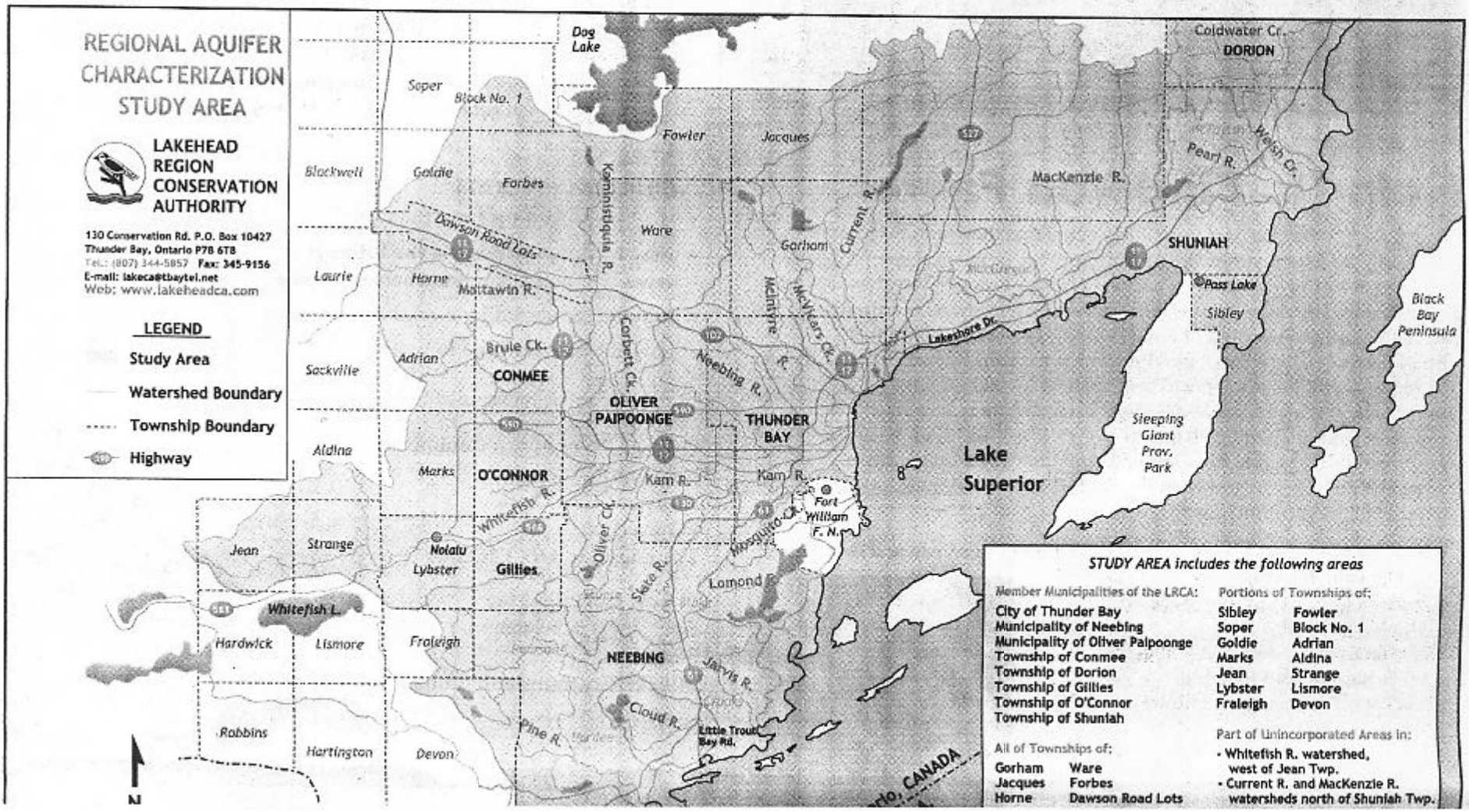


Regional Study will Help Protect Ground Water Quality

Groundwater is a reliable source of drinking water for thousands of residents in the City's rural areas and also services industrial, commercial and institutional uses outside the urban area limit. Recognizing the importance of local and regional groundwater conditions and functions, the City of Thunder Bay, together with surrounding municipalities and townships, and the Lakehead Region Conservation Authority, is participating in a Regional Aquifer Characterization Study. The Study will map out the extent of aquifers, recharge/discharge areas and possible interactions with surface water. It will also reveal areas that are sensitive to groundwater contamination. The information gathered during this Study will allow authorities to make informed planning and development decisions in an effort to ensure that groundwater supplies provide safe drinking water for all well owners.

For information or to comment, contact:

Bindu Uppaluri,
Manger/Senior Hydrogeologist
RJ Burnside & Associates
292 Speedvale Ave. W., Unit 7
Guelph, ON N1H 1C4
(519)823-4995
buppaluri@rjburnside.com



Thunder Bay Area Groundwater Management and Protection Plan Study
PUBLIC OPEN HOUSE # 1 - Wednesday December 3, 2003 4:30 to 8:00 p.m.

PUBLIC INPUT COMMENTS

Name:	Agency or Address:
TOLMONEN LINDA	DORION TOWNSHIP

Comments:

WOULD APPRECIATE "
GROUNDWATER ?"

RECEIVED
DEC 05 2003

AMEC Earth & Environmental Limited
160 Traders Blvd. East, Suite 110
Mississauga, Ontario
Canada L4Z 3K7
Tel: +1 (905) 568-2929
Fax: +1 (905) 568-1686

TRANSMITTAL

To: Linda Tolmonen
c/o Township of Dorion
Dorion Loop Road RR #1
Dorion, ON
P0T 1K0

From: Peter Rider
Date: December 5, 2003
Our Project No.: TC 035044
Your File No.:

Project: Thunder Bay Area Groundwater Management and Protection Plan Study

We are sending the following:

Quantity	Title
1	Bulletin #1 What is Groundwater?
	for your information
	for your approval and return
X	as requested

Remarks:

Thunder Bay Area Groundwater Management and Protection Plan Study

PUBLIC OPEN HOUSE # 1 - Wednesday December 3, 2003 4:30 to 8:00 p.m.

PUBLIC INPUT COMMENTS Gbdaleview@ [illegible]

Name: GLEN Dale	Agency or Address: Shoreline Stewardship Assoc RR # 7 (4-16) Thunder Bay ONT. P7C 5V5

RECEIVED DEC 0 5 2003

Comments:

Request:

(1) Bulletin #1 What is GROUNDWATER?

(2) Municipal Groundwater Studies Summary Study Req'ments 2001/2002

(3) Spill Containment for Farm Fuel Storage.

Thanks in advance.

AMEC Earth & Environmental Limited
160 Traders Blvd. East, Suite 110
Mississauga, Ontario
Canada L4Z 3K7
Tel: +1 (905) 568-2929
Fax: +1 (905) 568-1686

TRANSMITTAL

To: Mr. Glen Dale
Shoreline Stewardship Association
RR #7 (4-16) Thunder Bay, ON
P7C 5V5

From: Peter Rider
Date: December 5, 2003
Our Project No.: TC 035044
Your File No.:

Project: **Thunder Bay Area Groundwater Management and Protection Plan Study**

We are sending the following:

Quantity	Title
1	Bulletin #1 What is Groundwater?
1	Municipal Groundwater Studies Summary of Study Requirements Aug. 2001
1	Spill Containment for Farm Fuel Storages
	for your information
	for your approval and return
X	as requested

Remarks:

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Plan Study

The Lakehead Region Conservation Authority, in conjunction with their member municipalities and other organizations, are completing a regional aquifer characterization study to:

- Assess the available groundwater resources,
- Evaluate groundwater quality,
- Complete an inventory and assessment of potential sources of contamination,
- Evaluate groundwater use,
- Develop a groundwater model for the Rosslyn well, and
- Assist in developing appropriate groundwater resource management strategies.

A Public Open-House will be held to present the draft results for the project and present groundwater mapping and other relevant information related to this groundwater study. The Open-House will be held on:

Thursday May 26, 2005
3:30 to 7:30 p.m.
Lakehead Region Conservation Authority offices
130 Conservation Road, Thunder Bay

The report represents a baseline of groundwater conditions in the study area. Comments received will be incorporated into the study and assessments as appropriate.
For further information, please contact:

Mr. Bill Bartley
Chairman
Lakehead Region Conservation Authority
130 Conservation Road
Thunder Bay, Ontario
P7B 6T8
Tel: (807) 344-5857

Mr. Peter G. Rider, B.Sc. P.Geo.
Senior Hydrogeologist
R.J. Burnside and Associates Ltd.
292 Speedvale Ave., Unit 7
Guelph, Ontario
N1H 1C4
Tel: (519) 823-4995

amec

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Notice of Public Open House
Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Plan Study

The Lakehead Region Conservation Authority, in conjunction with their member municipalities and other organizations, are completing a regional aquifer characterization study to:

- Assess the available groundwater resources,
- Evaluate groundwater quality,
- Complete an inventory and assessment of potential sources of contamination,
- Evaluate groundwater use,
- Develop a groundwater model for the Rosslyn well, and
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For further information, please contact:

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130 Conservation Road
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Tel: (807) 344-5857

Mr. Peter G. Rider, B.Sc. P.Geo.
Senior Hydrogeologist
R.J. Burnside and Associates Ltd.
292 Speedvale Ave., Unit 7
Guelph, Ontario
N1H 1C4
Tel: (519) 823-4995

Meeting Agenda

The Lakehead Region Conservation Authority
Thunder Bay Area Groundwater Management Study

Technical Advisory Committee Meeting No. 2

Date: March 24, 2005; 1:30pm to 3pm
Location: Lakehead Region Conservation Authority Offices
130 Conservation Road
Thunder Bay

1. Welcome/Introductions

2. Review of Project and Update on Progress to date (PowerPoint presentation)

3. Discussion on Draft Report
   - TAC member comments
   - Community Involvement (Open House)

4. Schedule of Remaining Tasks

5. Other Business

6. Next Meeting

Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study

Technical Advisory Committee Meeting

March 24, 2005

Attendance Sheet

NAME	ORGANIZATION
Lucy Kloosterhuis	Mun Oliver Paipoonge
Gwen Garbutt	O'Connor Twp.
Bill Bartley	SHUMIAH / LRCA
Lauri Pajamaki	Conmee / LRCA
ARTHUR MCKAY	CITY OF THUNDER BAY ENGINEERING
ED CHAMBERS	DORION / LRCA.
HENRY JANTUNEN	GILLES TWP.
BEV DALE	NEEBING MUNICIPALITY
Leslie McEachern	City of Thunder Bay - Planning
Ellen Crann	Ministry of Municipal Affairs & Housing
Rudy Buitenhuis	Min of Ag & Food.
Alisdair Brown	MOE
Erich Blackburn	TBDHU.
[illegible]	LRCA

MEMO

To	**TAC Committee members**	**AMEC File #**	TC035044
From	Peter Rider / Monica M. Anthony	**RJB File #**	HA 03 4966
Date	March 31, 2005	cc	

Subject **Lakehead Region Conservation Authority – Thunder Bay Area Aquifer Characterization, Groundwater Management and Protection Study**

Summary of Key Discussion Items
TAC Meeting held on March 24, 2005 at 1:30 pm - 3:00 pm in LRCA offices

Attendees:

Mervi Henttonen	Lakehead Region Conservation Authority (LRCA)	Peter Heinz*	Ministry of Northern Development and Mines (* via teleconference)
Steve Suke	Lakehead Region Conservation Authority (LRCA)	Ellen Cramm	Ministry of Municipal Affairs & Housing
Peter Rider	R. J. Burnside & Associates Limited (Burnside)	Ed Chambers	Dorion / LRCA
Monica Anthony	AMEC Americas Limited (AMEC)	Henry Jantunen	Gilles Twp./LRCA
Bill Bartley	Shuniah / LRCA	Bev Dale	Neebing Municipality/LRCA
Lucy Kloosterhuis	Municipality Oliver Papoonge	Rudy Buitenhaus	Ministry of Agriculture & Food
Gwen Garbutt	O'Conner Twp	Alisdair Brown	Ministry of the Environment
Lauri Pajamaki	Conmee Twp / LRCA	Etrick Blackburn	Thunder Bay District Health Unit
Arthur McKay	City of Thunder Bay-Engineering	Leslie McEachern	City of Thunder Bay- Planning

Items	Action
Meeting Opening by Chairman Bill Bartley with welcome to attendees and a round of introductions **Meeting Agenda** outlined to the TAC Committee members. **Power Point Presentation** provided by Burnside/AMEC covering the following topics: Project Background Study Objectives Study Components Groundwater Resources Assessment Groundwater Modelling Contaminant Source Inventory Groundwater Management Strategies Community Involvement Project Deliverables Work Completed To Date	

R J Burnside & Associates Limited
292 Speedvale Ave., Unit 7
Guelph, Ontario N1H 1C4
Tel (519) 823-4995
Fax (519) 836-5477
www.rjburnside.com

AMEC Americas Limited
Earth & Environmental Division
95 North Cumberland Street
Thunder Bay, Ontario P7A 4M1
Tel (807) 346-7032
Fax (807) 344-6211 www.amec.com

Items	Action
Discussions:	
1 **Data Accuracy** How current is the available data. It was noted in the presentation that the record of new, drilled well development ceases in the year 2000.	**Consultants** • Research the recentness of existing data • Add population data to figure of new, drilled well development • include in Exec. Summary: 1. Note that due to the limitations in the data this report is a snapshot and a "living document" subject to updates and improvements as new data becomes available.
2 **Data Gaps** TAC members were in general agreement that data gaps exist. A discussion ensued that the project objective was to gather data from a number of sources and compile the information in one location, i.e., the Study Report. Some data gaps are unavoidable (e.g., at one point in time according to Alisdair Brown, there was no requirement to report dug wells to MOE) and will be rectified as practically possible with the assistance of the TAC members. Future studies will build upon this Study to reduce gaps even further. Examples: • Missing some landfill locations and missing MNR landfills expected to be included in the supplied data (e.g., Gillies Twp.) • Number of recorded wells vs. actual number of wells in study area • Base map is missing provincial highways • Some village and town names are outdated • Refinements are required on the land use maps (e.g., Conmee) • Inclusion of the proposed Provincial Water Quality Monitoring Well Locations would be useful • The protected area upgradient of the Rosslyn Wellfield is not noted on the map. • LRCA Molkaski Property to be delineated and Oliver Paipoonge Property in area.	**TAC**: • TAC member's written comments are to be forwarded to LRCA on or before April 7, 2005. To date, MOE and LRCA are the only commenting TAC members. Consultants require electronic format (e.g. MS Word) • Conmee rep. Provided comments at end of meeting. **Consultants** • Edit report and maps based on TAC member comments. • All TAC member comments will be collated and included in an appendix in the final report. The appendix will include a column indicating what action has been taken regarding the comments submitted. • Provide a text and figures comment template to the LRCA for distribution. • include in Exec. Summary: 1. This study is a first step and compendium of available data. Future studies will build upon this report to close the gaps. **LRCA** • Distribute comment template to all TAC members for uniform formatting and ease of input/editing.

	Items	Action
3	**TAC Member Logos** • A short discussion on the application of all member logos on the Study Report cover.	• Agreed to include MOE & LRCA logos as all member groups are implied within the LRCA logo. **Consultant** Study Report stipulates within the body of the report each member group
4	**Stewardship** The question of who is to take stewardship of this "living" document. The MOE representative stated this item is yet to be determined.	**TAC** • Determine what entity is to take stewardship of this document.
5	**Land Use Map** A concern was expressed that Figure 11.1 identifies the area as high risk. LRCA noted that the thin overburden covering the bedrock leads to this result. Mitigation of risk may be required for proposed development, activities etc.	**Consultant** • Address in report the reason for the rating.
6	**Suggestions** The term "best practices" may be translated to "beneficial practices".	
7	**Report's Conclusions** Conclusions appear to be too finite based on data limitations.	**Consultant** • To review.
8	**Report's Recommendations** It was suggested more recommendations are required.	**Consultant** • To review.
9	**Final Report** A discussion took place regarding how the final report will be delivered. It was discussed that Draft Reports will be collected to ensure no copy ends-up in circulation.	**Consultant** • Draft reports to be returned to consultant prior to receipt of Final Report.
	New Business **Public Information Centre (PIC) Meeting**	• May 4, 2005 at LRCA's offices proposed. The format will be similar to the last PIC (from 2:30-8:00 pm at Authority offices. Display materials to be left to facilitate follow-up for people who did not attend session.

Items	Action

Meeting Adjournment

- Consultants thanked attendees for their input.
- Chair Bill Bartley adjourned the meeting at 3 p.m. March 24, 2005

Please report any errors or omissions to Peter Rider as soon as possible.

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amec

Attendees

The Lakehead Region Conservation Authority
Thunder Bay Area Groundwater Management Study

Open House
Date: May 26, 2005; 3:30pm to 7:30pm

	Name	Organization	Email address	Phone Number
1	Gary Murhegan	Pabato		767-2560
2	Ronan Rutledge	ENVIROTEST TBA	tba@envirotest.com	
3	[illegible]	Municipal Affairs & Housing		
4	Lucy Kloosterhuis	MUN OLIVER PAIPOONGE		473-5658
5	BILL BARTLET	TOWNSHIP OF SHUNIAH & LRCA		
6	R. [illegible]	Ag & Food		
7	David Hearn.	Mun of Oliver Paipoonge		939 1540
8	T. [illegible]	Municipality of Neebing		964-2920
9	[illegible]			
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

COMMENT SHEET

'REGIONAL AQUIFER STUDY' OPEN HOUSE
MAY 26TH, 2005

Please outline your views about the aquifer study.

Seems very comprehensive although some of the well data appears to be dated.

I hope surface wells will be considered in the heavily populated rural areas.

Name: David Hearn Phone #: 939 1540

Address: RR2 Site 12 - 49 Thunder Bay, ON P7C 4V1

Lakehead Region Conservation Authority
P.O. Box 10427 130 Conservation Road
Thunder Bay, ON P7B 6T8
Tel. 344-5857 Web: www.lakeheadca.com
Fax 345-9156 E-mail: lakeca@tbaytel.net

COMMENT SHEET

'REGIONAL AQUIFER STUDY' OPEN HOUSE
MAY 26TH, 2005

Please outline your views about the aquifer study.

THE STUDY AREA SHOULD BE EXPANDED TO INCLUDE THE ENTIRE WATERSHED AREA, WITH APPROPRIATE MUNICIPAL AND INDUSTRY FUNDING

Name: Gary M Phone #: 767-2560

Address:

Lakehead Region Conservation Authority
P.O. Box 10427 130 Conservation Road
Thunder Bay, ON P7B 6T8
Tel. 344-5857 Web: www.lakeheadca.com
Fax 345-9156 E-mail: lakeca@tbaytel.net

COMMENT SHEET

'REGIONAL AQUIFER STUDY' OPEN HOUSE
MAY 26^{TH}, 2005

Please outline your views about the aquifer study.

NOT POPULATION CENTERS

- [illegible] Conmee
- Millar O'Connor
- Boyd Mokomon
- Slate River Valley Finmark
- Silver Mountain

- Hymers North of 588 + 595 should be added 500 series Highways Provincial Secondary Roads

- PARDEE TOWNSHIP

Name: ______________________ Phone #: ______________

Address: ______________________________________

Lakehead Region Conservation Authority
P.O. Box 10427 130 Conservation Road
Thunder Bay, ON P7B 6T8
Tel. 344-5857 Web: www.lakeheadca.com
Fax 345-9156 E-mail: lakeca@tbaytel.net

BURNSIDE

Appendix D
Municipal Well Records

H2   52A6

The Ontario Water Resources Commission Act

WATER WELL RECORD

6101091 · 57141 · RAM N · 01

11

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

County or District	Township, Borough, City, Town, Village	Con., Block, Tract, Survey, etc.	Lot
Thunder Bay	Roslyn	Plan 769 Lot 12	

Owner (surname first)	Address	Date completed
Harju - L -	315 Black Bay T.B. Ont.	Day 17 Mo. Aug Yr. 73

16	318400	5359500	5	0?rd	6	21

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

General colour	Most common material	Other materials	General description	Depth – feet From	To
		Clay	Loose	0	8
Brown	gravel	Clay silt	med Loose-	8	25
Tan	Clay-	Clay -	Loose - Fine	25	25.2
Gray	Sand	Sand -	med - Hard -	25.2	53
Gray	Clay	Clay	Hard - aggre.	53	75
Gray D.	Clay	gravel. Rocks-	med. Hard	75	82
Gray L.	Clay	Some agg.	Hard.	82	85
Gray	Clay	Boulders.	Light Hard V.	85	93
Gray D	Clay	Hardpan	med Hard-	93	100
Gray D	Clay	Clay aggre	med Hard.	100	114
Gray D	Clay	Clay no aggre.	Soft S	114	116
Gray D.	Silt	Fine - Silt.		116	127
Gray D	Sand	gravel - med to Fine	Loose -		

CODED

31

32

41 WATER RECORD

Water found at – feet	Kind of water
25.2	☒ Fresh
116	☒ Fresh
127	☒ Fresh

51 CASING & OPEN HOLE RECORD

Inside diam. inches	Material	Wall thickness inches	Depth – feet From	To
6	☒ Steel	Std	0	120
5	☒ Steel	Std	118	119

SCREEN

Size of opening (slot no.)	Diameter	Length
020	Tel. 6"	10
Material and type: Plastic (Comp) Inter	Depth to top of screen: 116	

61 PLUGGING & SEALING RECORD

Depth set at – feet From	To	Material and type (cement grout, lead packer, etc.)
118	120	drive shoe -
20	119	Cement puddled
30	119	Clay

71 TEST

Pumping test method: ☒ Pump · Pumping rate: 10 GPM · Duration of pumping: 6 hrs

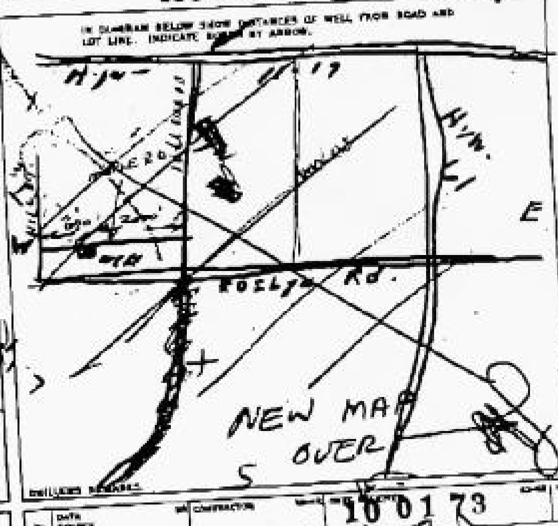
Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
73	78	75	71	71	71

Pump intake set at: 95 feet · ☒ Clear

Recommended pump type: ☐ Shallow ☒ Deep · Recommended pump setting: 110 feet · Recommended pumping rate: 10 GPM

LOCATION OF WELL 1859

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



FINAL STATUS OF WELL	
☒ Water supply	☐ Abandoned, insufficient supply
☐ Observation well	☐ Abandoned, poor quality
☐ Test hole	☐ Unfinished
☐ Recharge well	

WATER USE	
☒ Domestic	☐ Commercial
☐ Stock	☐ Municipal
☐ Irrigation	☐ Public supply
☐ Industrial	☐ Cooling or air conditioning
☐ Other	☐ Not used

METHOD OF DRILLING	
☒ Cable tool	☐ Boring
☐ Rotary (conventional)	☐ Diamond
☐ Rotary (reverse)	☐ Jetting
☐ Rotary (air)	☐ Driving
☐ Air percussion	

Name of well contractor: North Star Well Drlg · Licence number: 1450

Address: 308 Marion St T.B.

Name of driller or borer: Harry Gonsall · Licence number: 1450

Signature of contractor: Gonsall · Submission date: Day 26 Mo. Sept Yr. 73

OFFICE USE ONLY — 100173 · CSS.S8 · P

Post-it™ Fax Note 7671 — Date · # of pages ▸ 2 · To Peter Rider · From Jacob Zaidel · Co./Dept. Burnside · Co. AMEC · Phone # · Phone # · Fax # 1519 836 5477 · Fax #

#3 52A/6 5246

The Ontario Water Resources Commission Act

WATER WELL RECORD

11 6101092 — 6141 KAA N 01

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

County or District	Township, Borough, City, Town, Village	Con., Block, Tract, Survey, etc.	Lot
Thunder Bay	Roslyn Lipooney	RPL 310 plan 164	Conc 1 Lot 12

Owner (Surname First): Harju L. Address: 315 Black Bay T. Bont. Date completed: Day 12 Mo 09 Yr 73

21 | 1/16 | 318300 | 5359650 | 5 | 0720 | 6 | 21

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

General Colour	Most Common Material	Other Materials	General Description	Depth – Feet From	To
			Loose	0	8
Gray	OVBt	Silt	Very Loose	8	22
Tan	Clay	Silt	Loose	22	30
Tan	Clay	Silt	Tight	30	75
Gray	Clay	& aggregate	Tight Hard	75	97
Tan	Clay	Silt	Soft	97	110
Gray	Clay	Silt	Hard R. 115-116	110	118
Gray	Clay	Rocks	Soft Loose	118	122
Black	Clay	Silt (wet)	Med Loose	122	127
Black	Sand (Fine)	gravel (Small)	Tight Fine	127	130
Black	Sand	Silt	Soft mushy	130	136
Gray	Silty	Silt	Hard	136	142
Green	granite	Rock			

31 | 0008225D6173 | 0022 050677 | 0030 0506773 | 0075 20507? | 0097 050673 | 0110 20506685 | 0122 20506685 | 0136 20506685 | 0142 42173

32 | 0118 20512 73 | 0122 805069 | 0123 80811 73 | 0130 8080471 | 0136 20685 | 0142 42173

41 WATER RECORD

Water Found at – Feet	Kind of Water
0121	1 ☒ Fresh

51 CASING & OPEN HOLE RECORD

Inside Diam. Inches	Material	Wall Thickness Inches	Depth – Feet From	To
06	1 ☒ Steel	S10	0	0121
5			109	127

SCREEN

Slot No.: .030 Diameter: 06000 Length: 05

Material and Type: S. Steel. Depth to top of screen: 0121 Feet

61 PLUGGING & SEALING RECORD

Depth Set at – Feet From	To	Material and Type
0	121	Drive shoe. Puddled Clay

71 PUMPING TEST

Pumping test method: 1 ☒ Pump. Pumping rate: 0034 GPM. Duration of pumping: 06 Hours 00 Mins.

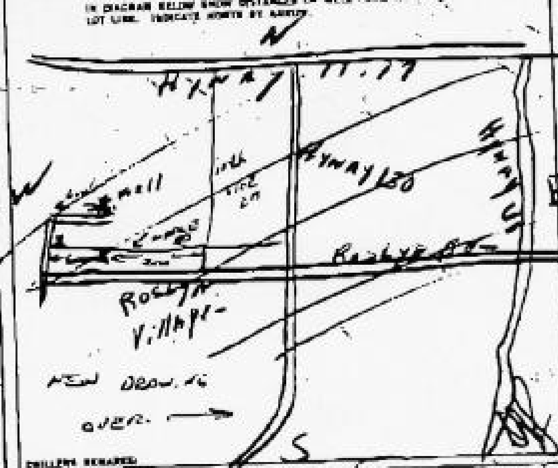
Static level: 073 feet. Water level end of pumping: 110 feet.

Pump intake set at: 100 feet.

Recommended pumping rate: 2.5 GPM

LOCATION OF WELL 1859

In diagram below show distances of well from road and lot line. Indicate north by arrow.



FINAL STATUS OF WELL	1 ☒ Water Supply
WATER USE 01	1 ☒ Domestic
METHOD OF DRILLING 1	1 ☒ Cable Tool

Drillers Remarks:

CONTRACTOR

Name of Well Contractor: North Star Well Drlg. Licence Number: 1450

Address: 308 Marion St. Thunder Bay

Name of Driller or Borer: Jerry Borsall. Licence Number: 1450

Signature of Contractor: Jerry Borsall

OFFICE USE ONLY

Data source: 1 | Contractor: 1450 | Date received: 011073

P B3

WI

OWRC COPY

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Appendix E
Groundwater Modelling Report

GROUNDWATER FLOW MODEL DEVELOPMENT AND WHPA DELINEATION FOR THE ROSSLYN WELL FIELD

1.1 INTRODUCTION

A three-dimensional numerical groundwater flow model was developed to simulate groundwater extraction from the Rosslyn Well Field. This model was developed and calibrated in order to delineate the Well Head Protection Area (WHPA) for Rosslyn Municipal No.1 and No. 2 Wells. Simulation of the individual zones of capture for each municipal well is based on the maximum Ministry of the Environment (MOE) permitted daily rate of 27.5 m^3/d. Details of the model development, calibration and its application for the WHPA delineation are provided below.

1.2 MODELLING SOFTWARE

The Modular Finite-Difference Groundwater Flow Model (MODFLOW) developed by McDonald and Harbaugh (1988) and MODPATH, developed by Polock (1994) for the United States Geological Survey (USGS), were used to simulate groundwater flow and flow paths for this assignment. Both MODFLOW and MODPATH are well accepted by regulatory agencies and widely used for a variety of applications including delineation of capture zones for pumping wells.

A fully integrated pre- and post-processor - Visual MODFLOW (version 2.8), developed by Waterloo Hydrogeologic Software, Inc. (Guiguer and Franz, 1999), was used to assemble the input data and present the MODFLOW and MODPATH simulation results.

1.3 NUMERICAL MODELLING PROCEDURE

The modelling procedure used in this study included the following major steps:

- development of the conceptual model;
- selection and digitization of the modelling domain;
- specification of boundary conditions;
- assignment of the initial input parameter values;
- calibration of the groundwater flow model; and
- simulation of the capture and Time of Travel (TOT) zones created by the groundwater extraction from Rosslyn Well Nos. 1 and 2.

1.4 CONCEPTUAL MODEL

The developed conceptual model was based on the hydrogeological conditions at the site, as characterized through the GUDI Assessment – Rosslyn Well Field report, prepared by Waters Environmental Geosciences Ltd. (March, 2003). The information provided in the Waters report served as a basis for the input parameters for the developed conceptual model. The study area for the groundwater model is presented in Figure 1.

1.4.1 Geologic Settings

Based on the results presented by Waters Environmental Geosciences Ltd. (March, 2003) and an analysis of water well records; the water bearing overburden material at the site is identified as being primarily comprised of surficial sands, till, silty clay, and basal sand and gravel units. The subject wells are reportedly screened in the basal sand and gravel unit.

The basal sand and gravel unit was interpreted to extend over a distance of about 1,200 m to 1,800 m away from the Kaministiquia River in a north-westerly direction. The clay unit, underlying the surficial deposits, was interpreted to extend for a distance of about 2,000 m from the river. Undifferentiated till deposits were interpreted to extend down to the bedrock surface north of the surficial clay zone (Figure 1). Total thickness of the overburden material in the Rosslyn Village area is about 40 m. Bedrock underlying the overburden material is described as sedimentary rock of the Animikie Group. A typical south-north cross-section is shown in Figure 2.

According to the pumping test data analysed by Waters Environmental Geosciences Ltd. (March, 2003) transmissivity of the basal sand and gravel aquifer is expected to be about 66 m^2/d. Based on this transmissivity value and taking into account that the basal unit thickness is about 3 m to 6 m the hydraulic conductivity of the basal unit is expected to be in the order 10^{-2} cm/s.

Apparent transmissivity of the bedrock aquifer was estimated to be in the range of 0.08 m^2/d to 82.3 m^2/d, with a geometric mean of 2.8 m^2/d (Waters Environmental Geosciences Ltd., March, 2003). The average penetration depth of wells in the area into this aquifer is about 37 m. Based on the available information, Apparent Transmissivity values, as determined by Waters from a review of the available water well records, were applied to information on bedrock penetration for shallow bedrock wells in the model area. Based on these data, the hydraulic conductivity of the upper bedrock zone is expected to be in the order of 10^{-3} cm/s. Taking this into account, a range of hydraulic conductivity values between $1X10^{-3}$ cm/s to $4X10^{-4}$ cm/s was applied to the bedrock aquifer for modelling purposes.

1.4.2 Groundwater Flow

The groundwater flow direction in the shallow and deep overburden and bedrock aquifers was interpreted to be primarily south to southeast, towards the Kaministiquia River. Close to the river hydraulic heads in the shallow overburden appear to be higher than in the deep system (basal unit and bedrock aquifer). This can be attributed to the fact that water level in the Kaministiquia River (about 195 m a.s.l.) appears to be below the bottom of the shallow sand unit.

Further north of the river there is no indication of significant differences between hydraulic heads in various aquifer units.

1.4.3 Recharge Zones

Recharge of the aquifer within the study area was assumed to be coming from precipitation only. Note that recharge of the deep aquifer zones is expected to occur primarily in the undifferentiated till zone located in the northern portion of the study area (Murillo area, Figure 1).

1.4.4 Discharge Zones

Groundwater from both overburden and bedrock units is expected to discharge into the Kaministiquia River and into several permanent streams located north of Rosslyn Village.

1.5 MODEL DOMAIN AND NUMERICAL GRID

The model domain for the Rosslyn WHPA study is shown in Figure 3. The model domain boundaries were based on the interpreted groundwater flow contours and directions as indicated by Figures 8 and 9 of the Waters Environmental Geoscience Ltd. (March, 2003) Report and the information gathered from the MOE Water Well database review completed by AMEC and Burnside. The east and west boundaries were placed 2 km and 1 km from Rosslyn Village, respectively. The northern boundary was extended 7 km from the well field to the north, to well past the interpreted recharge area near Murillo (approximately 6 km from the village of Rosslyn). Interpretation of the regional groundwater flow indicates that groundwater is flowing towards Rosslyn from an area hydraulically up gradient of Murillo.

The locations of the east and west boundaries for the model were chosen to parallel interpreted groundwater flow lines perpendicular to the equipotential contours of groundwater elevation. These were assigned as “no flow” boundaries. Due to the low pumping rates permitting for the pumping wells, the well field is not anticipated to cause any interaction with the boundaries. The simulated groundwater flow system shown in Figure 5 demonstrates the validity of this assumption. This is also shown in Figure 6 and 7 that show a very narrow capture zone for the pumping wells.

The model was developed with six layers. The uppermost layer (model layer 1) represents spatial distribution of surficial material shown in Figure 1. Model layer 2 represents a lacustrine clay unit in the southern portion of model domain and undifferentiated till north of Canadian National Railway Road. Model layer 3 represents the till unit within the entire model domain and undifferentiated till north of Canadian National Railway Road. Model layer 4 represents the basal sand and gravel unit in the southern portion of model domain and till further north, in the area where the basal unit pinches out (Figure 3). Model layers 5 and 6 represent the upper 30 m of bedrock. Groundwater flow in bedrock below the 30 m depth zone was neglected and, therefore, the bottom of layer 6 was assumed to be impermeable for flow (i.e., a no flow boundary).

The bedrock surface, created by krigging interpolation of the borehole data was used as a bottom of model layer 4. Bottom elevations of layers 5 and 6 were established at 15 m and 30 m below the overburden/bedrock interface, respectively. The top of layer 4 was established on the basis of its bottom elevation and the interpolated thickness of the basal sand and gravel unit. The top and bottom of layer 2 (bottom of layer 1 and top of layer 3, respectively) were established on the basis of the interpolated upper and lower surfaces of clay unit. The interpreted and interpolated water table surface constituted top of the model layer 1.

The grid for the numerical finite-difference groundwater flow model consisted of about 170,000 active cells. The majority of numerical cells were constructed with horizontal sizes of approximately 30

metres. Finer grid spacing of about 5 m was utilized in the vicinity of the Rosslyn Municipal wells in order to provide a more refined simulation of the groundwater flow system affected by the wells.

1.6 BOUNDARY CONDITIONS

The boundary conditions, specified along the perimeter of modelling domain, account for the interaction between the groundwater flow within the modelled area and the rest of the aquifer. The specification of the boundary conditions was based on the interpreted groundwater flow system.

A no-flow boundary condition was specified along the western and eastern boundaries of the model domain since these boundaries were made parallel to the interpreted regional groundwater flow direction.

A hydraulic head of 195 m.a.s.l. was specified in layers 2 and 3 along the southern boundary of the model domain. This head value represented water level in the Kaministiquia River.

A hydraulic head of 300 m.a.s.l. was specified in the northwestern corner of the model domain. This head value represented observed water levels in documented residential wells in this area.

Permanent streams located within the model domain were simulated using the so-called drain nodes. According to the MODFLOW concept, the discharge to the drain occurs only when heads in the cells adjacent to the drain are higher than the assigned drain (stream) elevation. Leakage from the drain to the aquifer is not allowed by the drain package. Therefore, all simulated streams were assumed to be gaining water from the aquifer.

1.7 INITIAL VALUES OF INPUT PARAMETERS

1.7.1 Hydraulic Conductivities

Hydraulic conductivities initially specified for each stratigraphic unit of the simulated aquifer zone are shown in Table 1.

TABLE 1. INITIAL AND CALIBRATED INPUT PARAMETERS

Subsurface Material	Recharge Rate (mm/year)		Hydraulic Conductivity (cm/s)	
	Initial Values	Calibrated Values	Initial Values	Calibrated Values
Surficial Sand	200	180	$1.0x10^{-3}$	$1.0x10^{-3}$
Silty clay	20	18	$1.0x10^{-6}$	$1.2x10^{-7}$
Till/Peat	100	90	$1.0x10^{-4}$	$2x10^{-4}$ -$5x10^{-4}$
Basal Sand & Gravel	NA*	NA	$1.0x10^{-2}$	$1.0x10^{-2}$
Upper 15 m of Bedrock	NA	NA	$1.0x10^{-3}$	$1.0x10^{-3}$
Lower 15 m of Bedrock	NA	NA	$2.0x10^{-4}$	$2.0x10^{-4}$

* not applicable

Note: Anisotropy, i.e. horizontal to vertical hydraulic conductivity ratio varied from 1 (isotropic medium) for the basal sand and gravel unit to 50 for the bedrock aquifer.

1.7.2 Recharge Rates

Recharge rates of 200 mm/year, 100 mm/year and 20 mm/yr were initially assigned to the surficial sand, till and silty clay areas, respectively (Table 1).

1.8 MODEL CALIBRATION

The calibration of a groundwater flow model refers to a demonstration that the model is capable of reproducing field measured heads and flows - the so-called calibration values (Anderson and Woessner, 1992). Static water levels reported in 45 wells (13 shallow overburden wells, 5 basal aquifer wells and 27 bedrock wells) located within the model domain were selected as the calibration values for the developed groundwater flow model.

Calibration of the model is achieved by adjusting the physical and hydraulic parameters that are associated with highest degree of uncertainty in order to achieve a reasonable match between computed and observed (measured) data. The numerical groundwater flow model was calibrated by varying hydraulic conductivities and recharge rates. Calibrated hydraulic conductivity and recharge rate values are shown in Table 1.

The correlation between computed and observed hydraulic heads in 45 observation wells, obtained at the end of the calibration process, is shown in Figure 4. The results presented in this figure demonstrate a relatively good agreement between computed and observed data: mean, mean absolute and root mean squared errors (discrepancies between computed and observed heads) are 0.3 m, 2.1 m, and 2.7 m, respectively. The ratio of the root mean squared error to the total head loss (or water table relief) in the area of interest is about 2.7%. Therefore, the errors are only a small part of the overall model response (Anderson and Woessner, 1992). Discrepancies between computed and observed heads in the basal aquifer are less than the average: both mean absolute and root mean squared errors for the calibration wells screened in this unit are about 1 m. The simulated groundwater flow system in model layer 4, corresponding to the basal sand and gravel unit and till further upgradient, is shown in Figure 5.

The model-calculated groundwater flow budget for the modelled area is summarized in Table 2.

TABLE 2. GROUNDWATER FLOW BUDGET FOR THE ROSSLYN MODEL DOMAIN

Budget Component	Volumetric Rate (m^3/d)	Percentage of Total Inflow/Outflow Rate**
Inflow		
Recharge	6,344	99%
Constant Head Boundary*	87	1%
Total Inflow	6,431	100%
Outflow		
Kaministiquia River.	3,211	50%
Other Streams	3,220	50%
Total Outflow	6,431	100%
Model Budget Error	0.4	0.01%

*Northwestern corner of model domain; ** Rounded to the nearest integer.

1.9 MUNICIPAL WELL CAPTURE ZONES

The modeling used the pumping rate specified in the MOE Permit to Take Water (PTTW number is 00-P-6073 dated Dec 5, 2000), which allows a maximum of 27,500 litres per day (27.5 m^3/day). The Engineers' report of Waterworks prepared by Wardrop Engineering Inc. (May 2001) indicates that the two wells operate on an alternating basis. As a result, the groundwater extraction simulation was applied to one well at a time.

The domestic wells within the model domain were not entered into the model as active pumping wells, since the pumping rate for domestic wells is normally less than 1 m^3/day and the influence of these wells on the modeling results is considered to be insignificant. However, as discussed above, these wells were used as calibration points for the model.

The calibrated steady-state groundwater flow model, described above was used for delineation of wellhead protection areas. The capture zones associated with 25, 10 and 2-year time-of-travel (TOT) zones, were computed for the permitted pumping rate of 27.5 m^3 per day using the backward-in-time particle tracking procedure of MODPATH (Pollock, 1994). Effective porosity of the overburden material was assumed to be 0.3.

The delineated capture zones for Rosslyn Wells No. 1 and No. 2 are shown in Figures 6 and 7, respectively. Each 25-year TOT zone is estimated to be about 50 m wide and extends over a distance of about 1,500 m to the northwest of the municipal wells. Each 10-year TOT is also approximately 50 m wide and is about 1,300 m long. Each 2-year TOT is approximately 40 m wide and about 300 m long. Note that 50-day TOTs were estimated to be about 25 m wide and 30 m long. This result is consistent with the 15.5 m 50-day capture radius (31 m diameter) predicted by Waters Environmental Geosciences Ltd. (March, 2003).

REFERENCES

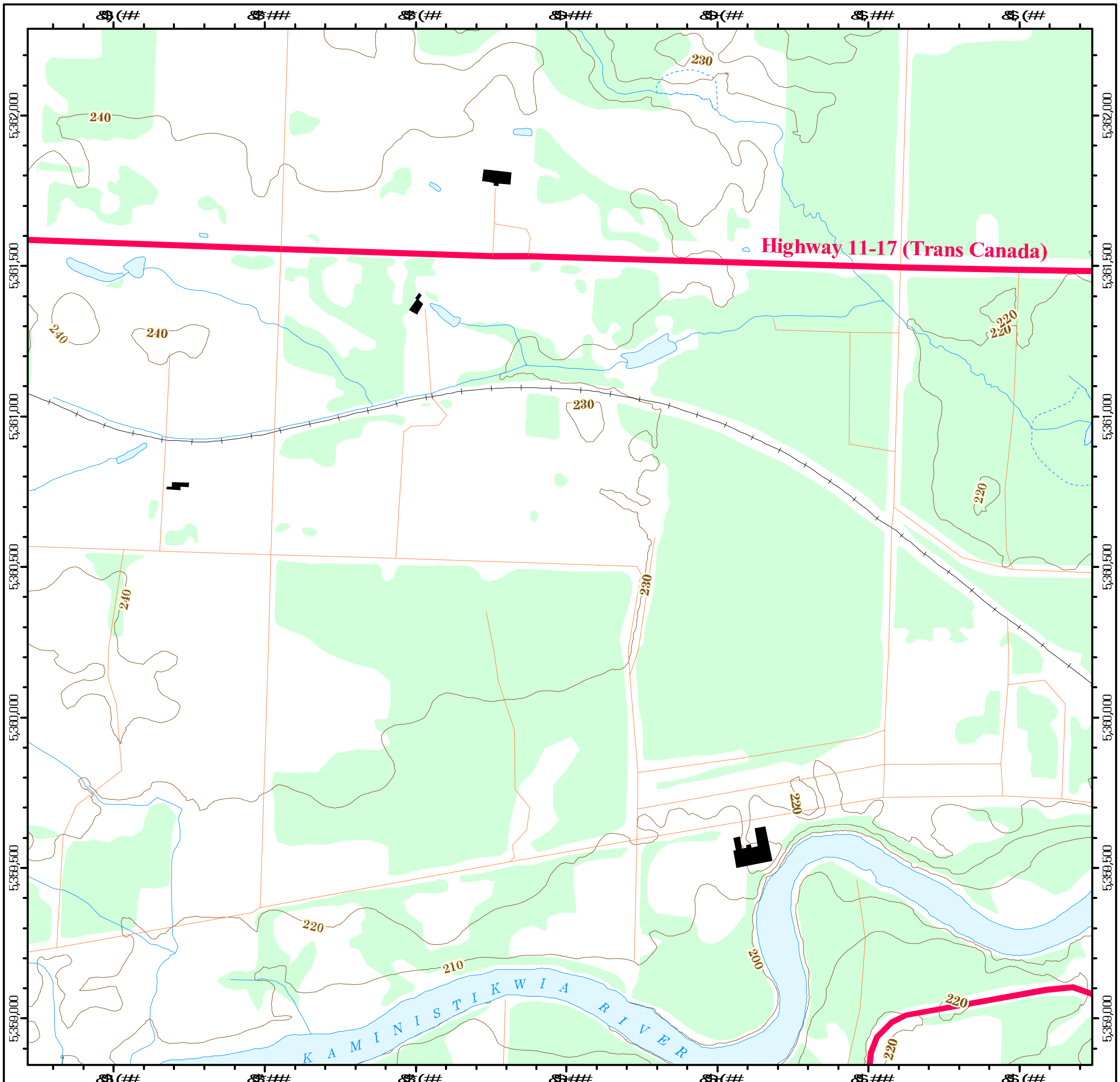
Anderson, M.P., and W.W. Woessner, 1992. *Applied Groundwater Modelling*, Academic Press, Inc, San Diego, CA.

Guiguer, N., and T. Franz, 1999. *User's Manual for Visual MODFLOW*, Waterloo Hydrogeologic, Inc. Waterloo, Ontario.

McDonald, M.G., and A.W. Harbaugh, 1988. *A Modular Three-Dimensional Finite-Difference Groundwater Flow Model*. United States Geological Survey, Reston, Virginia, 22092.

Pollock, D.W., 1994, User's Guide for MODPATH/MODPATH, Version 3: A particle tracking post-processing package for MODFLOW, the U.S. Geological Survey finite-difference ground-water flow model. United States Geological Survey Open-File Report 94-464, Reston, Virginia, 22092.

Waters Environmental Geosciences Ltd. Hydrogeological Investigation and GUDI Assessment. Municipality of Oliver-Paipoonge Well Supply Rosslyn, Ontario, March 2003.


Highway 11-17 (Trans Canada)
K A M I N I S T I K W I A R I V E R
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220
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200
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5,360,500
5,360,000
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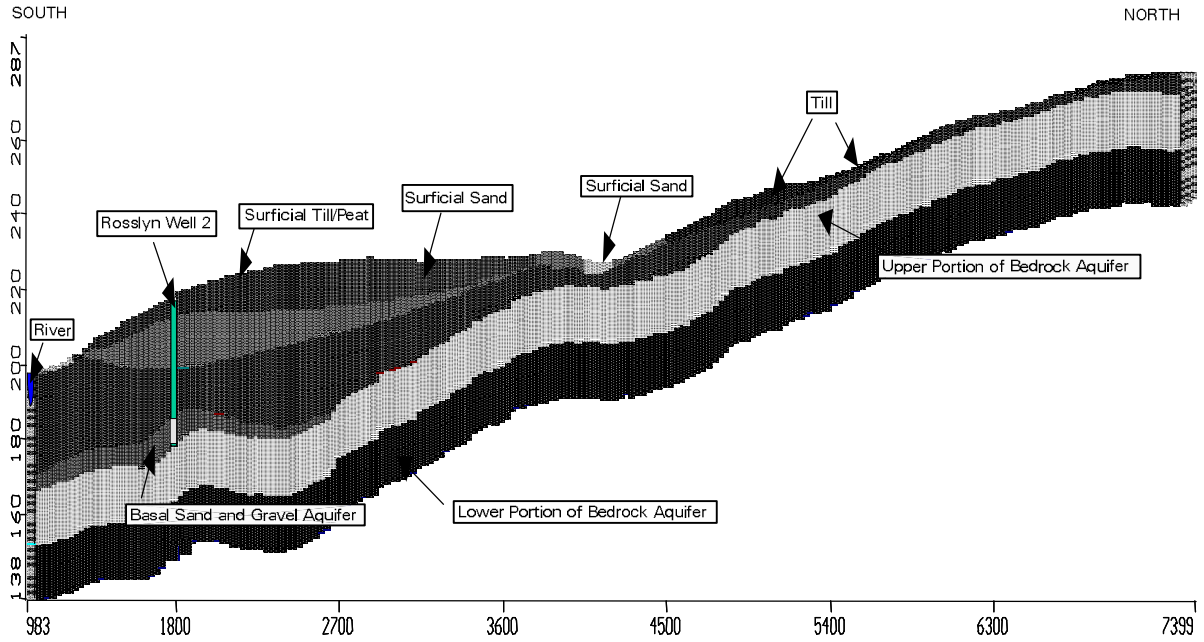
5,359,000



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 2
South-North Cross-Section

This figure is to be read in conjunction with the Thunder Bay Area Regional Groundwater Management and Protection Study.

N.T.S.
July 2005
Project Number: HA 03 4966

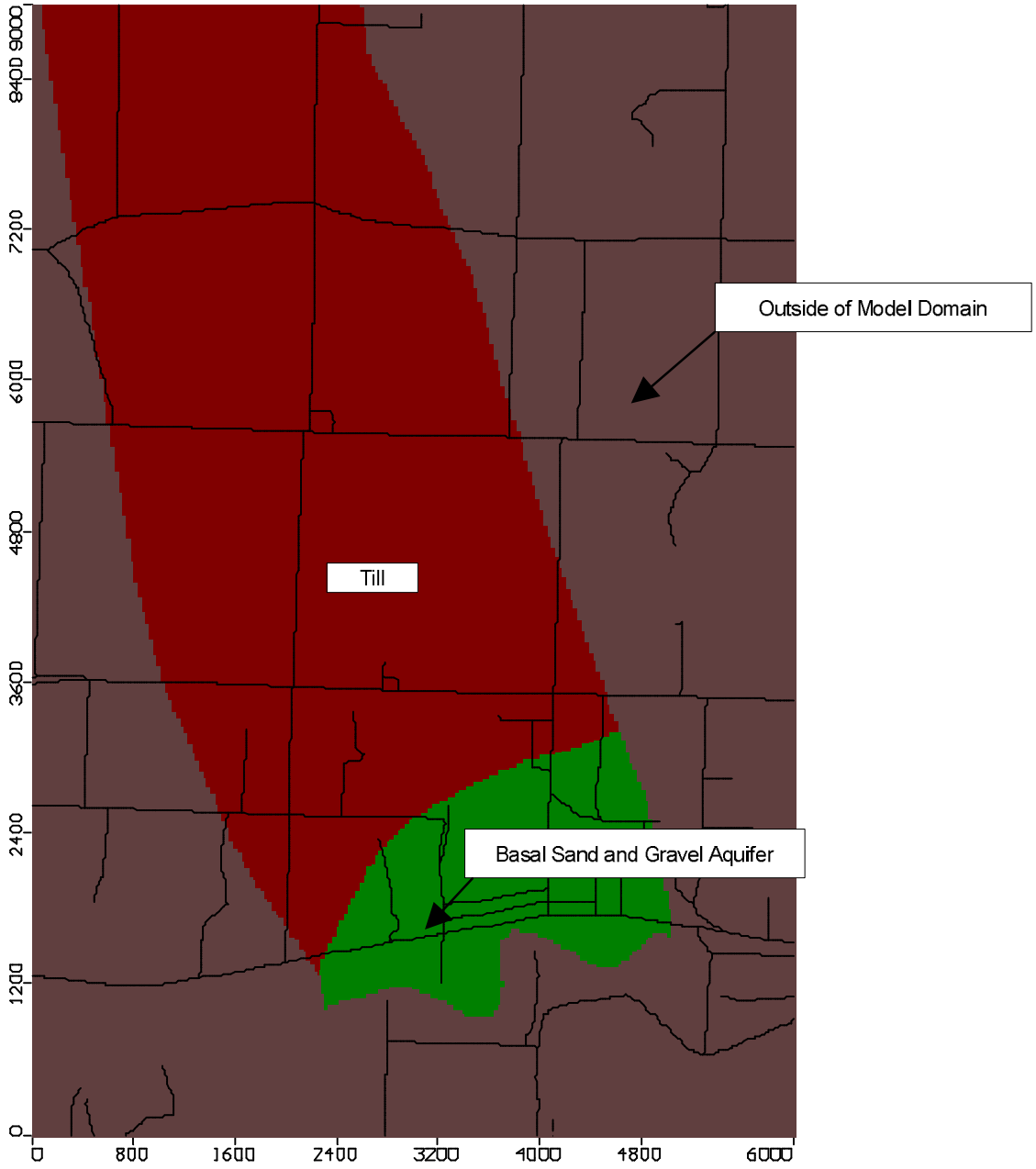
Prepared by: J. Zaidel, C. Reynolds

Verified by: P. Rider

BURNSIDE amec

XREF:

HA034966 MODEL FIGURE 2.DWG



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 3
Basal Sand and Gravel Aquifer and Till Zone
(Model Layer 4)

This figure is to be read in conjunction with the Thunder Bay Area Regional Groundwater Management and Protection Study.

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July 2005
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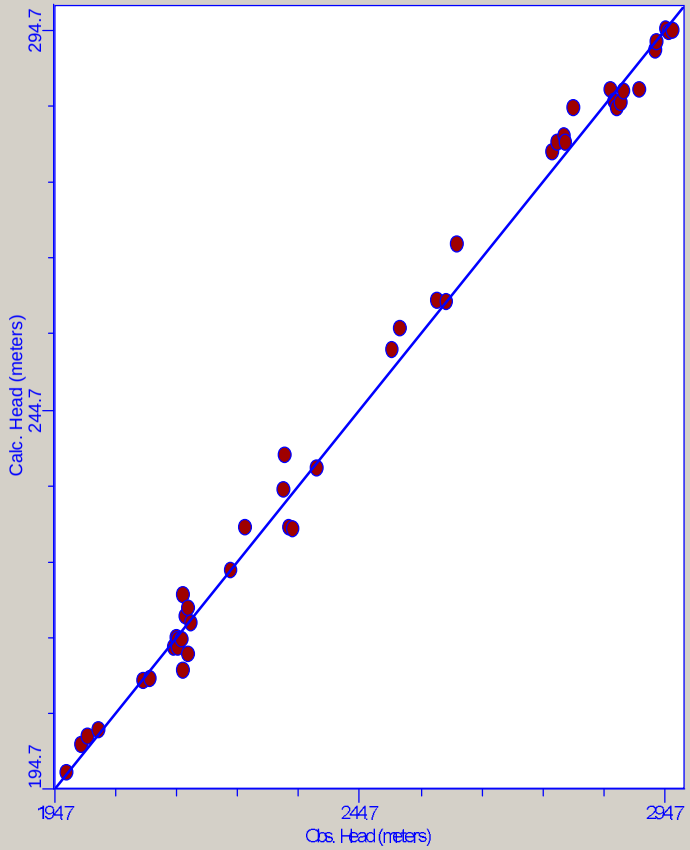
Prepared by: J. Zaidel, C. Reynolds

Verified by: P. Rider

BURNSIDE amec

XREF:

HA034966 MODEL FIGURE 3.DWG



Num.Points : 45
Mean Error : 0.29 (meters)
Mean Absolute : 2.05 (meters)
Standard Error of the Estimate : 0.40 (meters)
Root mean squared : 2.67 (meters)
Normalized RMS : 2.68 (%)

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 4
Calibration Results - Computed versus Observed Hydraulic Head

This figure is to be read in conjunction with the Thunder Bay Area Regional Groundwater Management and Protection Study.

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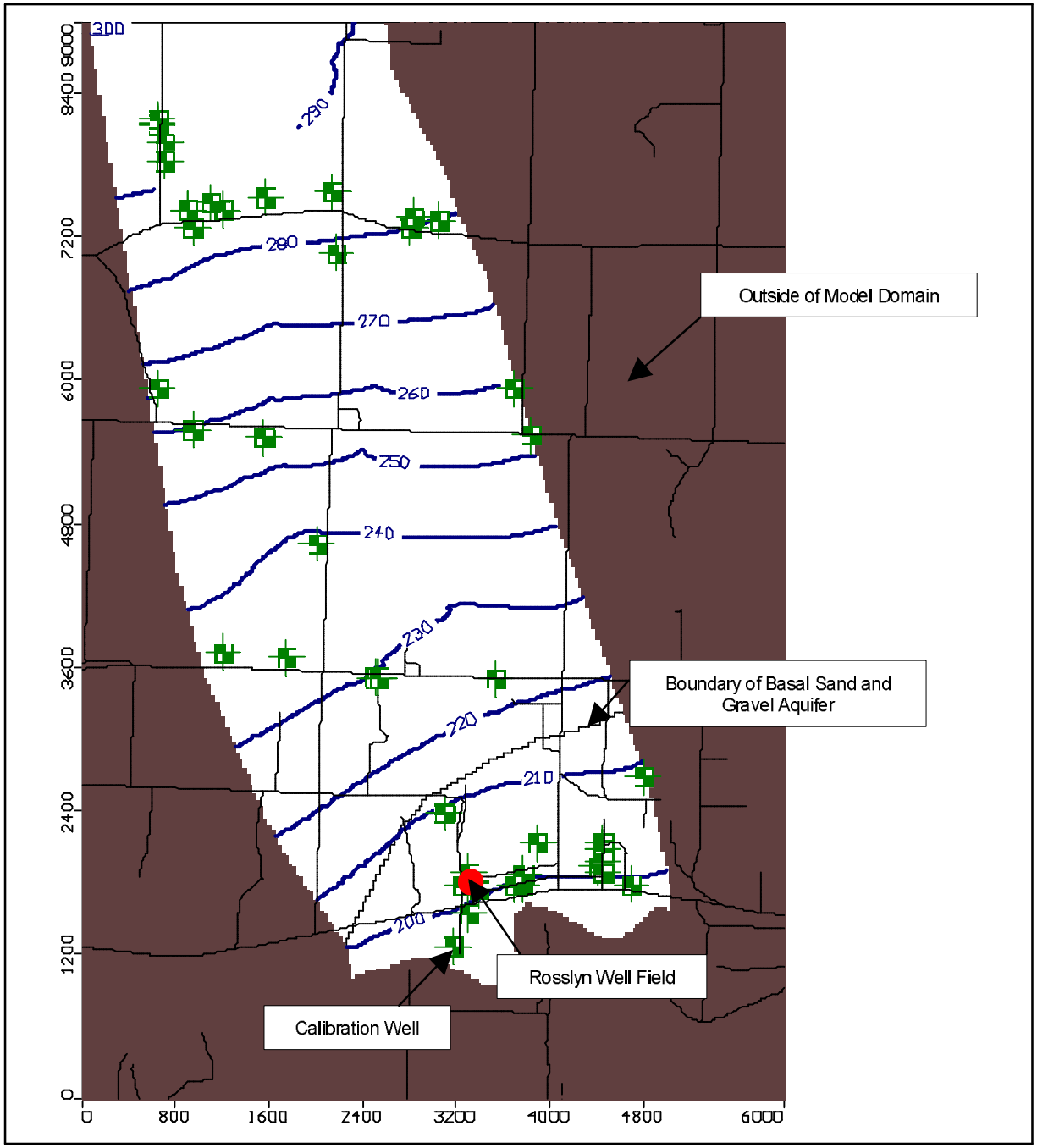
XREF:

HA034966 MODEL FIGURE 4.DWG



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 5
Simulated Groundwater Flow System (Model Layer 4)

This figure is to be read in conjunction with the Thunder Bay Area Regional Groundwater Management and Protection Study.

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Verified by: P. Rider

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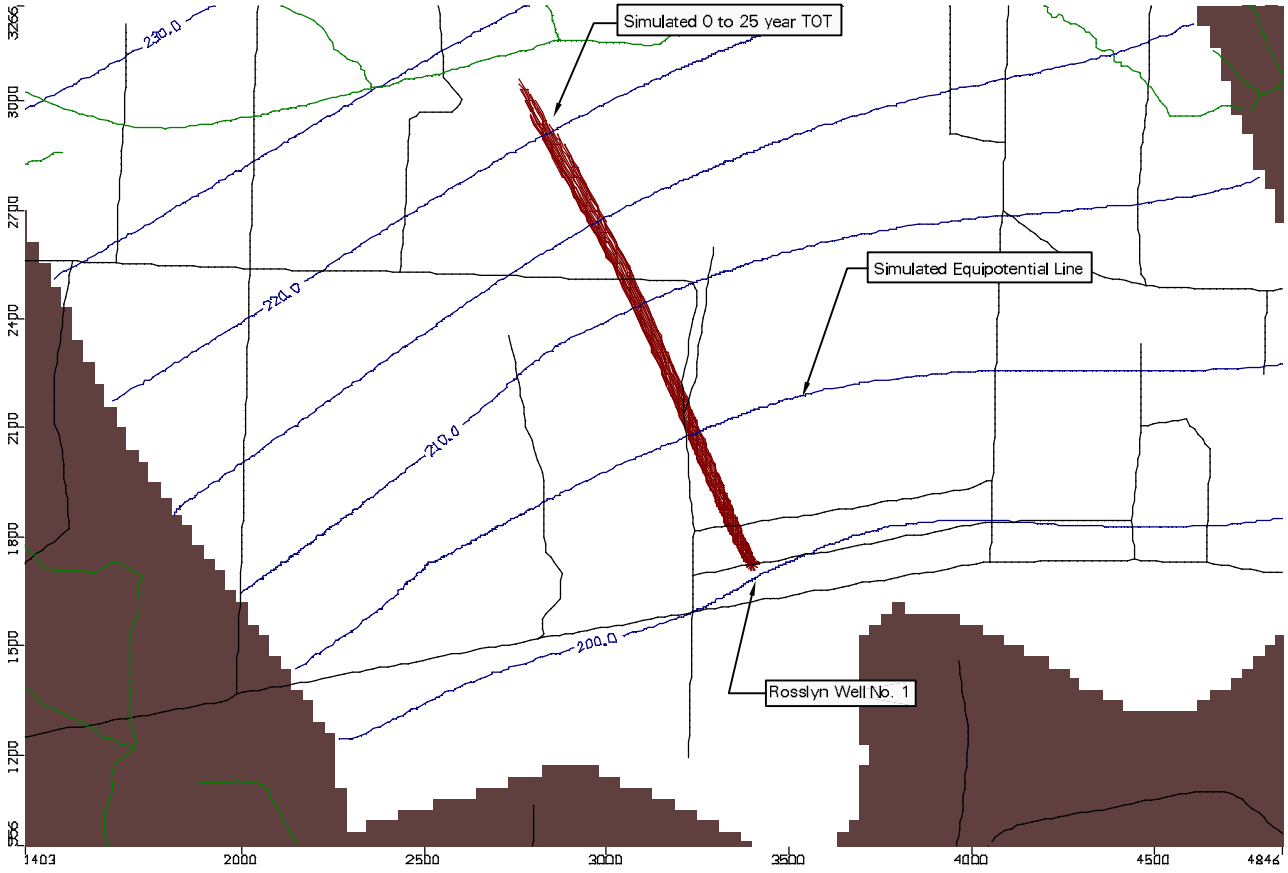

Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 6
Simulated 25 Year TOT for Rosslyn Well No. 1

This figure is to be read in conjunction with the Thunder Bay Area Regional Groundwater Management and Protection Study.

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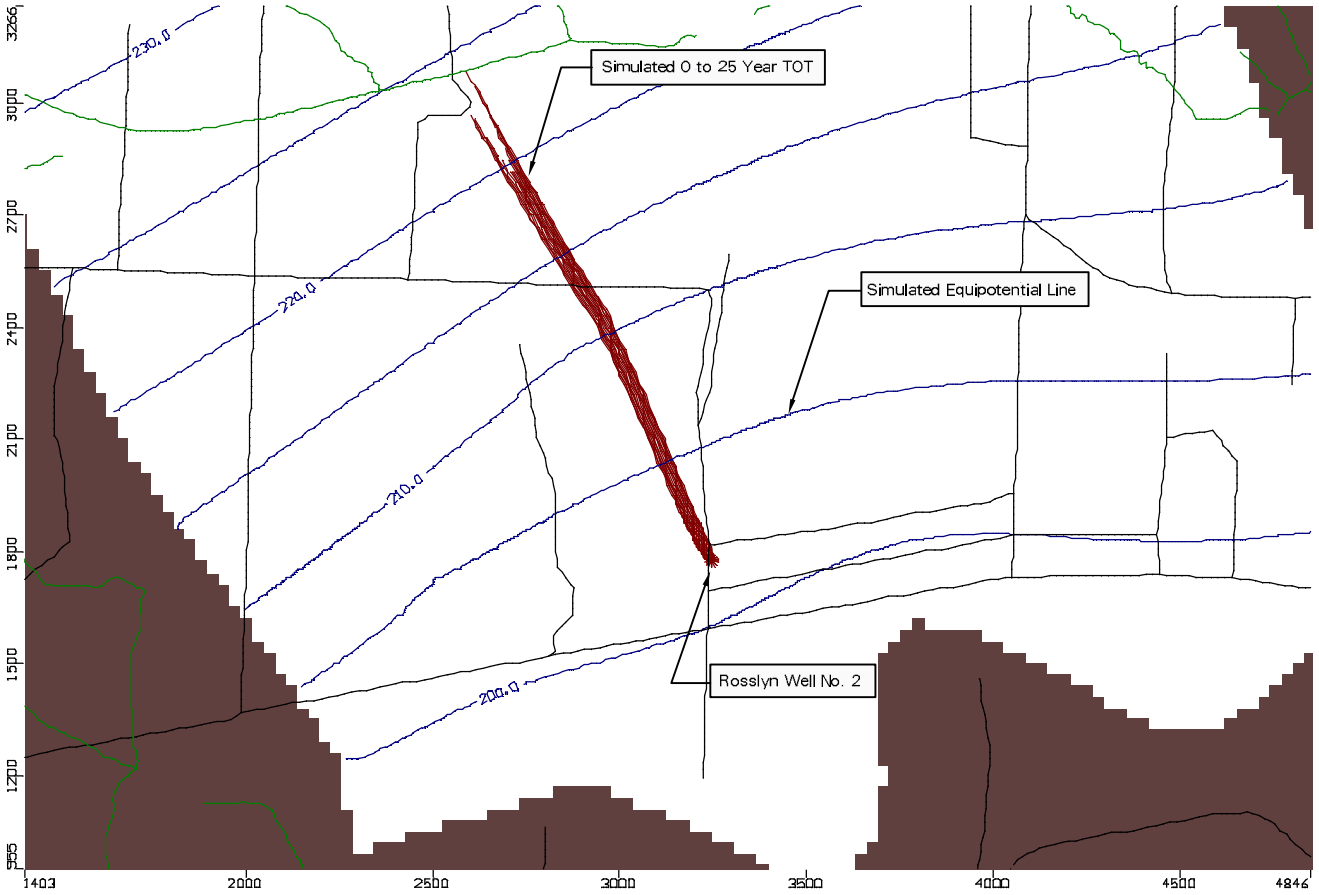
HA034966 MODEL FIGURE 6.DWG



Thunder Bay Area Regional Aquifer Characterization, Groundwater Management and Protection Study

FIGURE 7
Simulated 25 Year TOT for Rosslyn Well No. 2

This figure is to be read in conjunction with the Thunder Bay Area Regional Groundwater Management and Protection Study.

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July 2005
Project Number: HA 03 4966

Prepared by: J. Zaidel, C. Reynolds Verified by: P. Rider

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HA034966 MODEL FIGURE 7.DWG

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Appendix F
Groundwater Assessment

Table F-1
Groundwater Permits to Take Water

Permit Number	Source Name	Date Issued	Lot	Conc.	General Purpose	Specific Purpose	Other Purposes (Details)	Expiry Date	Max Litres Per Day	Days Taking Per Year	Hours Per Day Max	Litres Per Minute	Street Address	Draw Location same as Address	Surface and/or Groundwater	Lake, River, Stream Name	Number of Wells	Number of Springs	Number of Ponds	Well Type	Length Of Period	Seasonal End	StartDate	Comment	Easting	Northing
72-P-412	Pond	10/23/1972	16	C	Commercial	Snow making		3/31/2003	681000	365		0		Yes	G		1	0	1						352895	5376986
72-P-412	Well	10/23/1972	16	C	Commercial	Snow making		3/31/2003	1570000	365		0		Yes	G		1	0	1						352734	5377182
99-P-6049	Well No. 1	12/16/1999	C	1	Commercial	Bottled Water		12/20/2001	45284	250	14	56	R.R. #1, Kakabeka Falls, ON	Yes	G		2	0	0	drilled	2 years		12/20/1999		307301	5366970
99-P-6049	Well No. 2	12/16/1999	C	1	Commercial	Bottled Water		12/20/2001	30549	250	14	36	R.R. #1, Kakabeka Falls, ON	Yes	G		2	0	0	drilled	2 years		12/20/1999		307355	5367030
02-P-5002	w ell #1	6/28/2002	23,24	10	Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012	59803	365		54.6		Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994	631550	5124340
02-P-5002	w ell #2	6/28/2002	23,24	10	Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012	59803	365		36.7		Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994	631550	5124340
02-P-5002	w ell #3	6/28/2002	23,24	10	Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012	13075	24		54.6		Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994	631550	5124340
02-P-5002	w ell #4	6/28/2002	23,24	10	Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012	59803	365		1137		Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994	631550	5124340
02-P-5002	Wells No. 1	6/28/2002	23	10	Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012	78624	365	24	54.6	Nipissing Manor Nursing Care	Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994	631550	5124340
02-P-5002	Well No. 2	6/28/2002	23	10	Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012	52848	365	24	36.7		Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994	631550	5124340
02-P-5002	Well No.3	6/28/2002	23	10	Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012	78624	365	24	54.6		Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994	631550	5124340
02-P-5002	Well No. 4	6/28/2002	23	10	Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012	163728	365	24	113.7		Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994	631550	5124340
02-P-5002		6/28/2002			Commercial	Mall / Business	POTABLE WATER FOR NURSING HOME.	6/30/2012						Yes	G		4	0	0	drilled	10 years		7/1/2002	The w ells w ere installed by the MTO betw een 1990 and 1994		
02-P-6042	de-w atering pit	10/31/2002			Construction	Other - Construction	de-w atering	10/20/2003	576000	365	24	400	901 Atlantic Ave.	Yes	G		1	0	0	dug	1 year		10/31/2002		335276	5362725
67-P-44	Well	3/6/1967	10	2	Industrial	Food Processing		4/1/1973	45424	365				Yes	G		1	0	0						312857	5366224
74-P-6002	w ell	8/8/1974	6	2	Industrial	Other - Industrial	Reserve Well	3/31/1994	68190	365				Yes	G	Kaministikw ia River	1	0	0						320800	5360620
74-P-6017	Kaministikw ia River	12/17/1974	8	1	Industrial	Other - Industrial	Reserve Well	3/31/1994	68100	365				Yes	S	Kaministikw ia River	1	0	0						320082	5359552
91-P-6014	on Site, AWA Ditch Well	5/9/1991	12	1	Remediation	Groundw ater		7/29/1992	265000	360			1535 City Rd	Yes	G		1	0	0		10 years	3/31/2002	5/9/1991		328499	5358426
92-P-6018	Sterling Pulp Chemicals Site, Storm Ditch	7/29/1992	12	1	Remediation	Groundw ater		3/31/2003	265000	365		0		Yes	G		1	0	0						328501	5358424
73-P-501	Well	10/23/1973	12	1	Water Supply	Municipal		3/31/1983	261854	7				Yes	G		1	0	0						318511	5358977
92-P-6012	w ell	6/12/1996			Water Supply	Municipal		3/31/2003	106376	365		0		Yes	G		1	0	0						355101	5376724
00-P-6073	North Well		12	1 NKR	Water Supply	Municipal		11/30/2010	27500	365	24			Yes	G	Kaministikw ia R.	2	0	0	drilled	10 years		12/8/2000	Municipality has never had a Permit for this source, Permit has been applied for in response to Inspection ID # 686. Proponent has also applied for a CoA under Section 52 OWRA. No claims of interference from this source have been filed.	318409	5359730
00-P-6073	South Well		12	1 NKR	Water Supply	Municipal		11/30/2010	55000	365	24			Yes	G	Kaministikw ia R.	2	0	0	drilled	10 years		12/8/2000	Municipality has never had a Permit for this source, Permit has been applied for in response to Inspection ID # 686. Proponent has also applied for a CoA under Section 52 OWRA. No claims of interference from this source have been filed.	318410	5359716
									3650.855																	

Table F-2
Surface Water Permits to Take Water

Permit Number	Source Name	Date Issued	Lot	Conc.	General Purpose	Specific Purpose	Purpose Details	Expiry Date	Max Litres Per Day	Days Taking Per Year	Hours Per Day Max	Litres Per Minute	Street Address	Draw Location same as Address	Surface and/or Groundwater	Lake, River, Stream, Name	Watershed Name	Sub-Watershed Name	Number of Springs	Number of Ponds	Pond Type	Length Of Period	Seasonal Start	Seasonal End	StartDate	Comment	Easting	Northing
78-P-6009	Slate River	5/12/1978	9	2	Agricultural	Field and Pasture Crops		2/29/1980	368226	42				Yes	S	Slate River			0	0							319422	5355392
88-P-6009	Slate River		10	2	Agricultural	Fruit Orchards	Irrigation	3/31/1998	45400	365				Yes	S	Slate River			0	0							315900	5348607
88-P-6014	Corbett Creek		24	2	Agricultural	Other - Agricultural	Irrigation	3/31/1998	3182200	365				Yes	S	Corbet Creek			0	1							313666	5361503
88-P-6014	Pond		24	2	Agricultural	Other - Agricultural	Irrigation	3/31/1998	3182200	365				Yes	S	Corbet Creek			0	1							313637	5361520
96-P-6013	Slate River	8/5/1996	6	3	Agricultural	Field and Pasture Crops		10/30/2006	545520	365		0		Yes	S	Slate River			0	0							320606	5354884
98-P-6094	Slate River	11/5/1998	9, 10	3	Agricultural	Field and Pasture Crops		9/30/2008	109104	365		0		Yes	S	Slate River			0	0						When flow in river is 120L/s, which corresponds to a water level of 3.57 m on the staff guage, water taking must not exceed 109104 Litres/Day. When flow in river is 108 L/s, which corresponds to a water level of 3.22 m, water must be taken on Mondays, Wednesdays and Fridays only, of which the total taking must not exceed 109104 Litres/day. When flow in river is 72 L/s, which corresponds to a water level of 2.4 metres, there must not be any taking of water from the river for the purpose of irrigation.	319000	5355718
98-P-6893		11/4/1998	6	1	Agricultural	Field and Pasture Crops		9/15/2008	136380	365		0		Yes	S	Kaministiquia River			0	0							321001	5356724
99-P-6026	Slate River	6/22/1999	2	2	Agricultural	Field and Pasture Crops		5/1/2004	300000	365		500		Yes	S	Kaministiquia River			0	0							321883	5355530
02-P-6055	Ground water pond	1/15/2003	6	3	Agricultural	Field and Pasture Crops		9/1/2013						Yes	G	Groundwater Pond			0	1	Dugout	10 years	5/1/2003	9/1/2003			320606	5354884
74-P-6015	creek	11/28/1974	12	3	Commercial	Golf Course Irrigation		3/31/2002	262000	365		0		Yes	S	Mosquito Creek			0	0							328578	5360692
74-P-61	Kaministiquia River	3/5/1974	11	1	Commercial	Snowmaking		3/31/1990	7993920	100				Yes	S	Kaministiquia River			0	0							329001	5357244
75-P-6007	Wolf River	8/20/1975	1	5	Commercial	Aquaculture	Fish hatchery	3/31/2003	15120000	365		0		Yes	S	Wolf River			0	0							384101	5410724
76-P-6011	Spring Creek	2/11/1976	1	6	Commercial	Aquaculture	Fish hatchery	3/31/2003	39225600	365		0		Yes	S	Wolf River			0	0							382393	5410921
77-P-6012	Corbett Creek	7/27/1977	10	1	Commercial	Other - Commercial		3/31/1987	0	365		0	(NO INFO on Water taking)	Yes	S	Corbett Creek			0	1	On-Stream					Permit for diversion with no quantities specified.	312892	5364736
80-P-6010	Kaministiquia River	8/18/1980	11	1	Commercial	Snowmaking		3/31/1990	8000000	100				Yes	S	Kaministiquia River			0	0							328999	5357246
81-P-6002	Kamini..... River	2/19/1981	14	1	Commercial	Other - Commercial	Dust Control	3/31/2003	68100	365		0		Yes	S	Kaministiquia River			0	0							327530	5357169
86-P-6024	SW Quarter of Section 6	4/21/1997	6	1	Commercial	Snowmaking		3/31/2007	545530	10		0		Yes	S	McQuaig Lage			0	0							322497	5349921
90-P-6001	Kaministiquia River	4/25/1990	13	A	Commercial	Other - Commercial		3/31/2000	648000	30		0		Yes	S	Kaministiquia River			0	0		10 years	6/1/2000	10/1/2000			318000	5359116
92-P-6010	spring	6/12/1992	6	2	Commercial	Aquaculture		3/31/2003	50000	365		0		Yes	G				1	0							300300	5368108
93-P-6035	Thunder Lake	12/5/1995			Commercial	Aquaculture		12/5/2005	432000	365		0		Yes	S	Thunder Lake			0	0							296000	5375206
97-P-6045	McQuaig Lake, Section 6	6/17/1997		1	Commercial	Snowmaking		4/30/2007	454600	100		0		Yes	S	Dugout Reservior			0	0							322500	5349912
97-P-6099	pond	10/9/1997	6	9	Commercial	Aquaculture		9/30/2007	0	365		0		Yes	B	Surface runoff			0	1	Dugout					Permit for dugout pond with maximum capacity of 4114130 litres.	309626	5324212
00-P-6023	Neebing River	7/24/2000	2	4	Commercial	Golf Course Irrigation		7/21/2005	1091040	215	24	757.6		No	S	Neebing River			0	0		5 years			7/21/2000		332729	5362980
01-P-4017	Quarry	6/4/2001	29	II	Construction	Road Building		7/22/2001	70000	15	1	1800		No	B				0	1	Pit or Quarry	1 month				Permit issued with conditions. No water shall be taken by the Permit Holder if any other person or company is extracting water from the quarry. The Permit Holder shall notify the Director and the quarry owner immediately upon discovery of the other water taking avtivity.		
79-P-6005	Lake Superior	8/24/1979			Construction	Road Building		3/31/2004	543338	365		0		Yes	S	Lake Superior			0	0							335613	5361831
84-P-6010	Pitch Creek	5/11/1984	3	6	Construction	Road Building		6/24/1984	285034	130				Yes	S	Pitch Creek			0	0							293634	5363010
85-P-6010	Savanna River				Construction	Road Building		3/31/1986	200000	90				Yes	S	Savanna River and Re			0	0								
85-P-6010	Rest Creek				Construction	Road Building		3/31/1986	200000	90				Yes	S	Savanna River and Re			0	0								
87-P-6032	McKay Creek				Construction	Road Building		3/31/1988	181840	60				Yes	S	McKay Creek			0	0								
88-P-6003	East Dog River				Construction	Road Building		3/31/1989	90920	365			Spruce River Rd.	Yes	S	East Dog River			0	0							345177	5408441
88-P-6008	Surprise Lake				Construction	Road Building		3/31/1989	545000	150				Yes	S	Surprise Lake and Le			0	0							328288	5388574
88-P-6008	Lerome Lake				Construction	Road Building		3/31/1989	54552	150				Yes	S	Surprise Lake and Le			0	0							593844	5399153
91-P-6035	pond	7/11/1991	14	8	Construction	Road Building		3/31/1992	68190	100				Yes	S				0	1	On-Stream	1 year		3/31/2002	7/11/1991		328101	5388722
94-P-6051	West Loon Lake		8	8	Construction	Road Building		12/31/1994	45460	90				Yes	S	West Loon Lake			0	0							369911	5388237
94-P-6052	Coldwater Creek		10	2	Construction	Road Building		12/31/1994	45460	150				Yes	S	Coldwater Creek, Bob			0	0							387008	5406826
94-P-6052	Bob Atkinson Pond				Construction	Road Building		12/31/1994	45460	150				Yes	S	Coldwater Creek, Bob			0	0								
94-P-6052	Wolf River				Construction	Road Building		12/31/1994	45460	150				Yes	S	Coldwater Creek, Bob			0	0							387486	5408715
95-P-6030	West Loon Lake	5/20/1995			Construction	Road Building		10/31/1995	50000	60				Yes	S	West Loon Lake			0	0								
95-P-6031	Bob Atkinson Pond	5/20/1995			Construction	Road Building		10/31/1995	45460	60				Yes	S	Bob Atkinson Pond			0	0								
95-P-6031	Wolf River	5/20/1995			Construction	Road Building		10/31/1995	45460	60				Yes	S	Bob Atkinson Pond			0	0								
95-P-6058	Drainage Ditch	8/3/1995			Construction	Road Building		10/31/1995	45460	90				Yes	G				0	0								
95-P-6061	Blackwater River	8/16/1995			Construction	Road Building		10/31/1995	45460	75				Yes	S	Blackwater River and			0	0							430844	5495591
95-P-6061	Blackwater Bay	8/16/1995			Construction	Road Building		10/31/1995	45460	75				Yes	S	Blackwater River and			0	0								
96-P-6051	Kaministiquia River	9/10/1996	33	A	Construction	Road Building		9/28/1996	68190	14				Yes	S	Kaministiquia River			0	0							309903	5360144
97-P-6043	Kenel Creek/NASI	4/23/1997			Construction	Road Building		9/26/1997	250000	90				Yes	S	Kenel Creek, Wabikob			0	0							584024	5395227
97-P-6043	Wabikoba River	4/23/1997			Construction	Road Building		9/26/1997	250000	90				Yes	S	Kenel Creek, Wabikob			0	0								
97-P-6043	Dunc Lake	4/23/1997			Construction	Road Building		9/26/1997	250000	90				Yes	S	Kenel Creek, Wabikob			0	0								
97-P-6043	White Lake	4/23/1997			Construction	Road Building		9/26/1997	250000	90				Yes	S	Kenel Creek, Wabikob			0	0								
97-P-6094	Matawin River	8/13/1997	37	A	Construction	Road Building		10/31/1997	872824	100				Yes	S	Matawin River			0	0							302180	5380261
98-P-6028	Dawson Rd. Lots	4/21/1998	37	A	Construction	Road Building		9/30/1998	872824	120				Yes	S	Matawin River			0	0								
01-P-4031	Quarry	9/21/2001	4, 5, 15	V	Dewatering	Pits and Quarries	The quarry/pool is dewatered for cleaning.	9/21/2006	1728000	4	24	1200		Yes	G				0	1	Pit or Quarry	5 years						
01-P-4031	Quarry	9/21/2001	4, 5, 15	V	Dewatering	Pits and Quarries	The quarry/pool is dewatered for cleaning.	9/21/2006	144000	56	24	100		Yes	G				0	1	Pit or Quarry	5 years						
01-P-4031	?	9/21/2001			Dewatering	Pits and Quarries	The quarry/pool is dewatered for cleaning.	9/21/2006	45824	365	24	32		Yes	G				0	1	Pit or Quarry	5 years						
77-P-6009	Gravel Pit	6/16/1977	34	2	Dewatering	Pits and Quarries		3/31/1988	2273000	365				Yes	G				0	1	Pit or Quarry						309583	5362370
80-P-6009	Pond	6/24/1980	32	1	Dewatering	Pits and Quarries		3/31/1990	81828	365				Yes	S				0	1	Dugout						310179	5361224
84-P-6008	Falcon Bridge Pit	5/23/1984			Dewatering	Pits and Quarries		3/31/1986	2260000	365				Yes	G				0	1	Pit or Quarry							
90-P-5802	Gravel Pit	6/7/1990	20, 21		Dewatering	Pits and Quarries		3/31/1995	6546240	210				Yes	S				0	1	Pit or Quarry	5 years		3/31/2002	6/7/1990			
92-P-6001	Upper Hunters Lake	2/4/1992	Section 3	6	Dewatering	Pits and Quarries		3/31/2003	3273120	120		0		Yes	S	Upper Hunters L. and Elbow L.			0								372760	5394942
92-P-6001	Gravel Pit	2/4/1992	Section 4	6	Dewatering	Pits and Quarries		3/31/2003	363680	40		0		Yes	S	Upper Hunters L. and Elbow L.			0								372872	5394536
92-P-6001	Elbow Lake	2/4/1992	Section 4	6	Dewatering	Pits and Quarries		3/31/2003	272760	80		0		Yes	S	Upper Hunters L. and Elbow L.			0								372491	5394438
92-P-6024	Lac Des Iles	11/25/1992			Dewatering	Pits and Quarries		1/4/1994	1818400	365				Yes	S				0	1	Pit or Quarry	10 years		3/31/2002	11/25/1992			
94-P-6059	Old Mine, Eagle River	11/4/1994			Dewatering	Other - Dewatering	mine workings	1/15/1995	250000	365				Yes	G				0	0								
94-P-6065	Water Body C3 - Pond				Dewatering	Other - Dewatering	Mine Workings	12/31/1994	250000	365				Yes	G				0	0								
94-P-6065	Water Body C3 - Ramp				Dewatering	Other - Dewatering	Mine Workings	12/31/1994	200000	365				Yes	G				0	0								
96-P-6069	trench	12/31/1996			Dewatering	Construction	Trench dewatering to minimum depth to enable the installation of a new natural gas pipeline.	3/28/1997	26000000	10				Yes	S				0	0							685363	5433830
96-P-6069	Upsala Creek	12/31/1996			Dewatering	Construction	Trench dewatering to minimum depth to enable the installation of a new natural gas pipeline.	3/28/1997	3600000	10				Yes	S				0	0							685597	5433932
96-P-6069	Little Savanne River	12/31/1996			Dewatering	Construction	Trench dewatering to minimum depth to enable the installation of a new natural gas pipeline.	3/28/1997	3600000	10				Yes	S				0	0								
66-P-290	Kaministikwia River	7/29/1966	12	1	Industrial	Manufacturing		3/31/1987	163528712	365				Yes	S	Kaministikwia River			0	0								
67-P-467	Selim Creek & Hewitson River	12/21/1967			Industrial	Other - Industrial	Mineral processing	12/21/1967	1309248	365				Yes	S	Lake Superior			0	0								
73-P-112	MacIntyre Creek	4/17/1973	16	2	Industrial	Aggregate Washing		3/31/2003	54552000	365		0		Yes	S	McIntyre River			0	0							326816	5379309
74-P-6006	Crystal Creek	8/9/1974	10	7	Industrial	Other - Industrial		3/31/1989	6546240	365				Yes	S	Crystal Creek, Arrow			0	0							304154	5327436

Table F-2
Surface Water Permits to Take Water

Permit Number	Source Name	Date Issued	Lot	Conc.	General Purpose	Specific Purpose	Purpose Details	Expiry Date	Max Litres Per Day	Days Taking Per Year	Hours Per Day Max	Litres Per Minute	Street Address	Draw Location same as Address	Surface and/or Groundwater	Lake, River, Stream, Name	Watershed Name	Sub-Watershed Name	Number of Springs	Number of Ponds	Pond Type	Length Of Period	Seasonal Start	Seasonal End	StartDate	Comment	Easting	Northing
74-P-6006	Arrow River	8/9/1974	5	3	Industrial	Other - Industrial		3/31/1989	32731200	365				Yes	S	Crystal Creek, Arrow			0	0								
77-P-6001	Mission Island	4/22/1977	1	K	Industrial	Cooling Water		10/15/2006	1300000000	365		0		Yes	S	Mission River			0	0						March 6, 1997 renewal issued without expiry date. Oct 15, 2001 expiry date issued.	334501	5359024
77-P-6002	Welch River	6/16/1977	Mining Location C		Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1978	5632494	270				Yes	S	Welch River			0	0							383033	5397212
77-P-6003	McKenzie River	6/16/1977	Mining Location 8	Section 7	Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1978	6546240	270				Yes	S	McKenzie River			0	0							357016	5378463
77-P-6004	Little Current River	6/16/1977			Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1978	1692203	270				Yes	S	Little Current River			0	0							344721	5382472
77-P-6005	Current River	6/16/1977	6	3	Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1978	2459386	270				Yes	S	Current River			0	0							334647	5380234
77-P-6006	Wolf River	6/16/1977	12	2	Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1978	6546240	270				Yes	S	Wolf River			0	0							387498	5408694
77-P-6014	Walkinshaw Creek	7/27/1977	8	A	Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1978	6546240	240				Yes	S	Walkinshaw Creek			0	0							355446	5379898
77-P-6015	Lake Superior	10/28/1977			Industrial	Cooling Water		3/31/1987	628439	365			34 N. Cumberland St.	Yes	S	Lake Superior			0	0							335854	5365292
81-P-6003	Strawberry Creek	2/19/1981	12	A	Industrial	Aggregate Washing		3/31/1986	6550000	365				Yes	S	Strawberry Creek			0	0							310701	5378971
82-P-6004	Wolf River	8/11/1982	1	5	Industrial	Other - Industrial	Hydro-Electric	3/31/2003	18341600	365		0		Yes	S	Wolf River			0	0							384069	5410868
82-P-6006	Harbour of Thunder Bay	11/16/1982			Industrial	Brewing and Soft Drinks		3/31/2003	2270000	365		0		Yes	S	Lake Superior			0	0							333501	5360424
84-P-6006	Strawberry Creek	4/24/1984	14	A	Industrial	Aggregate Washing		3/31/2006	6550000	213		0		Yes	S	Strawberry Creek			0	0							310703	5378970
84-P-6013	Eaglehead River	7/20/1984			Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1985	6000000	3				Yes	S	Eaglehead River			0	0								
85-P-6007	Theresa Lake				Industrial	Other - Industrial	Low flow augmentation for Cedar Creek	3/1/1990	0	365		0		Yes	S	Theresa Lake			0	0						Permit for dam with no quantities specified.		
87-P-6015	Water Intake #1 UpStream Intake (Kraft)	5/4/1987	11	1	Industrial	Manufacturing	Pulp and Paper Mill	10/15/2006	216000000	365		0		Yes	S	Kaministiquia River			0	0						Mar. 2, 1997 renewal issued without expiry date. Oct 15, 2001 expiry date issued.	329009	5357256
87-P-6014	Coleman Lake				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1988	10000000	3				Yes	S	Coleman Lake and Unn			0	0							461807	5503594
87-P-6014	Unnamed Lake				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1988	10000000	3				Yes	S	Coleman Lake and Unn			0	0								
87-P-6019	Obie Creek				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1988	2000000	5				Yes	S	Obie Creek, Odic Lak			0	0								
87-P-6019	Odic Lake				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1988	2000000	5				Yes	S	Obie Creek, Odic Lak			0	0							420329	5472796
87-P-6019	Postigoni River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1988	2000000	5				Yes	S	Obie Creek, Odic Lak			0	0							420395	5479962
87-P-6022	Unnamed Lake				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1988	25000000	5				Yes	S	Unnamed Lake and Taf			0	0								
89-P-6004	Little Savanne River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	90000000	10				Yes	S	Little Savanne River			0	0							701030	5426088
89-P-6004	Ottoson Lake		9	1	Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	90000000	10				Yes	S	Little Savanne River			0	0							681115	5433715
89-P-6004	Inwood Creek				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	15000000	3				Yes	S	Little Savanne River			0	0							687836	5430731
89-P-6004	Rabbit Lake		7	6	Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	30000000	10				Yes	S	Little Savanne River			0	0							395730	5516125
89-P-6004	Unnamed Swamp		7	6	Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	30000000	10				Yes	S	Little Savanne River			0	0							395689	5516500
89-P-6004	Island Lake Creek		11	6	Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	30000000	10				Yes	S	Little Savanne River			0	0							404795	5518341
89-P-6004	Unnamed Pond				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	11552750	10				Yes	S	Little Savanne River			0	0								
89-P-6004	Gulliver River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	6268900	10				Yes	S	Little Savanne River			0	0								
89-P-6004	Unnamed Pond				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	8060050	10				Yes	S	Little Savanne River			0	0								
89-P-6004	Firesteel River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	21314400	10				Yes	S	Little Savanne River			0	0							669839	5436940
89-P-6004	Eaglehead River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	3582250	10				Yes	S	Little Savanne River			0	0								
89-P-6004	Osaquan River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1990	18787700	10				Yes	S	Little Savanne River			0	0								
91-P-6003	Spruce River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1992	16400000	90				Yes	S	Spruce River			0	0								
91-P-6007	Dog River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1992	16400000	90				Yes	S	Dog River			0	0								
91-P-6008	Block Creek				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1992	16400000	90				Yes	S	Block Creek			0	0								
91-P-6009	Kenogami River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1992	16400000	90				Yes	S	Kenogami River			0	0								
91-P-6010	Catherine Lake				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1992	16400000	90				Yes	S	Catherine Lake			0	0								
93-P-6005	Tributary to Dionne Creek				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1994	53700000	90				Yes	S	Dionne Creek			0	0								
93-P-6006	Ashmore Creek				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1994	71500000	90				Yes	S	Ashmore Creek			0	0								
93-P-6007	Dog River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1994	79000000	90				Yes	S	Dog River			0	0								
93-P-6008	Unnamed Lake				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1994	79000000	90				Yes	S	Unnamed Lake			0	0								
93-P-6012	Dionne Creek				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1994	71500000	90				Yes	S	Dionne Creek			0	0								
93-P-6021	Blackwater River				Industrial	Pipeline Testing	Hydrostatic testing.	3/31/1994	18000000	90				Yes	S	Blackwater River			0	0								
94-P-6027	PTS 56 & 57	5/17/1994	8	1	Industrial	Other - Industrial	Scrap Yard	3/31/2004	2880000	365		0	Montreal St.	Yes	S	Kaministiquia River			0	0							330057	5358258
94-P-6034	Blackwater River				Industrial	Pipeline Testing	Hydrostatic testing.	12/31/1994	8400000	5				Yes	S	Blackwater River			0	0								
94-P-6049	Angle Creek				Industrial	Pipeline Testing	Sandpainting.	1/1/1995	3927744	14				Yes	S	Angle Creek			0	0								
95-P-6020	Lake Superior	6/22/1995	2, 3	Herrick s Survey	Industrial	Other - Industrial	Pulp	6/22/2005	39277440	365		0		Yes	S	Lake Superior			0	0							341001	5371223
97-P-6023	Water Intake No. 2, Distream Intake (News	3/7/1997	11	1	Industrial	Other - Industrial	Paper Mill	10/15/2006	144000000	365		0		Yes	S	Kaministiquia River			0	0						This Permit was issued without an expiry date. Oct 15, 2001 expiry date issued.	329001	5357254
97-P-6047	Spring / Seep	6/23/1997	16	1	Industrial	Other - Industrial	Concrete	11/10/1997	45460	365				Yes	S				0	1	Pit or Quarry						316799	5359772
97-P-6049	Current River	5/14/1997	6	4	Industrial	Pipeline Testing	Hydrostatic testing.	6/6/1997	12960000	6				Yes	S	Current River			0	0							334910	5381874
97-P-6065	Well points	6/20/1997			Industrial	Pipeline Testing	And construction at Station 77.	11/7/1997	3600000	130				Yes	G				0	0								
98-P-6008	TCPL Compressor Station 77, Jellicoe	2/3/1998			Industrial	Pipeline Testing		4/30/1998	2500000	120				Yes	G				0	0								
98-P-6052	Wolf River	5/22/1998	12	2	Industrial	Pipeline Testing		7/15/1998	425000	5				Yes	S	Wolf River			0	0							387517	5408662
99-P-6012	Cedar Creek, Golden Giant Mine	4/15/1999			Industrial	Aggregate Washing	Relocate recycle pump barge	5/31/1999	4752000	31				Yes	S	Cedar Creek			1	0								
01-P-6012	Mission River	5/15/2001	1	K	Industrial	Other - Industrial	Dust suppression	4/25/2005	277777	150	0.449999988	100000	Mission Island	Yes	S	Kaministiqwia R.			0	0		5 years				Permit will source outfall from TGS, water will be used on site for dust suppression.	335528	5358534
67-P-511	Neebing River	9/29/1967	6	3	Miscellaneous	Dams and Reservoirs		3/31/2003	50000	365		0		Yes	S	Neebing River			0	0							331304	5361895
69-P-234	Neebing River	6/27/1969			Miscellaneous	Dams and Reservoirs	Water Storage	3/31/1979	0	365		0	R.R. #12 Government Rd	Yes	S	Neebing River	Lake Superior	Neebing River	0	1	On-Stream					Permit for dam with no quantities specified.	323692	5371036
69-P-302	Neebing River	8/13/1969			Miscellaneous	Dams and Reservoirs		8/22/1979	7200	7				Yes	S	Neebing River			0	1							324359	5371061
70-P-429	McIntyre River	11/30/1970			Miscellaneous	Dams and Reservoirs		3/31/2003	73000	365		0		Yes	S	McIntyre River			0	0							332375	5365608
84-P-6014	Arrow River	8/20/1984	39	3	Miscellaneous	Other - Miscellaneous	Hydro-Electic for Home use	3/31/1994	24500000	365				Yes	S	Arrow River			0	0							285271	5331860
92-P-6016	Current River	6/30/1992			Miscellaneous	Dams and Reservoirs		3/31/2003		365		0		Yes	S	Current River			0	0						Permit for dam with no quantities specified.	337455	5369766
67-P-512	McIntyre River	12/29/1967	41		Recreational	Other - Recreational		3/31/1987	0	365		0	(no info on amt litres)	Yes	S	McIntyre River			0	0						Permit for dam with no quantities specified.	331540	5367960
88-P-6019	McIntyre River				Recreational	Other - Recreational	Ice Race Track	3/31/1989	909200	90				Yes	S	McIntyre River			0	0							333822	5363150
89-P-6005	Thunder Bay - Lake Superior				Remediation	Groundwater	Creosote Pools	3/31/1990	52400	30				Yes	S	Lake Superior			0	0							335901	5365324
95-P-6016		4/19/1995			Remediation	Other - Remediation	Soil	8/31/1995	5232600	1				Yes	S	Wabikon Creek			0	0								
01-P-6036	Quarry Pond	7/27/2001			Remediation	Other - Remediation	Surface water	8/17/2001		14	24			Yes	S				0	1	Pit or Quarry	2 weeks			7/30/2001		336136	5354873
74-P-6005	Tributary of Sturgeon Lake	8/8/1974			Water Supply	Other - Water Supply	Industrial Processing	4/6/1984	3182200	365				Yes	S	Sturgeon Lake			0	0								
83-P-6005	Caramat Lake	3/8/1983			Water Supply	Municipal		4/15/1999	75000	365				Yes	S	Caramat Lake			0	0						This permit was renewed on March 1999, this permit will now have an expiry date of expire March 31, 2009		
91-P-6015	Loch Lomond Lake	5/13/1991			Water Supply	Municipal		7/24/2007	77282000	365				Yes	S	Loch Lomond Lake			0	0		5 years					329000	5349213
91-P-6017	Lake Superior	5/13/1991			Water Supply	Municipal		7/24/2007	90900000	365			Bare Point Road	Yes	S	Lake Superior			0	0		5 years					339924	5369237
94-P-6001	Camp Lake	1/7/1994			Water Supply	Other - Water Supply	Emergency	1/21/1994	63644000	14				Yes	S	Camp Lake			0	0		1 month		1/21/2002	1/7/1994			
									3333627.837																			

Table F-3
Groundwater Chemistry

WELL ID	X	Y	NITRATE	SODIUM	CHLORIDE	HARDNESS	IRON	MANGANENSE
			10	20	250	80	0.3	0.05
BE136330	329444.09	5371819.084	0	7.93	17.14	185.3	0	0.05
BE17018	329458.76	5371954.685	0.04	5.06	9.86	272.5	0.24	0.03
BE136878	329839.37	5371607.659	0	17.6	17.78	186.4	0	0.09
BE136695	329707.74	5373551.36		18.74	19.86	130.2	0.01	0.01
BE47407	329819.34	5370007.042	0.04	5.76	24.51	231.2	0.26	0.057
BE112005	329710.38	5370180.276	8.52	75.86	11.71	150.4	0.23	0
BE32149	335397.62	5371969.944	0.03	2.33	198	231	0.01	0.163
BE47426	335428.04	5370872.711		0.209	361	309.8	0.6	0.02
6104792	335430.71	5370934.782	1.4	3.8	180.6	796.2	1.6	0
BE112763	335428.03	5371105.011	0.06	10.45	185.7	492.7	1.44	0
BE254840	335461.60	5372079.45	0.37	14	39.4	237	0.815	0.0403
BE136584	335391.27	5372681.359	0.12	9.75	5.57	197.6	0	0.01
6102744	335444.79	5372678.303	1.67	25.16	58.2	334	0	0.56
BE57166	335341.10	5373081.507	0.421	1.92	2.5	88.7	1.53	0.288
6104842	335339.80	5373127.113	0.17	4.41	6.37	373.23	0.04	0
6104576	335431.84	5373201.416	0.17	17.52	3.31	89.9	0	0.9
6104897	335437.17	5373322.621	0.56	3.96	2.22	202.93	0.31	0
BE112905	334562.31	5370459.756	1.49	67.66	62.76	664.5	23.41	0.41
BE136542	334109.41	5370467.894		16.59	12.73	321.4		0.01
BE112871	334737.96	5371139.146	1.12	6.07	55.58	288.5	0	0.02
BE112862	334751.18	5371128.135	0	2.76	9.61	144.7	0.03	0.03
BE112861	334739.07	5371116.757	0	58.43	23.32	143.8	0.02	0.03
BE136307	334762.94	5371273.76	0	23.4	20.55	161.2	0	0.08
BE136305	334774.35	5371378.243	0	34.09	35.4	198	0	0.08
6104926	334624.63	5372117.673	0.16	13.49	2.52	241.4	0.59	0
BE246139	324004.69	5369875.768						
BE47422	328370.11	5371062.939	0.25	58.85	71.7	185.4	0.16	0.022
BE112872	328529.28	5370641.26		53.45	51.12	248.9	0.01	
BE57167	328373.65	5370969.972	0	36.2	23.51	183.51	0.78	0
BE112447	328373.97	5370781.41	0	43.33	47.29	551.6	0.15	0
BE02663	328424.35	5370712.416	0.18	43	52.3	216.3	0.35	0.118
BE112872	328529.28	5370641.26		53.45	51.12	248.9	0.01	
6104371	328430.95	5370635.836	0	17.23	37.22	224.2	0.03	0
BE83647	328445.29	5370542.089		74.84	23.15	203.6	0	0.07
BE83594	328317.68	5370721.567	0.04	65.3	83.2	179.9	0.087	0.036
BE47431	328215.86	5370712.066	0.18	178	70.8	177.3	0.39	0.05
BE47430	328237.53	5370815.313	0.33	57.94	39.71	213.7	0.03	0.05
BE47437	328238.59	5370879.383	0.84	19.38	18.38	281.5	0	0
BE112868	327458.65	5369483.29	0.71	10.06	7.1	456.8	0.06	0.02
BE112867	327403.33	5369510.391	1.54	12.52	16.46	334.4	1.03	0.94
BE112809	327336.09	5369510.933	0	136.98	200.36	125.8	0.05	0.02
BE112623	327455.40	5369507.929	0.16	1.74	3.46	141.76	0.13	0
BE57123	338698.74	5374385.152	0.3	2.1	4.3	79.87	5.2	0
BE136206	338703.53	5374954.753	0.06	22.45	19.34	248.3	0.5	6.14
BE112859	331252.16	5370445.914	0.36	26.77	80.3	440.6	1	0.43
BE57079	328733.16	5372161.037	1.85	7.8	167.1	303.8	0.11	0.21
BE57075	328675.36	5372233.858	0.129	156	319	321.8	6.4	0.33
BE83799	327562.17	5373345.151	0	21	1.4	110	2.7	0
BE170209	325459.20	5373777.717	0.063	7.82	6.97	236	0.007	0.313
BE47415	324006.24	5373294.065	0.06	2.85	7.1	163	3.8	0
BE32116	323617.67	5373699.015	0.14	64.32	1.28	218.7	0.01	
BE112915	323146.58	5373906.698		10.79	3.66	524.6	5.49	3.09
BE112048	321411.39	5374410.737	0	2.07	1.91	172.1	0.05	0
BE83884	320797.97	5374576.471	0.185	39.6	33.5	246.8	1.43	0.17
BE170068	332899.87	5370749.961	0	20.6	51.2	264.4	0.01	0.12
BE170688	332898.90	5370666.574	0	4.62	2.7	97.4	0.03	0.06
BE170170	332811.46	5370667.35	0.2	52.88	240	667.6	0.02	0.06
BE246102	332807.34	5370744.801						
6104925	333002.94	5370646.231	0.16	24.42	1.67	151.2	0.02	0.02
6104925	332705.51	5370669.134	0.16	24.42	1.67	151.2	0.02	0.02
BE246116	332711.67	5370752.264						
BE136128	332319.02	5371407.591	3.2	51.74	29.17	40.02	0	0.15
BE197588	331417.44	5367746.411						
BE246140	330285.77	5367801.747	2	517	167	197	0.462	0.0875

Table F-3
Groundwater Chemistry

WELL ID	X	Y	NITRATE	SODIUM	CHLORIDE	HARDNESS	IRON	MANGANENSE
			10	20	250	80	0.3	0.05
BE57124	331138.53	5367785.322	0	68.7	198	979.7	0.7	0
BE83557	330962.93	5367782.241	0.26	3.59	10.1	199.8	0.6	0.029
BE244183	329055.23	5375827.956						
BE32274	329503.88	5371327.379	0.23	112.3	321.5	558.8	0.33	0.57
BE197608	328125.40	5371397.509	0.06	67.5	131	184	26.6	0.91
6104825	327489.39	5371062.312	3.9	144.4	221.2	491.5	3.16	0
BE136696	327046.57	5371122.039		24.31	2.18	224.7		0.01
BE47323	326521.92	5371175.336	0	6.75	1.52	298.36	1.33	0
BE83641	326043.39	5371397.337	0.079	4.9	13.5	198	0.472	0.3
BE112822	324723.30	5371162.48	1.55	36.7	100.6	159.5	0.005	0
BE112968	321727.07	5371162.461	1.94	3.82	18.2	480.2	0.01	0.03
BE57147	321400.19	5371477.772	0	4.93	4.65	372.2	0.54	0
BE136873	321811.88	5371205.566	0	1089	1.96	235.5	0	0.12
BE136137	321258.40	5371468.77	0	29.02	26.68	171.5	0.01	0.05
BE83720	323068.81	5369320.471	0.03	6.78	7.29	182	8.82	0.735
BE170231	322884.35	5368895.274	0.38	77.15	138.8	211.5		0.04
BE83720	323068.81	5369320.471	0.3	28.7	17.5	236.69	0.43	0
BE83719	323040.60	5369391.959	0	36.59	30.68	204.63	0.47	0
BE83969	324877.55	5353246.601	0.78	202.78	92.2	243.17	2.31	0
BE47383	324742.66	5353265.054	3.5	9.58	8	281.1	0.2	0.082
BE112002	331362.02	5370663.274	0.005	31.1	10.7	219.8	0.21	0.15
BE83794	331557.79	5371127.581	0.6	13.5	4.1	121.6	1.03	0
BE170240	331321.14	5372303.968		42.09	181.28	38.4	0.07	0.06
BE224069	331444.38	5372938.187	3.2	7.8	50.4	245	0.0119	0.00156
BE83673	331056.90	5373445.288	0.345	14	26		2.5	0.13
BE112900	331480.04	5375593.983	1.37	5.52	6.1	105.8	0.01	0
BE112900	331480.04	5375593.983	0.38	8.19	4	107.7	0.05	0.04
BE83718	331312.46	5375802.101	0	3.14	2.56	165.5	0.04	0
BE112619	326047.10	5365152.315	0	12.16	28.2	191.6	1.48	0
BE112618	326021.47	5365288.411	0.145	47.3	239	371	14	0.371
BE170740	326036.12	5365015.828						
BE170739	326036.12	5364997.976	0.06	25.8	43.2	167	13.33	0.176
BE170739	326036.12	5364997.976	0.06	25.8	43.2	167	13.33	0.176
6104511	333112.91	5370615.563	0.04	10.99	24.94	178	0	0.15
BE57108	332977.68	5371007.913	0.22	25.5	31.5	204	0.511	0.056
BE112801	332962.71	5370996.941						
BE47526	333123.94	5371196.792						
BE136231	333114.94	5371758.473						
BE83879	332912.33	5375664.246	0.43	30.02	18.66	157.5	0.06	0.08
6104925	333002.94	5370646.231	1.24	23.41	3.27	102.31	1.5	0
6104925	332705.51	5370669.134	1.24	23.41	3.27	102.31	1.5	0
BE83880	332915.65	5375922.855	0.001	18.6	2.1	171.8	0.99	0.47
BE83879	332912.33	5375664.246	0.005	20.9	2.9	152.9	0.48	0.087
BE197530	326036.98	5368105.457						
BE197529	326145.04	5368102.393						
BE83683	320606.36	5368988.29						
BE83577	326957.73	5365056.488	1.8	2.9	7.1	197	0.18	
BE170600	327227.60	5368213.818	0.03	294	815	695	5.5	0.193
BE57137	324925.46	5367886.904						
BE57137	324910.52	5368157.827						
BE83970	324400.34	5364320.448	0.45	40.6	28.7	175.49	0.65	0
6104771	324435.01	5364503.645	0	18.86	2.88	336.39	1.93	0
BE136141	324539.05	5364521.423	0	200.17	377.3	790.9	0	0.25
BE112814	325324.19	5376171.78	0.06	12.48	1.76	162.5	0	0.02
BE83711	325259.49	5376180.959	0.2	4.6	3.56	164	0.05	0
BE197464	326218.96	5368375.033						
BE83887	326228.84	5368223.204	0.188	12.1	8.4	177.1	2.04	1.68
BE83887	326228.84	5368223.204						
BE47546	326219.54	5368698.644	0	1170.8	2022	7067.2	0.16	0
BE47375	329289.25	5372225.198	0.05	3.71	7.3	246.2	0.17	0.2
BE242467	325000.88	5353338.811	0.041	28.9	0.02	206	3.08	0.098
BE170822	322302.35	5372900.978	0	3.87	1.67	117.5	0.02	0.02
6102998	334877.39	5371675.708		87.3	94	185.9	0.012	0.013
6104845	329075.26	5356241.912	0	28.72	5.65	128.59	0.3	0

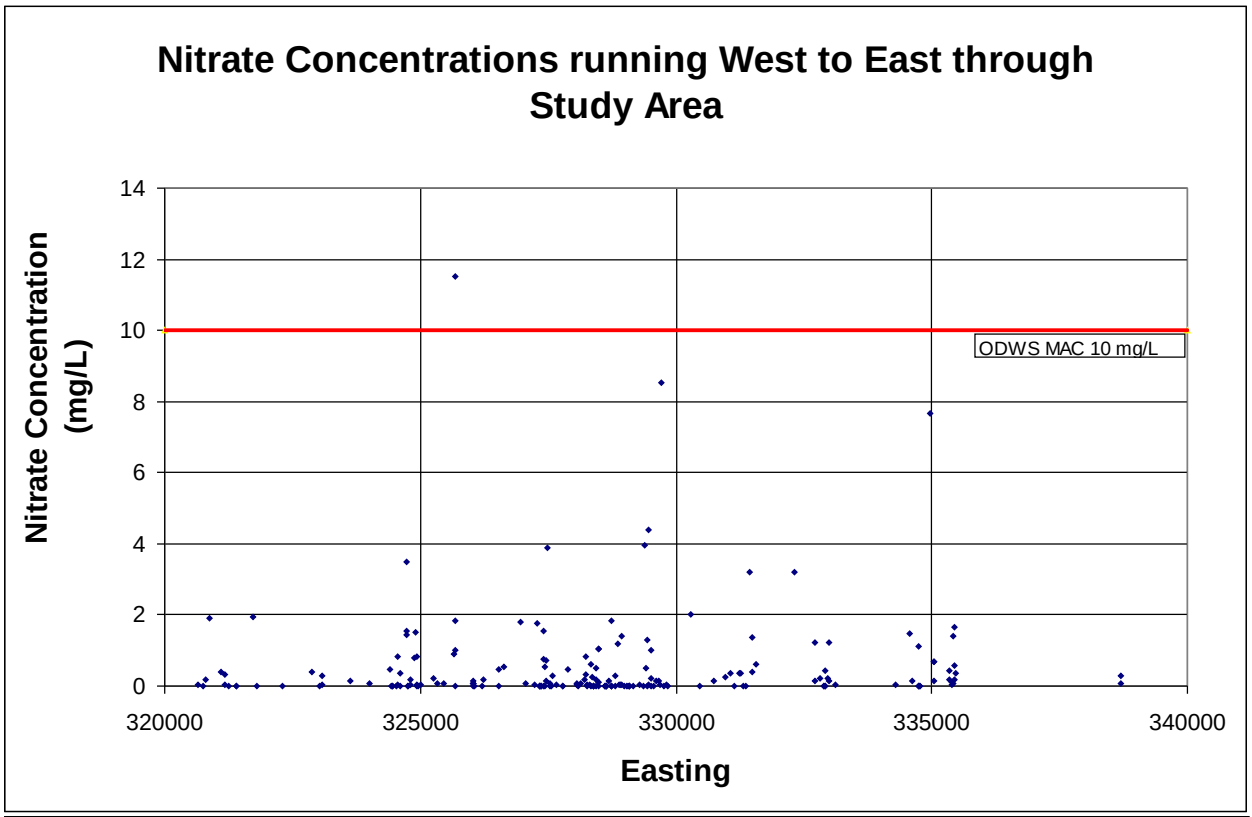
Table F-3
Groundwater Chemistry

WELL ID	X	Y	NITRATE	SODIUM	CHLORIDE	HARDNESS	IRON	MANGANENSE
			10	**20**	**250**	**80**	**0.3**	**0.05**
BE119482	329051.01	5355807.277	0	59.3	20.76	16.81	0.02	0.09
BE249074	324558.05	5364061.615	0.03	44.6	168	310	0.256	0.0367
BE47505	324613.73	5364059.014	0.345	5.82	24.7	78.8	0.224	0.008
BE136264	324606.33	5364179.843	0	64.84	209.5	271.8	0	0.03
BE112018	329408.76	5374578.337	0.51	2.24	1.28	165.91	0.08	0
BE112096	329757.88	5374340.015	0	11.55	1.86	231.9	0.45	0
BE244194	329695.52	5374380.225	0.03	11.3	49	213	0.216	0.216
BE136872	330735.74	5374399.703	0.15	2.81	8.65	139.8	0.03	0.26
BE83541	329925.51	5366524.884		95.28	222.73	286	0.01	0.04
BE83600	330134.11	5366512.259		108.4	17.93	170	1.424	0.023
BE136831	329553.54	5370297.003	0	33.2	64.82	193.2	0	0.05
BE136564	329391.59	5370193.096	3.95	140.87	537.16	831.9		0.28
BE112006	329603.16	5370205.441	0.15	59.72	4.75	144.4	0.68	
BE112006	329668.57	5370199.231	0.15	59.72	4.75	144.4	0.68	
BE170802	324925.95	5375568.878	0.82	25.18	3.75	80.8	0.04	0
BE170802	324925.95	5375568.878	0	26.39	2.83	90.9	0.02	3
BE136886	324806.17	5373987.998		13.25	7.74	232.2	0.01	0.19
6102187	324733.96	5373503.677	1.43	22.94	178.23	80.7	0.05	0.06
6103086	324760.86	5372937.014	0	6.03	37.14	346.9	0.18	0.05
BE136565	324552.77	5372836.688	0.83	19.69	22.46	202.1	0.01	0.02
BE83788	324446.96	5370697.817	0	4.9	1.72	169.14	0.18	0
6103459	324483.53	5371760.78						
6104841	324760.08	5368185.308	0	902.1	749.3	8284.5	15.02	0
BE112955	324942.33	5364716.618	0.03	60.7	128	157	3.98	0.073
BE232473	324804.48	5364717.199						
BE136814	324906.07	5364164.526	1.51	4.17	0	52	0.032	0.0048
BE136814	324906.07	5364164.526						
BE83769	324462.88	5370423.2	0	6.77	3.66	238.62	0.32	0
BE197431	324799.47	5370036.066	0.03	11.4	104	367	0.013	0.05
BE236923	334573.58	5375402.959						
BE224061	334296.62	5370469.15	0.02	4.35	16.5	273	22.9	0.549
BE170790	321099.14	5365203.438	0.38	2.85	2.15	545	0.877	0.084
BE170071	321188.71	5365143.361	0.03	19.1	136	457	2.13	0.075
BE244189	322204.66	5365110.105						
BE244189	322204.66	5365110.105						
BE112922	324952.36	5365250.576	0	5.58	1.92	220	0.03	0.06
BE136132	325679.53	5365419.201	11.5	17.4	28.2	224	0.005	0.0008
BE136132	325679.53	5365419.201	1.85	3.78	12.5	204	0.176	0.0362
BE247601	324795.91	5365415.345	0.17	181	622	711	0.427	0.0952
6104862	327427.58	5365350.259	0.53	7.39	1.33	194.1	0.05	0
BE136391	327536.23	5365166.196	0	55.37	156.91	171.2	0	0.03
BE170232	320885.22	5365199.068		45.32	343.34	528.7	0.02	0.07
BE170232	320885.22	5365199.068	1.91	39.86	187.88	387.4	0.06	0.05
BE224060	328050.50	5365358.03	0.06	367	1090	905	51.6	0.578
BE192437	328259.88	5365357.928	0.04	461	1410	1040	2.32	0.29
BE170657	328335.72	5365391.055	0	653.5	1713.5	4840.2	0.37	0.03
BE83640	328812.39	5365186.618	0.005	32.4	42	206.2	1.43	0.025
BE83640	328812.39	5365186.618	0.29	850	1409.1	705.2	0.72	0.48
BE136397	328867.56	5365331.14	1.19	117.24	433.8	638.5		
BE136398	328739.39	5365417.817	0	35.56	36.91	54.5	0	0.04
BE136398	328633.83	5365481.51	0	35.56	36.91	54.5	0	0.04
BE136398	328600.79	5365423.808	0	35.56	36.91	54.5	0	0.04
BE112747	327064.10	5365253.09	0.082	21.65	12.9	341.8	0.02	0.251
BE112422	321168.56	5365146.059	0.32	190.9	89.36	566.5	0.02	0
BE112618	326021.47	5365288.411	0	11.86	65.1	391.3	0.34	0
BE136741	327437.51	5365250.198	0	145.3	262.02	207.3	0.02	0.06
BE136743	327402.27	5365249.097	0	148.25	260.46	414.6	0	0.06
BE136742	327352.34	5365250.932	0	147.57	249.2	363.2	0.01	0.08
BE136556	330472.61	5368053.189	0	13.69	33.36	172	0.02	0.02
BE221489	327591.18	5369530.436	0.3	6.43	9.9	180	0.0682	0.0615
BE246122	327670.80	5369632.648	0.03	105	37.2	235	0.0199	
BE246122	327670.80	5369632.648						
BE136700	327773.82	5369628.741	0	12.85	55.96	6.3	0	0
BE136700	327773.82	5369628.741	0	30.27	32.77	266.7	0	0.01

Table F-3
Groundwater Chemistry

WELL ID	X	Y	NITRATE	SODIUM	CHLORIDE	HARDNESS	IRON	MANGANENSE
			10	20	250	80	0.3	0.05
BE83646	327878.05	5369641.601	0.48	3.99	26.4	288.9	0.059	0.102
BE47417	327860.26	5369471.025						
BE17037	328093.34	5369594.766	0	24.99	23.75	185.6	0.17	0.2
BE47682	328264.31	5369484.637	0.005	128.3	307	449.6	0.178	0.102
BE136707	328976.22	5369562.66	0	65.86	139.15	235.1	0.2	0.07
BE136708	329036.26	5369561.7	0	23.16	115.13	5.5	0.06	0.05
BE136709	329095.81	5369561.7	0	48.09	143.39	287.9	0.24	0.02
BE112613	329095.30	5369436.64	0	34.88	130.2	376.8	0	0
6103284	331249.62	5370070.415	0.35	286	410.5	335.1	2.5	0.042
BE170131	329170.21	5369562.177	0	62.75	251.4	312.9	0.02	0.02
BE170132	329370.72	5369555.915	0	120.19	425.75	638.3	0.01	0.13
BE170133	329430.24	5369568.44	1.29	63.52	239.63	412.7		0.24
BE170134	329462.83	5369583.089	4.38	44.76	124.83	139.2		0.07
BE170135	329500.43	5369586.22	1	40.64	107.05	282.5		0.05
BE170136	329504.60	5369532.99	0	58.85	221.27	292.9	0.01	0.15
BE136147	327374.14	5369891.504		71.26	35.14	71.26	0.03	0.02
BE136148	327528.64	5369897.131		182.03	251.18	378.3	0.01	0.08
BE136146	327475.12	5369919.731		159.22	300.24	223.46	0.01	0.11
BE136103	327545.25	5369916.878	0.06	96.59	22.02	457.4	0.03	0.06
BE136149	327406.98	5369919.544	0.75	101.64	139.3	106.2	0.02	0.02
BE136043	328496.40	5365510.207	1.06	49.13	73.03	129.3	0.07	0.04
BE136398	328739.39	5365417.817	0	35.56	36.91	54.5	0	0.04
BE136398	328633.83	5365481.51	0	35.56	36.91	54.5	0	0.04
BE136398	328600.79	5365423.808	0	35.56	36.91	54.5	0	0.04
BE136398	328739.39	5365417.817	0	35.56	36.91	54.5	0	0.04
BE136398	328633.83	5365481.51	0	35.56	36.91	54.5	0	0.04
BE136398	328600.79	5365423.808	0	35.56	36.91	54.5	0	0.04
BE136045	328475.04	5365555.484	0	107.54	236.89	368.7	0.02	0.02
BE136043	328496.40	5365510.207	1.06	49.13	73.03	129.3	0.07	0.04
BE57151	326531.55	5373963.145	0.48	3.99	26.4	228.9	0.059	0.102
BE112810	320755.83	5372650.19	0	3.12	8.66	267.7	0	0.01
BE197564	320657.59	5367066.729	0.03	33.5	50.7	137	13.7	0.218
BE83683	320606.36	5368988.29						
BE119484	328941.79	5369411.644	1.41	58.35	157.59	289.4		0.37
BE170742	328919.13	5369694.562	0.03	75.4	241	361	2.91	0.172
BE170744	328886.83	5369691.18	0.03	130	408	569	0.206	0.085
BE170743	328928.73	5369680.407	0.03	154	535	614	1.24	0.116
BE112803	325683.55	5368644.958	0	21.98	54.32	221.2	0.05	0.8
BE83747	325672.65	5368427.644	1	18.7	20.9	298.9	0	0
BE83735	325657.17	5368496.7	0.9	18.4	20.8	296.9	0	0
6104895	328341.86	5372173.722	0.6	11.57	23.02	279.49	0.61	0
BE112437	328385.52	5372096.719	0	6.71	20.71	241	0.34	0
BE17070	328475.58	5372116.45	0.116	53.3	71.5	251.6	3.4	0.113
BE83797	328433.50	5371921.589	0.5	15	26	190	0.1	0.07
BE112934	326950.64	5371308.929		5.78	3.41	360.3	0.02	0.22
BE112933	326622.37	5371326.305		3.45	2.06	284.3	0.04	0.05
BE112932	326624.54	5371351.266		4.02	2.93	247.5	0.01	0.08
6105261	326624.92	5371370.887	0.53	69	60.45	232.6	0.01	0.03
BE47434	328054.25	5364880.33	0.04	63.98	18.2	52.6	0.01	0.06
BE170660	333586.04	5370285.494						
BE244219	333697.01	5370275.367						
6104844	335045.91	5370260.247	0.68	33.76	6.9	154.2	0.22	0
BE83786	334980.46	5370297.105	7.66	13.59	14.95	282.93	0.91	0
6104844	335045.91	5370260.247	0.68	33.76	6.9	154.2	0.22	0
BE112435	335045.36	5370286.414	0.15	33.97	5.8	162.9	0.15	0
BE136433	327350.58	5365132.822	0	175.09	276.06	438.7	0	0.11
BE136435	327351.98	5365148.72	0	160.17	202.11	401.2	0.05	0.12
BE197580	327247.04	5364579.149						
BE197775	327281.33	5364957.509	1.76	14.1	92	238	24.7	0.133
BE136424	327346.39	5364855.101	0	243.3	466.8	342.9	0	0.06
BE136432	327348.69	5364921.836						
BE136425	327345.21	5365105.618	0	565.92	839.96	301.2	0.55	0.06

Figure F-4


Nitrate Concentrations running West to East through Study Area
Nitrate Concentration (mg/L)
14
12
10
8
6
4
2
0
ODWS MAC 10 mg/L
320000
325000
330000
335000
340000
Easting

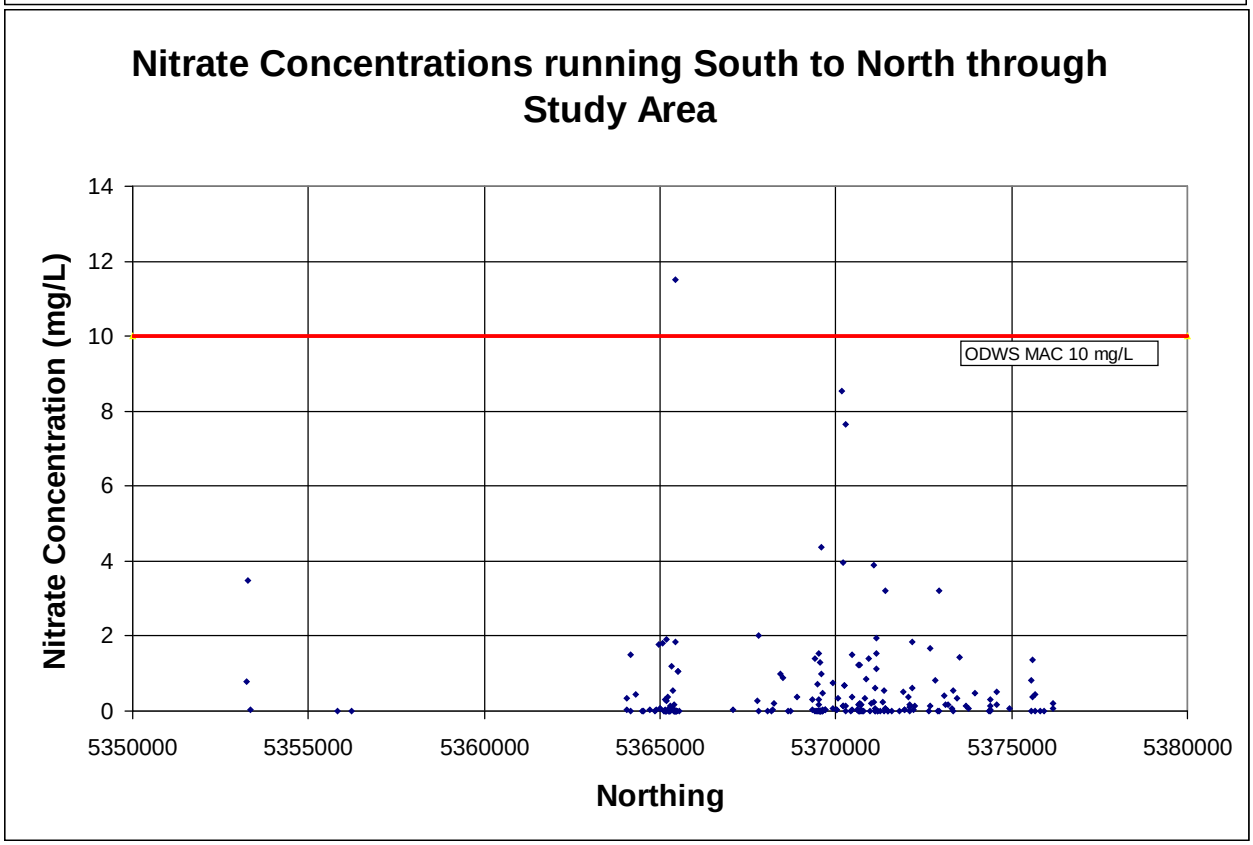
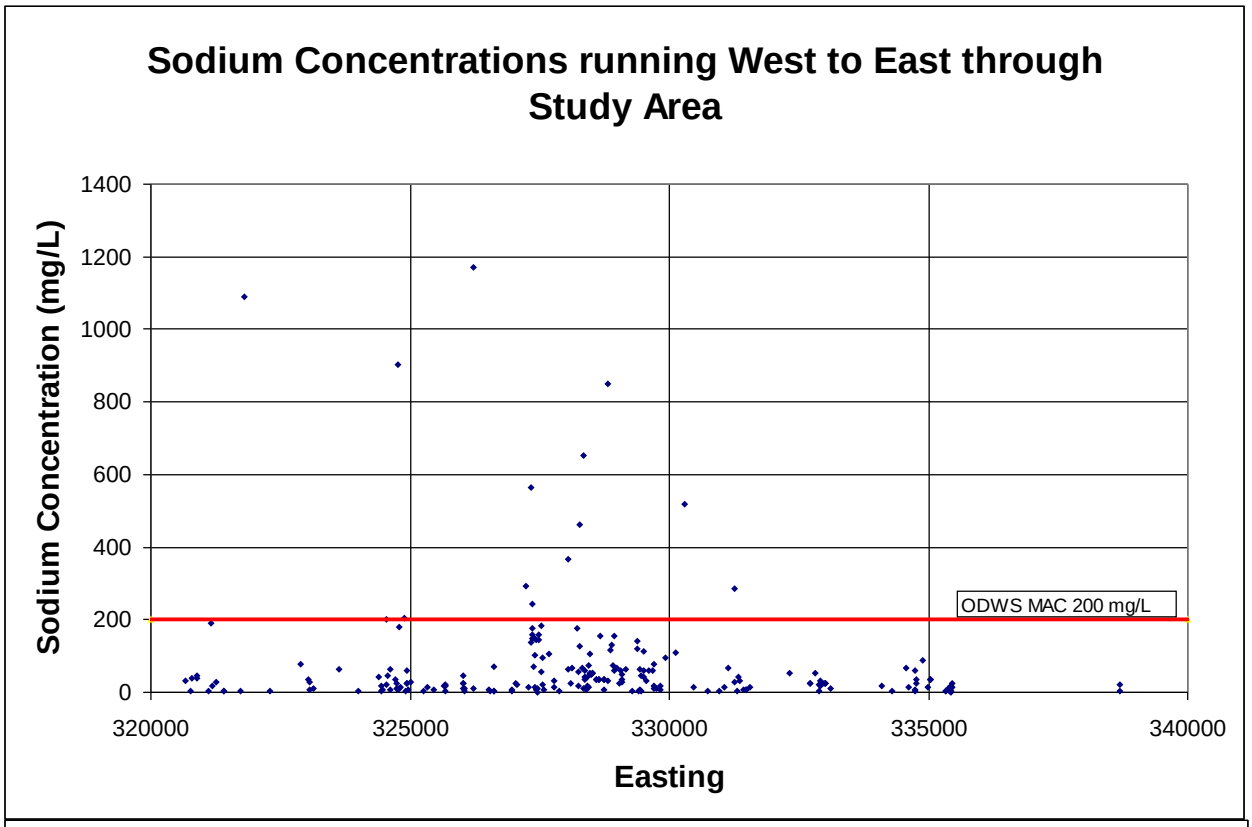

Nitrate Concentrations running South to North through Study Area
Nitrate Concentration (mg/L)
14
12
10
8
6
4
2
0
ODWS MAC 10 mg/L
5350000
5355000
5360000
5365000
5370000
5375000
5380000
Northing

Figure F-5


Sodium Concentrations running West to East through Study Area
Sodium Concentration (mg/L)
1400
1200
1000
800
600
400
200
0
ODWS MAC 200 mg/L
320000
325000
330000
335000
340000
Easting

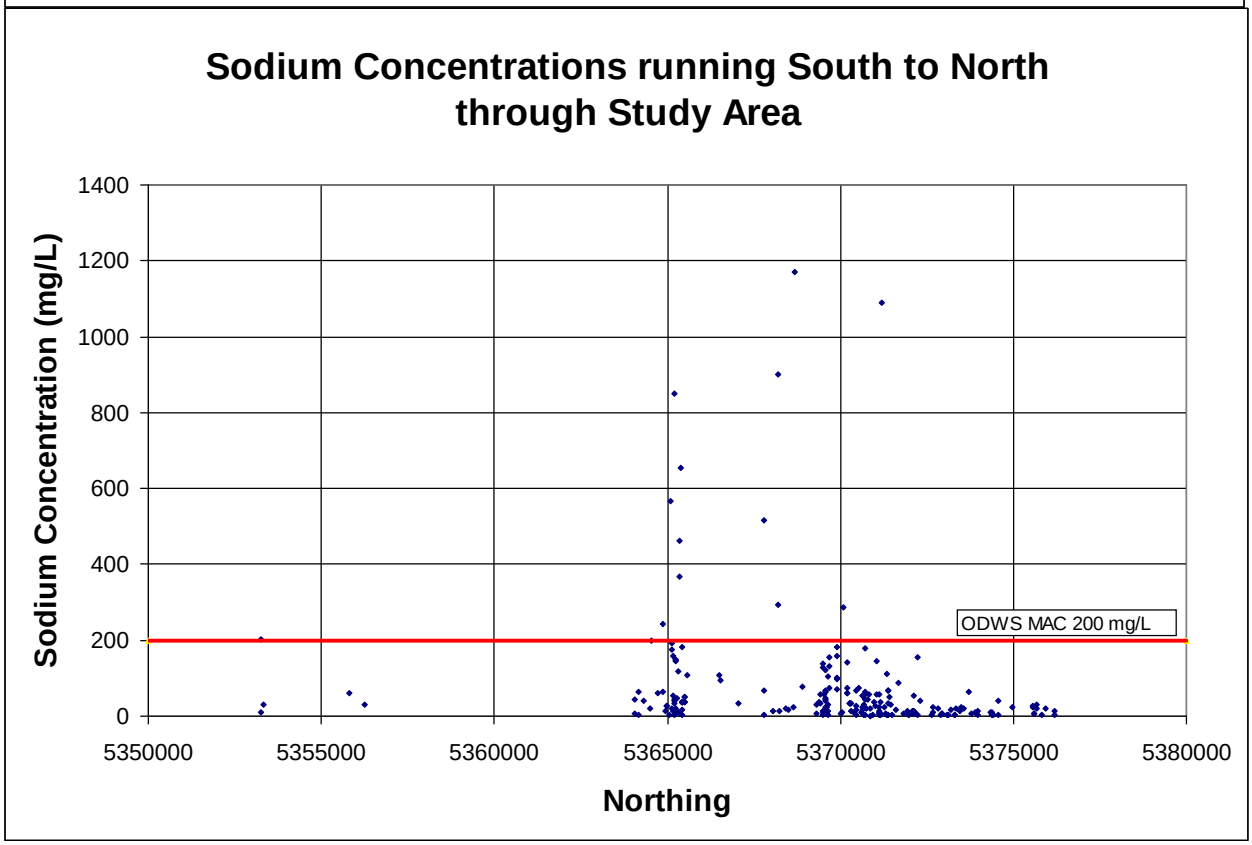
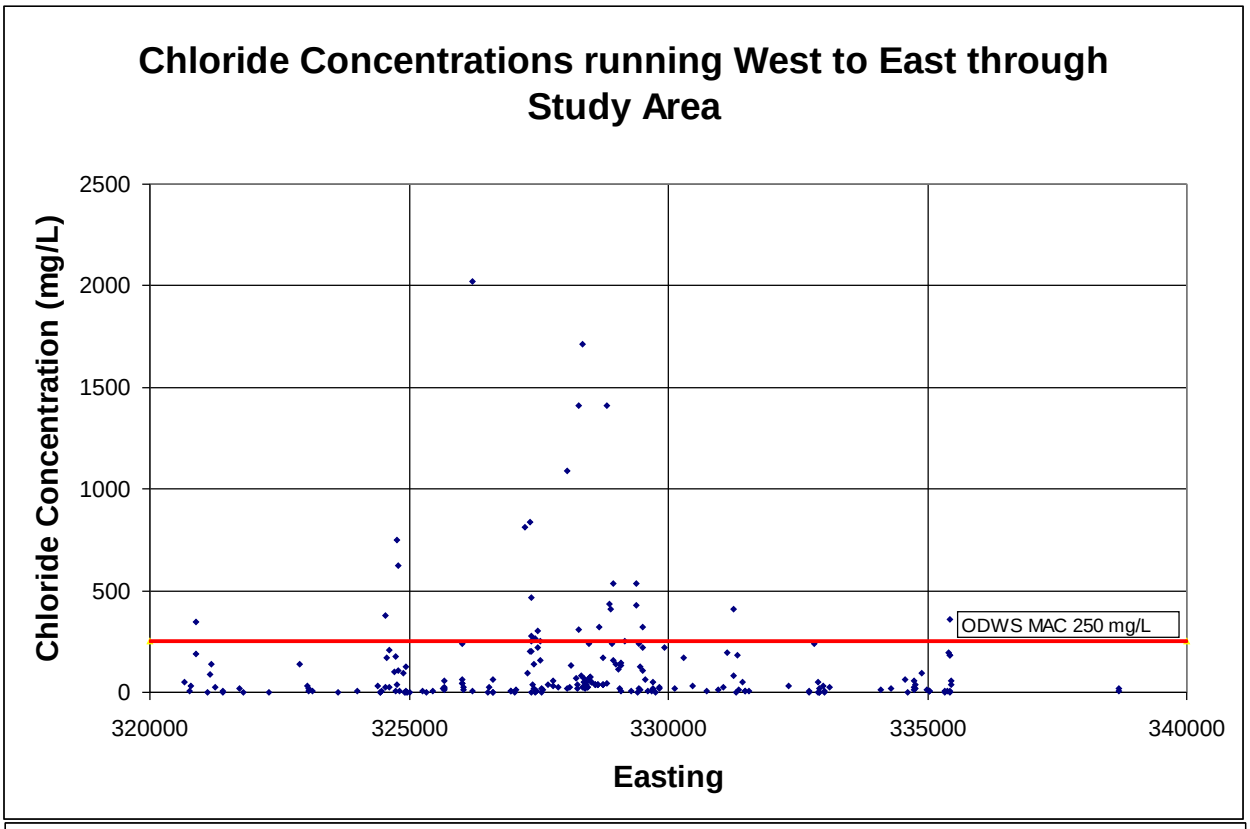

Sodium Concentrations running South to North through Study Area
Sodium Concentration (mg/L)
1400
1200
1000
800
600
400
200
0
ODWS MAC 200 mg/L
5350000
5355000
5360000
5365000
5370000
5375000
5380000
Northing

Figure F-6


Chloride Concentrations running West to East through Study Area
Chloride Concentration (mg/L)
2500
2000
1500
1000
500
0
320000
325000
330000
335000
340000
Easting
ODWS MAC 250 mg/L

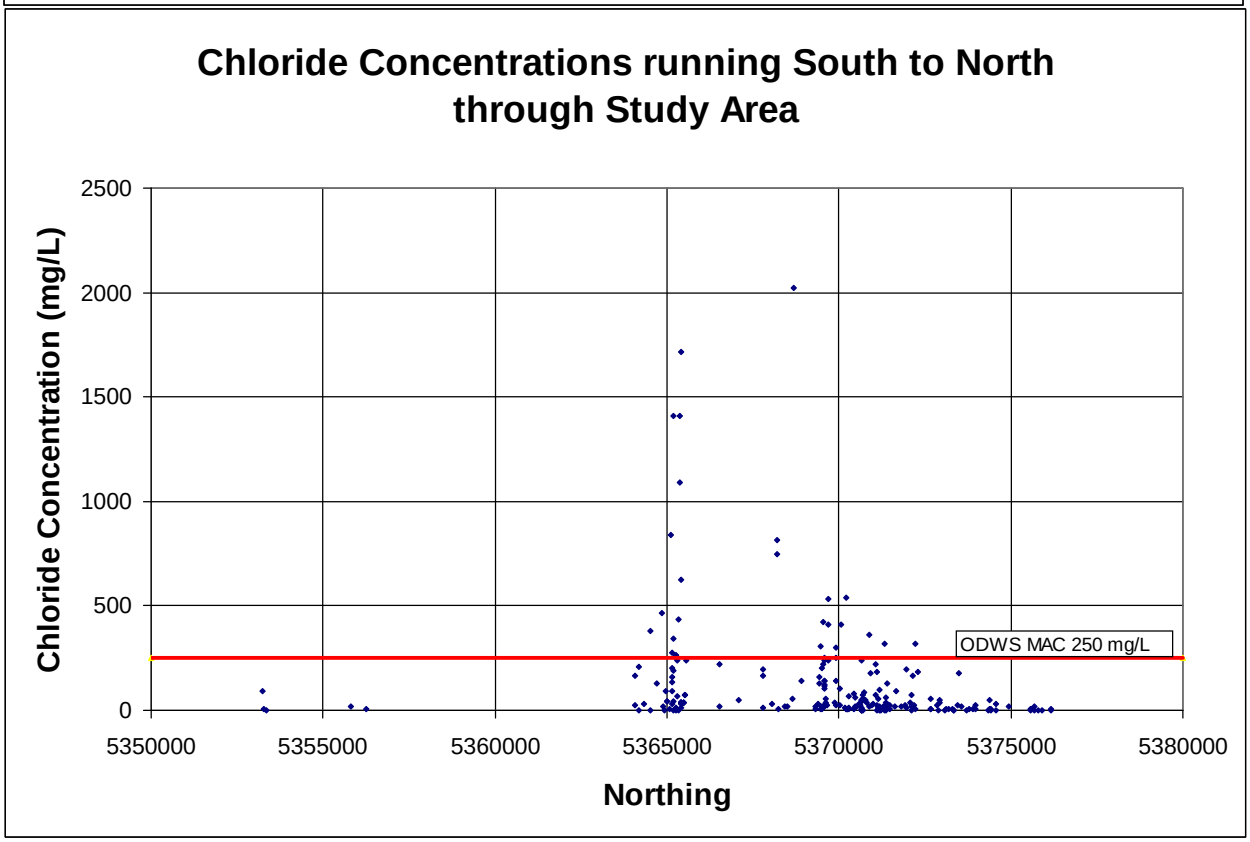
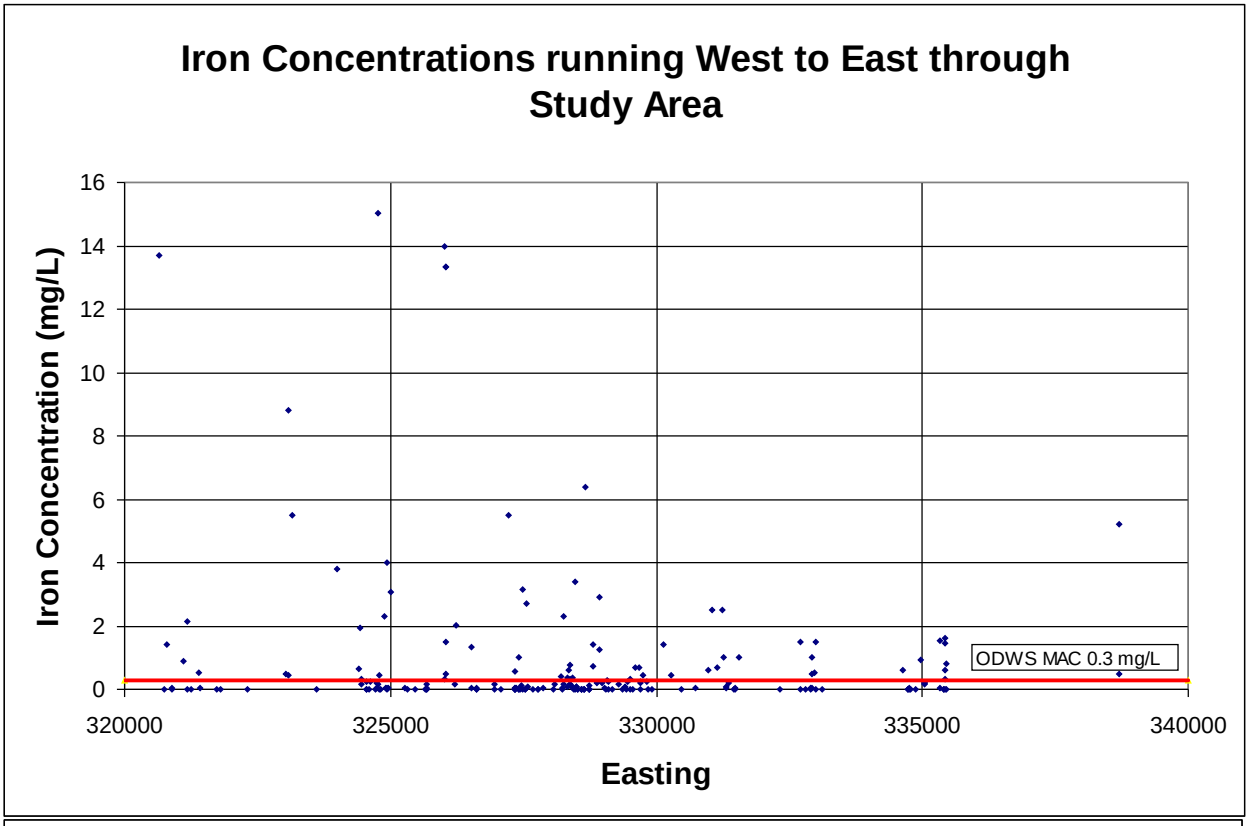

Chloride Concentrations running South to North through Study Area
Chloride Concentration (mg/L)
2500
2000
1500
1000
500
0
5350000
5355000
5360000
5365000
5370000
5375000
5380000
Northing
ODWS MAC 250 mg/L

Figure F-7


Iron Concentrations running West to East through Study Area
Iron Concentration (mg/L)
16
14
12
10
8
6
4
2
0
320000
325000
330000
335000
340000
Easting
ODWS MAC 0.3 mg/L

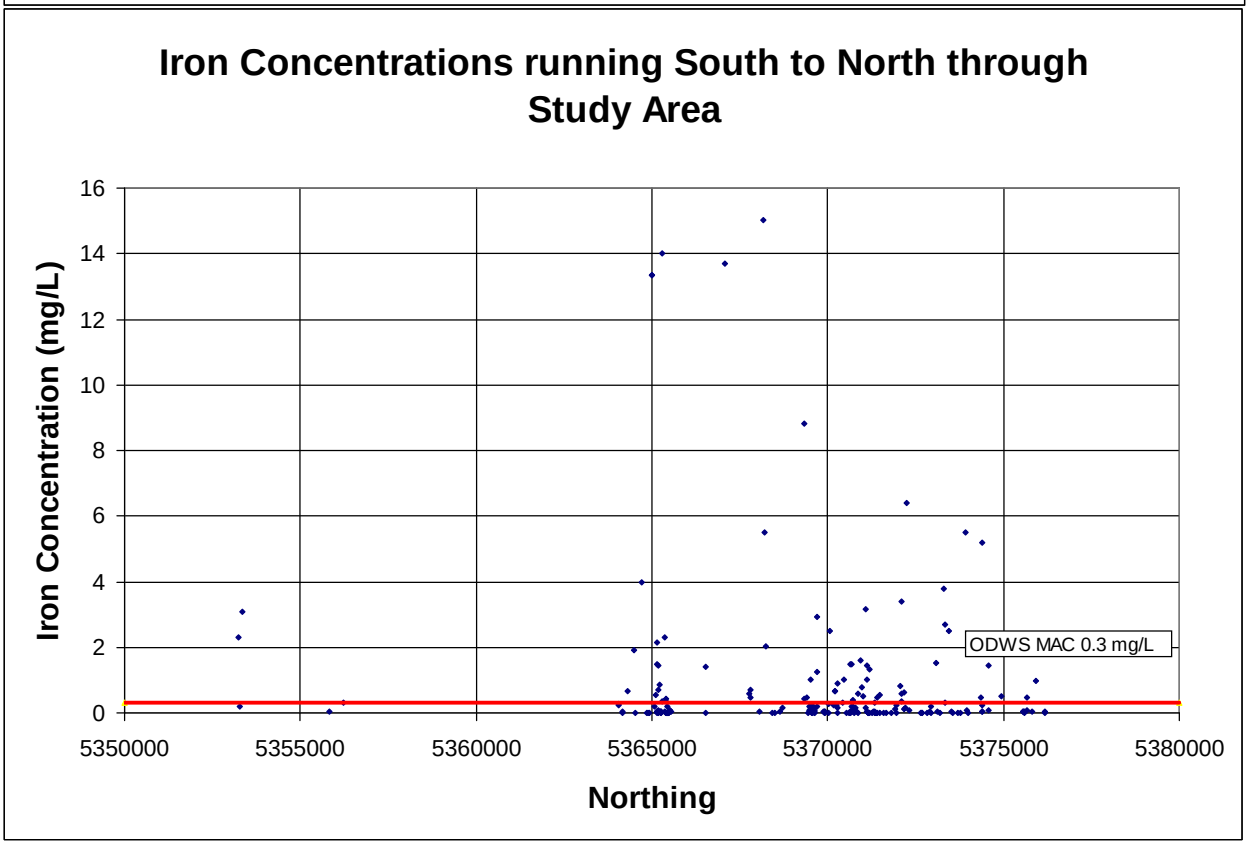
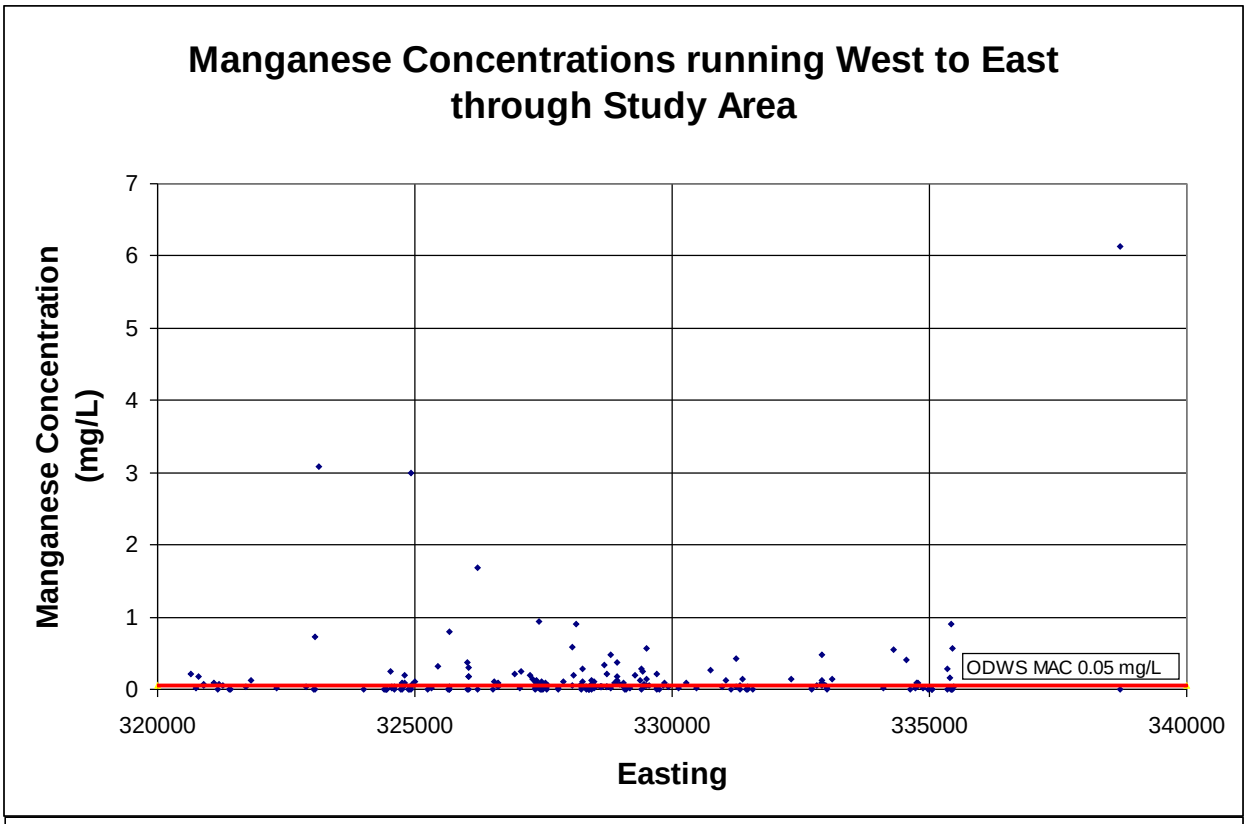

Iron Concentrations running South to North through Study Area
Iron Concentration (mg/L)
16
14
12
10
8
6
4
2
0
5350000
5355000
5360000
5365000
5370000
5375000
5380000
Northing
ODWS MAC 0.3 mg/L

Figure F-8


Manganese Concentrations running West to East through Study Area
Manganese Concentration (mg/L)
7
6
5
4
3
2
1
0
320000
325000
330000
335000
340000
Easting
ODWS MAC 0.05 mg/L

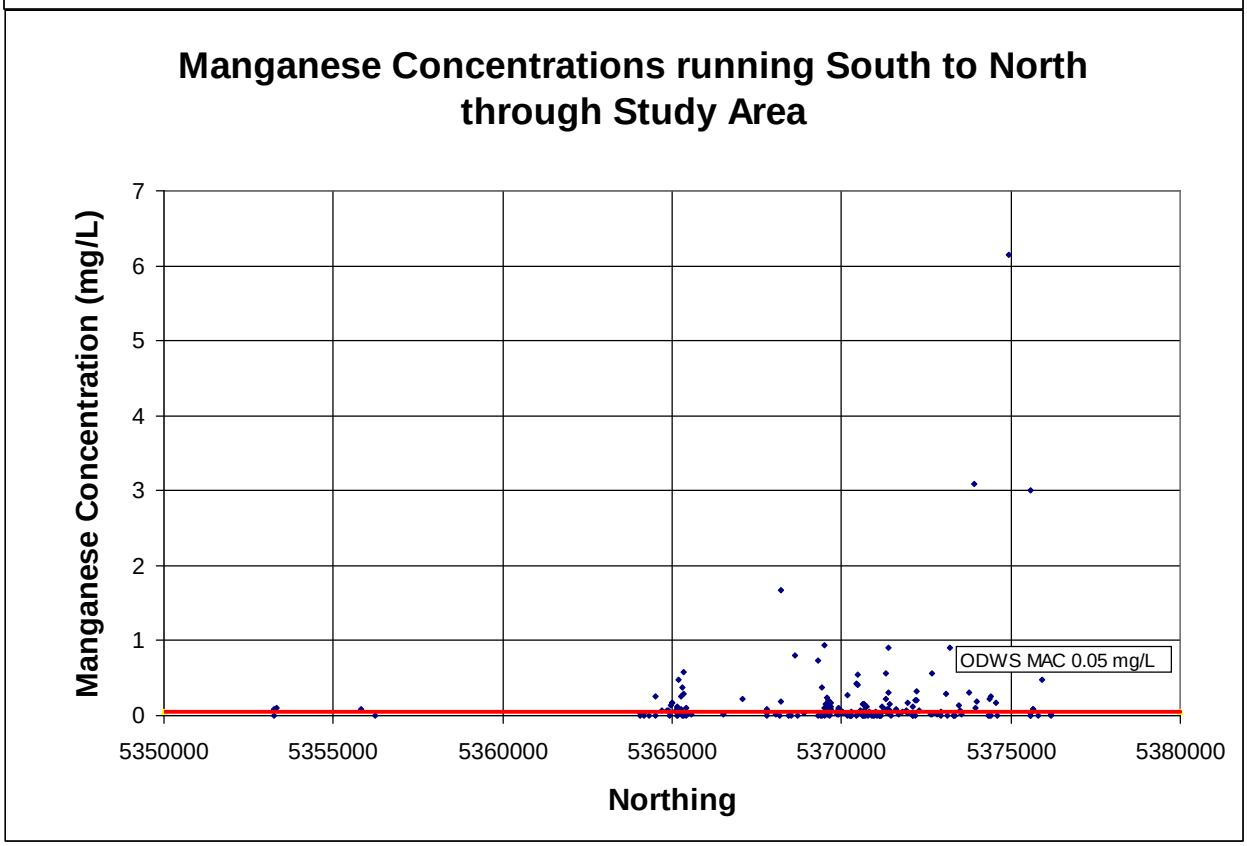
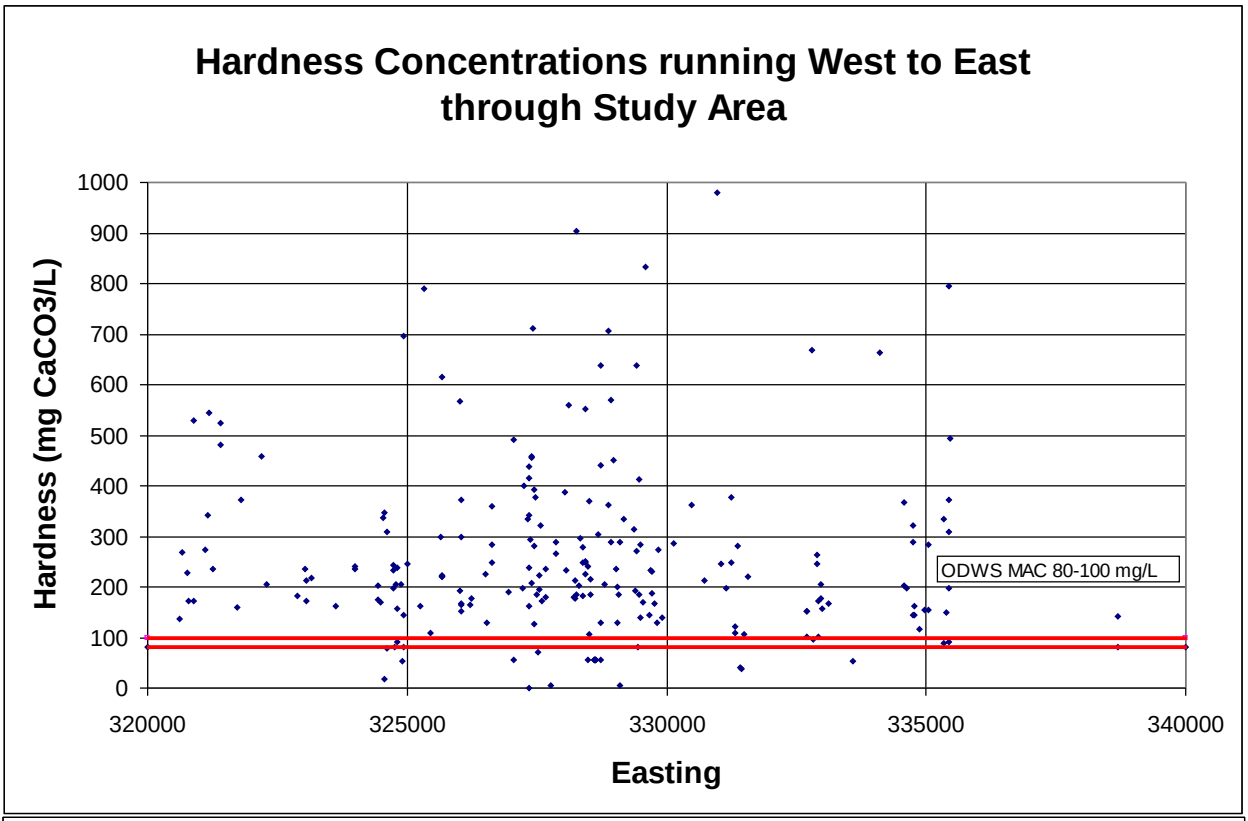

Manganese Concentrations running South to North through Study Area
Manganese Concentration (mg/L)
7
6
5
4
3
2
1
0
5350000
5355000
5360000
5365000
5370000
5375000
5380000
Northing
ODWS MAC 0.05 mg/L

Figure F-9


Hardness Concentrations running West to East through Study Area
Hardness (mg CaCO3/L)
1000
900
800
700
600
500
400
300
200
100
0
320000
325000
330000
335000
340000
Easting
ODWS MAC 80-100 mg/L

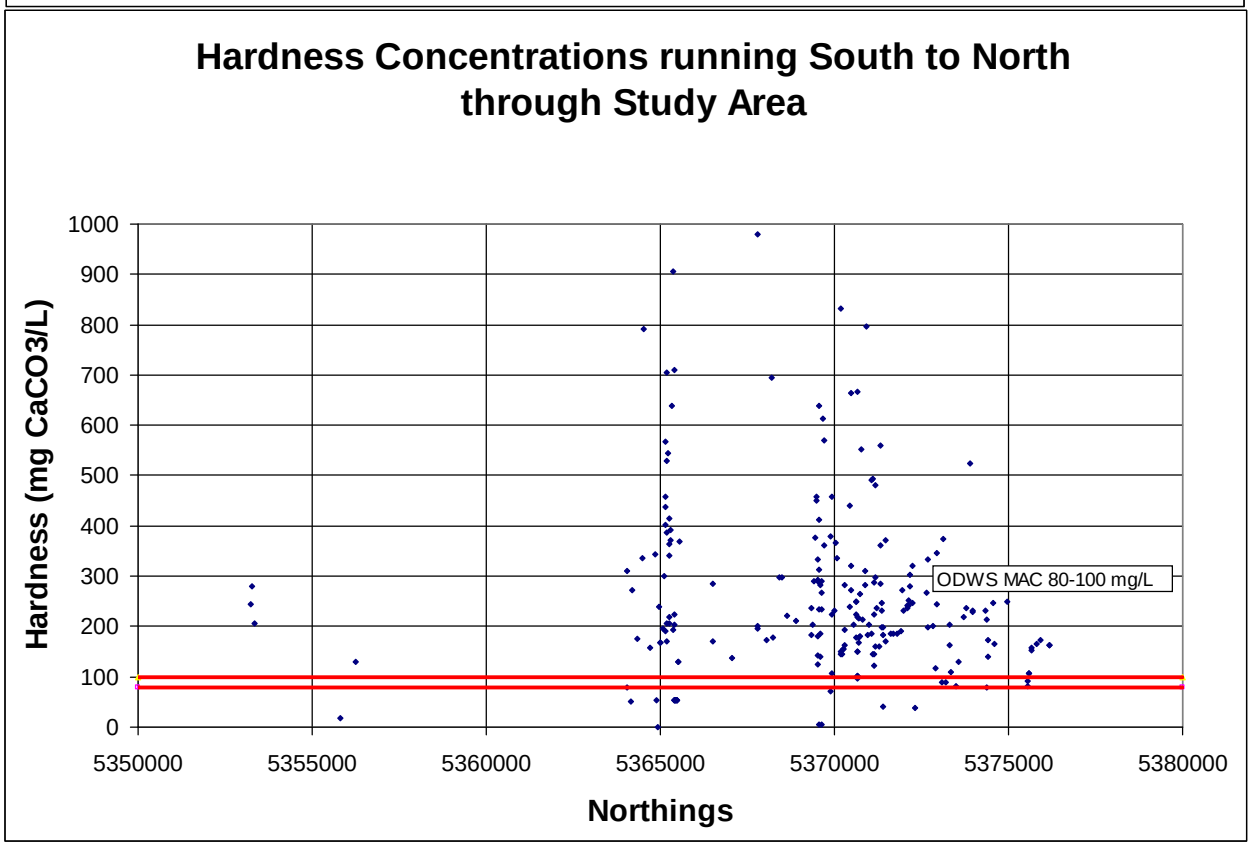

Hardness Concentrations running South to North through Study Area
Hardness (mg CaCO3/L)
1000
900
800
700
600
500
400
300
200
100
0
5350000
5355000
5360000
5365000
5370000
5375000
5380000
Northings
ODWS MAC 80-100 mg/L

Table F-10
City Well Data Summary - Groundwater Quality Assessment

Groundwater Quality Assessment City of Thunder Bay Data		
Total # Wells in Data Set	**652**	
Total # Wells with UTM Coordinates	**253**	
Total # Wells with Pumping Data	312	47.9%
Total # Wells with Chemistry Data	595	91.3%
Chemistry (253 wells in Data Set)		
Parameter	Number of Wells with Exceedences	Percentage of Total Wells Tested
Nitrate	1	0.4%
Sodium	135	53.4%
Chloride	28	11.1%
Hardness	199	78.7%
Iron	76	30.0%
Manganese	96	37.9%
Wells (652 wells in Data Set)		
Drilled Wells	350	53.7%
Dug Wells	281	43.1%
Unknown	21	3.2%

BURNSIDE

Appendix G
Surface Water Assessment

Table G-1
Summary of Peak Flood Flows

Outlet #	Watercourse	Location	Drainage Area		Proctor & Redfern (1978, 1981)*****		Theil & Associates (1987)		Proctor & Redfern (1991)****	
			km^2	sq mi	m^3/s	cfs	m^3/s	cfs	m^3/s	cfs
	Kaministikwia River	at Lake Superior	58	22.42						
	Neebing River		216	83.40	105	3708	121**	4273**		
	Pennock Creek		44	17.03			22***	791***		
	McIntyre River		146	56.37	212	7487	161	5686		
	Current River									
		upstream gauge	111	43.00					2	62
		downstream gauge	492* 472	190* 182					7	252
	McVicar's Creek		48	18.46			157	5562		
	Mosquito Creek		30	11.74			123	4361		

* Gauging station was inoperational between 1986 and 1988. Station was moved upstream in 1988.
** Upstream of the Diversion
*** Value based on calculations which have been calibrated using three storms
**** Values based on historical streamflow data
***** Values based on a Regional Flood Frequency Analysis

Table G-2
Thornthwaite Method - Average Annual Potential Evapotranspiration
Thunder Bay A 48°22'N 89°19'W, 199 m

MONTH (1971-2000)	DAYS PER MONTH	MEAN TEMP	DAYLIGHT HOURS	HEAT INDEX	ETP	DAYLIGHT FACTOR	ETP. adj
		(deg C)			(mm)		(mm)
January	31	-14.8	9.0	0.0	0.0	0.8	0.0
February	28	-12.0	10.2	0.0	0.0	0.8	0.0
March	31	-5.5	12.3	0.0	0.0	1.1	0.0
April	30	2.9	14.1	0.4	18.3	1.2	21.5
May	31	9.5	15.1	2.6	53.2	1.3	69.1
June	30	14.0	16.0	4.8	75.4	1.3	100.5
July	31	17.6	15.5	6.7	92.6	1.3	123.8
August	31	16.6	14.3	6.2	87.9	1.2	108.0
September	30	11.0	12.5	3.3	60.7	1.0	63.3
October	31	5.0	11.0	1.0	29.8	0.9	28.3
November	30	-3.0	9.1	0.0	0.0	0.8	0.0
December	31	-11.6	8.4	0.0	0.0	0.7	0.0
Annual		2.5		25.0			515

Notes:
1) Mean temperature data from the Thunder Bay A Climate Station
2) Heat Index I = sum (T/5)^1.514, where T = mean monthly temp.
3) ETP = 16 (10(T/I))^a (mm), where I = mean annual Heat Index, and,
   a = 6.7E-07 x I^3 - 7.71E-05 x I^2 +1.79E-02 x I + 0.49
4) Daylight Factor = (d/30)x(h/12), where d = days in month, h = daylight duration on 15th day of month
5) Daylight Hours: Herzberg Institute of Astrophysics 2002
6) Data Source: Environment Canada Climate Normals (1971 to 2000)

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Appendix H
Contaminant Sources

Table H-1
Risks of Potential Contaminants Associated with Various Land Uses

Land Use Considerations \ Potential Contaminants	Acids	Bases	Chloride	Fluoride	Iron/Manganese (Fe/Mn)	Metals (except Fe & Mn)	Nitrate	Pathogens (Virus/Bacteria)	Pesticides/Herbicides	Petroleum Products	Phenols	Radioactivity	Sodium	Solvents	Sulphate	Surfactants (Detergents)	Overall Threat to Public Water Supply
Overall Threat to Public Health	L-M	L-M	L	L	L	H	M	L	H	H	H	H	L	H	L	L	
Mobility	M	L	H	H	M	L-H	H	L	L-H	M	M	L-H	H	H	H	H	
Natural Background	■		■	■	■	■						■	■		■		
Land Use Categories																	
Agriculture/Golf Course							■		■								M
Airports						■			■	■				■		■	M-H
Asphalt Plants										■							L-M
Beauty Parlours		■				■								■		■	L
Ship/Boat Yards/Builders						■				■	■			■			L
Car Washes			■			■				■			■	■		■	L
Cemeteries									■								L
Chemical Manufacture	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	H
Clandestine Dumping	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		H
Dry Cleaning														■			H
Furniture Stripping and Painting	■	■				■								■			M
Hazardous Materials Storage and Transfer	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	H
Industrial Lagoons and Pits	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	H
Jewellery and Metal Plating	■	■		■	■	■				■			■	■		■	M
Junkyards	■				■	■				■				■	■		L
Landfills	■		■		■	■	■	■	■	■	■	■	■	■	■		H
Laundromats								■						■		■	L-M
Machine Shops/Metal Working	■	■				■				■				■		■	H
Municipal Wastewater/Sewer Lines					■	■	■	■					■	■		■	H
Photography Labs/Printers	■	■				■								■		■	L-M
Railroad Tracks & Yards Maintenance Stations	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	M
Research Labs/ Universities/Hospitals	■	■		■	■	■	■	■	■	■	■	■		■		■	L-M
Road and Maintenance Depots			■						■	■			■	■			M
Sand and Gravel Mining/Washing										■				■			L
Septage Lagoons and Sludge			■		■	■	■	■					■	■		■	H
Septic Systems, Cesspools and Water Softeners			■		■	■	■	■	■				■	■		■	H
Stables, Feedlots, Kennels, Piggeries, Manure Pits							■	■					■				M-H
Stormwater Drains/Retention Basins			■			■		■	■	■			■	■			L-M
Stump Dumps					■	■	■				■		■				L
Underground Storage Tanks									■	■				■			H
Vehicular Services						■				■				■		■	H
Wood Preserving						■				■	■			■	■	■	L

Source: EPA, 1994: *"Handbook : Groundwater and Wellhead Protection"*, pp.175.

Table H-2
Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
CAROL'S PETRO CANADA	331119	5361183	147 ARTHUR ST W	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
CAROL'S PETRO CANADA	331119	5361183	147 ARTHUR ST W	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
CAROL'S PETRO CANADA	331119	5361183	147 ARTHUR ST W	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Double Wall UST
ELMWOOD INC	334169	5364086	808 FORT WILLIAM RD	THUNDER BAY	P7B 3A3	Liquid Fuel Single Wall UST
ELMWOOD INC	334169	5364086	808 FORT WILLIAM RD	THUNDER BAY	P7B 3A3	Liquid Fuel Single Wall UST
ELMWOOD INC	334169	5364086	808 FORT WILLIAM RD	THUNDER BAY	P7B 3A3	Liquid Fuel Single Wall UST
ELMWOOD INC	334169	5364086	808 FORT WILLIAM RD	THUNDER BAY	P7B 3A3	Liquid Fuel Single Wall UST
ELMWOOD INC	330401	5361123	508 ARTHUR ST W	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
ELMWOOD INC	330401	5361123	508 ARTHUR ST W	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
ELMWOOD INC	330401	5361123	508 ARTHUR ST W	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
ELMWOOD INC	330401	5361123	508 ARTHUR ST W	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Double Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Double Wall UST
CANADIAN PACIFIC RAILWAYS			SPRAGUE ST	THUNDER BAY	P7E 1E5	Liquid Fuel Single Wall UST
CANADIAN PACIFIC RAILWAYS			SPRAGUE ST	THUNDER BAY	P7E 1E5	Liquid Fuel Single Wall UST
CANADIAN PACIFIC RAILWAYS			(OFF) HEATH ST W	THUNDER BAY	P7E 1E5	Liquid Fuel Single Wall UST
CANADIAN PACIFIC RAILWAYS			(OFF) HEATH ST W	THUNDER BAY	P7E 1E5	Liquid Fuel Single Wall UST
LAKEHEAD ROOFING & SHEET METAL CO (1983) LTD	327832	5359051	1450 ROSSLYN RD	THUNDER BAY	P7C 4T9	Liquid Fuel Single Wall UST

Table H-2
Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
EKMAN ENTERPRISES INC			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
EKMAN ENTERPRISES INC			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
EKMAN ENTERPRISES INC			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
DUPORT LEASING LTD	329029	5360434	450 SIFTON AV	THUNDER BAY	P7E 6M2	Liquid Fuel Single Wall UST
DUPORT LEASING LTD			556 WEST ARTHUR ST	THUNDER BAY	P7E 5R7	Liquid Fuel Single Wall UST
AUTO HAULAWAY INC	332440	5361373	120 WATERLOO ST S	THUNDER BAY	P7E 2C3	Liquid Fuel Single Wall UST
THUNDER BAY HARBOUR IMPROVEMENTS LTD	335076	5364366	729 MAUREEN ST	THUNDER BAY	P7B 6T2	Liquid Fuel Single Wall UST
THUNDER BAY HARBOUR IMPROVEMENTS LTD	335076	5364366	729 MAUREEN ST	THUNDER BAY	P7B 6T2	Liquid Fuel Single Wall UST
THUNDER BAY HARBOUR IMPROVEMENTS LTD	335076	5364366	729 MAUREEN ST	THUNDER BAY	P7B 6T2	Liquid Fuel Single Wall UST
PALM DAIRIES LTD	332884	5362531	640 BALMORAL ST	THUNDER BAY	P7C 5G9	Liquid Fuel Single Wall UST
PALM DAIRIES LTD	332884	5362531	640 BALMORAL ST	THUNDER BAY	P7C 5G9	Liquid Fuel Single Wall UST
CANADIAN NATIONAL RAILWAYS PURCHASES & MATERIALS			NEEBING YARD	THUNDER BAY	P0T 2Z0	Liquid Fuel Single Wall UST
CANADIAN NATIONAL RAILWAYS PURCHASES & MATERIALS			NEEBING YARD	THUNDER BAY	P0T 2Z0	Liquid Fuel Single Wall UST
EKMAN ENTERPRISES INC			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
CITY OF THUNDER BAY TELEPHONE THUNDER BAY TELEPHONE DEPARTMENT			1050 LITHIUM DR	THUNDER BAY	P7B 6G3	Liquid Fuel Single Wall UST
CITY OF THUNDER BAY TELEPHONE THUNDER BAY TELEPHONE DEPARTMENT			1050 LITHIUM DR	THUNDER BAY	P7B 6G3	Liquid Fuel Single Wall UST
RUSTY MYERS FLYING SERVICE RUSTY MYERS FLYING SERVICE			ROLL 13000000	THUNDER BAY		Liquid Fuel Single Wall UST
RUSTY MYERS FLYING SERVICE RUSTY MYERS FLYING SERVICE			ROLL 13000000	THUNDER BAY		Liquid Fuel Single Wall UST
AGRICULTURE CANADA EXPERIMENTAL FARM			EXPERIMENTAL FARM	THUNDER BAY		Liquid Fuel Single Wall UST
AGRICULTURE CANADA EXPERIMENTAL FARM			EXPERIMENTAL FARM	THUNDER BAY		Liquid Fuel Single Wall UST
CANADIAN PACIFIC FOREST			ARTHUR ST	THUNDER BAY	P7C 4W3	Liquid Fuel Single Wall UST

Table H-2
Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
MNR THUNDER BAY FOREST NURSERY			25TH SIDE RD	THUNDER BAY	P7C 4T9	Liquid Fuel Single Wall UST
MNR THUNDER BAY FOREST NURSERY			25TH SIDE RD	THUNDER BAY	P7C 4T9	Liquid Fuel Single Wall UST
MNR THUNDER BAY FOREST NURSERY			25TH SIDE RD	THUNDER BAY	P7C 4T9	Liquid Fuel Single Wall UST
RUGGED AIR SYSTEMS	333114	5362795	710 NORAH CRES	THUNDER BAY	P7C 4T8	Liquid Fuel Single Wall UST
PROVINCIAL PAPERS DIV ABITIBI PRICE	339503	5369648	550 SHIPYARD RD	THUNDER BAY	P7B 5E9	Liquid Fuel Single Wall UST
ONTARIO HYDRO			108TH AV	THUNDER BAY	P7C 4X7	Liquid Fuel Single Wall UST
ONTARIO HYDRO			108TH AV	THUNDER BAY	P7C 4X7	Liquid Fuel Single Wall UST
BULK SYSTEMS ONTARIO LTD	333419	5364259	937 ALLOY DR	THUNDER BAY	P7B 5Z8	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			FRONT & EGAN ST	THUNDER BAY	P7A 7W7	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			410 MOUNTDALE AVE	THUNDER BAY	P7E 6G8	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			410 MOUNTDALE AVE	THUNDER BAY	P7E 6G8	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			410 MOUNTDALE AVE	THUNDER BAY	P7E 6G8	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			570 FORT WILLIAM RD	THUNDER BAY	P7B 2Z8	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			570 FORT WILLIAM RD	THUNDER BAY	P7B 2Z8	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			570 FORT WILLIAM RD	THUNDER BAY	P7B 2Z8	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			570 FORT WILLIAM RD	THUNDER BAY	P7B 2Z8	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION	333374	5361958	330 NORTH VICKERS ST	THUNDER BAY	P7C 4B2	Liquid Fuel Single Wall UST
J ROSSI	334437	5362209	544 SIMPSON ST	THUNDER BAY	P7C 3J4	Liquid Fuel Single Wall UST
J ROSSI	334437	5362209	544 SIMPSON ST	THUNDER BAY	P7C 3J4	Liquid Fuel Single Wall UST

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Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
ED NEWBOLD			112 NORTH CUMBERLAND	THUNDER BAY	P7B 1R1	Liquid Fuel Single Wall UST
ED NEWBOLD			112 NORTH CUMBERLAND	THUNDER BAY	P7B 1R1	Liquid Fuel Single Wall UST
ED NEWBOLD			112 NORTH CUMBERLAND	THUNDER BAY	P7B 1R1	Liquid Fuel Single Wall UST
RONALD MARGARIT	331706	5360064	911 KINGSWAY	THUNDER BAY	P7E 2B4	Liquid Fuel Single Wall UST
RONALD MARGARIT	331706	5360064	911 KINGSWAY	THUNDER BAY	P7E 2B4	Liquid Fuel Single Wall UST
RONALD MARGARIT	331706	5360064	911 KINGSWAY	THUNDER BAY	P7E 2B4	Liquid Fuel Single Wall UST
CROSSROADS SHELL TRUCK STOP O/A CROSSROADS MINI MART			HWY 11/17 & HWY 130	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
CROSSROADS SHELL TRUCK STOP O/A CROSSROADS MINI MART			HWY 11/17 & HWY 130	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
CROSSROADS SHELL TRUCK STOP O/A CROSSROADS MINI MART			HWY 11/17 & HWY 130	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
JAMES JAMES MAKI SHELL GAS BAR	329109	5361359	1145 ARTHUR ST W	THUNDER BAY	P7E 6E2	Liquid Fuel Single Wall UST
FRANKS SERVICE STATION (1986) LTD	335252	5366966	84 SOUTH ALGOMA ST	THUNDER BAY	P7B 3B5	Liquid Fuel Single Wall UST
FRANKS SERVICE STATION (1986) LTD	335252	5366966	84 SOUTH ALGOMA ST	THUNDER BAY	P7B 3B5	Liquid Fuel Single Wall UST
FRANKS SERVICE STATION (1986) LTD	335252	5366966	84 SOUTH ALGOMA ST	THUNDER BAY	P7B 3B5	Liquid Fuel Single Wall UST
BIG PINES TRAILER SALES 1998 LTD	336907	5368129	344 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4P2	Liquid Fuel Single Wall UST
BIG PINES TRAILER SALES 1998 LTD	336907	5368129	344 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4P2	Liquid Fuel Single Wall UST
BIG PINES TRAILER SALES 1998 LTD	336907	5368129	344 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4P2	Liquid Fuel Single Wall UST
TERRY DELAQUA			742 SIMPSON ST	THUNDER BAY	N3Y 4T2	Liquid Fuel Single Wall UST
TERRY DELAQUA			742 SIMPSON ST	THUNDER BAY	N3Y 4T2	Liquid Fuel Single Wall UST
SANTORELL & SONS THUNDER BAY LTD			LOT 5 E 1/2 CON 2	THUNDER BAY	L8K 5W9	Liquid Fuel Single Wall UST
SANTORELL & SONS THUNDER BAY LTD			LOT 5 E 1/2 CON 2	THUNDER BAY	L8K 5W9	Liquid Fuel Single Wall UST
SANTORELL & SONS THUNDER BAY LTD			LOT 5 E 1/2 CON 2	THUNDER BAY	L8K 5W9	Liquid Fuel Single Wall UST
SANTORELL & SONS THUNDER BAY LTD			LOT 5 E 1/2 CON 2	THUNDER BAY	L8K 5W9	Liquid Fuel Single Wall UST
SANTORELL & SONS THUNDER BAY LTD			LOT 5 E 1/2 CON 2	THUNDER BAY	L8K 5W9	Liquid Fuel Single Wall UST

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Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
SANTORELL & SONS THUNDER BAY LTD			LOT 5 E 1/2 CON 2	THUNDER BAY	L8K 5W9	Liquid Fuel Single Wall UST
SANTORELL & SONS THUNDER BAY LTD			LOT 5 E 1/2 CON 2	THUNDER BAY	L8K 5W9	Liquid Fuel Single Wall UST
SUPERIOR PROPANE ATTN WARREN HAYES	332326	5361184	230 WATERLOO ST S	THUNDER BAY	P7E 2C3	Liquid Fuel Single Wall UST
SUPERIOR PROPANE ATTN WARREN HAYES	332326	5361184	230 WATERLOO ST S	THUNDER BAY	P7E 2C3	Liquid Fuel Single Wall UST
SUPERIOR PROPANE ATTN WARREN HAYES	332326	5361184	230 WATERLOO ST S	THUNDER BAY	P7E 2C3	Liquid Fuel Single Wall UST
R AGOSTINO & SONS SERVICE STATION LTD	332435	5368237	1120 JOHN ST	THUNDER BAY	P7B 2A3	Liquid Fuel Single Wall UST
R AGOSTINO & SONS SERVICE STATION LTD	332435	5368237	1120 JOHN ST	THUNDER BAY	P7B 2A3	Liquid Fuel Single Wall UST
R AGOSTINO & SONS SERVICE STATION LTD	332435	5368237	1120 JOHN ST	THUNDER BAY	P7B 2A3	Liquid Fuel Single Wall UST
H T LEASING	334822	5365776	395 FORT WILLIAM RD	THUNDER BAY	P7B 2Z5	Liquid Fuel Single Wall UST
RED COACH RENTAL CORPORATION	329415	5360287	1475 WALSH ST W	THUNDER BAY	P7E 4X6	Liquid Fuel Single Wall UST
RED COACH RENTAL CORPORATION	329415	5360287	1475 WALSH ST W	THUNDER BAY	P7E 4X6	Liquid Fuel Single Wall UST
RED COACH RENTAL CORPORATION	334676	5366124	330 MEMORIAL AV	THUNDER BAY	P7B 3Y3	Liquid Fuel Single Wall UST
THE LAKEHEAD MOTORS LTD	333890	5364142	951 MEMORIAL AVE	THUNDER BAY	P7B 4A1	Liquid Fuel Single Wall UST
TEAM EFFORT SERVICES LTD	334311	5364047	399 MOONEY AVE	THUNDER BAY	P7B 5L5	Liquid Fuel Single Wall UST
ABITIBI MISSION ABITIBI PRICE INC FORT WILLIAM DIVISION			LAKE SHORE DR	THUNDER BAY	P7B 5E9	Liquid Fuel Single Wall UST
ABITIBI MISSION ABITIBI PRICE INC FORT WILLIAM DIVISION			LAKE SHORE DR	THUNDER BAY	P7B 5E9	Liquid Fuel Single Wall UST
ABITIBI MISSION ABITIBI PRICE INC FORT WILLIAM DIVISION			LAKE SHORE DR	THUNDER BAY	P7B 5E9	Liquid Fuel Single Wall UST
IRWIN READY MIX CONCRETE DIVISION OF LAFARGE CANADA INC	334342	5364247	771 FORT WILLIAM RD	THUNDER BAY	P7B 3A2	Liquid Fuel Single Wall UST
IRWIN READY MIX CONCRETE DIVISION OF LAFARGE CANADA INC	334342	5364247	771 FORT WILLIAM RD	THUNDER BAY	P7B 3A2	Liquid Fuel Single Wall UST

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Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
THUNDER BAY HARBOUR COMMISSION	335664	5364014	100 MAIN ST	THUNDER BAY	P7B 5E8	Liquid Fuel Single Wall UST
THUNDER BAY HARBOUR COMMISSION	335664	5364014	100 MAIN ST	THUNDER BAY	P7B 5E8	Liquid Fuel Single Wall UST
ONTARIO HYDRO			LOT 2 CON 4	THUNDER BAY		Liquid Fuel Single Wall UST
THUNDER BAY HYDRO	336543	5367670	37 FRONT ST	THUNDER BAY	P7A 4L4	Liquid Fuel Single Wall UST
THUNDER BAY HYDRO	336543	5367670	37 FRONT ST	THUNDER BAY	P7A 4L4	Liquid Fuel Single Wall UST
MINISTRY OF TRANSPORTATION			PRT OF LOT 23	THUNDER BAY		Liquid Fuel Single Wall UST
MINISTRY OF TRANSPORTATION			PRT OF LOT 23	THUNDER BAY		Liquid Fuel Single Wall UST
OLD FORT WILLIAM			KING RD	THUNDER BAY	P7C 5N5	Liquid Fuel Single Wall UST
OLD FORT WILLIAM			KING RD	THUNDER BAY	P7C 5N5	Liquid Fuel Single Wall UST
KINGSWAY TRANSPORTS LTD ATTN FRED KING	332877	5362315	470 BALMORAL ST	THUNDER BAY	P7C 5G8	Liquid Fuel Single Wall UST
KINGSWAY TRANSPORTS LTD ATTN FRED KING	332877	5362315	470 BALMORAL ST	THUNDER BAY	P7C 5G8	Liquid Fuel Single Wall UST
TOWLAND HEWITSON CONST LTD ATTN PETER			1340 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
TOWLAND HEWITSON CONST LTD ATTN PETER			1340 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
GREYHOUND LINES OF CANADA	334253	5364046	815 FORT WILLIAM RD	THUNDER BAY	P7B 3A4	Liquid Fuel Single Wall UST
MCKINLAY TRANSPORT LTD			UNSURVEYED TERRITORY	THUNDER BAY		Liquid Fuel Single Wall UST
CANADIAN PACIFIC FOREST			CROWNLAND	THUNDER BAY		Liquid Fuel Single Wall UST
CANADIAN PACIFIC FOREST			CROWNLAND	THUNDER BAY		Liquid Fuel Single Wall UST
CANADIAN PACIFIC FOREST			CROWNLAND	THUNDER BAY		Liquid Fuel Single Wall UST
CANADIAN PACIFIC FOREST			CROWNLAND	THUNDER BAY		Liquid Fuel Single Wall UST

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Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
CANADIAN PACIFIC FOREST			CROWNLAND	THUNDER BAY		Liquid Fuel Single Wall UST
CANADIAN PACIFIC FOREST			CROWNLAND	THUNDER BAY		Liquid Fuel Single Wall UST
CANADIAN PACIFIC FOREST			CROWNLAND	THUNDER BAY		Liquid Fuel Single Wall UST
CANADIAN PACIFIC FOREST			CROWNLAND	THUNDER BAY		Liquid Fuel Single Wall UST
HARRY BARROW ENTERPRISES LTD	336975	5368189	368 CUMBERLAND ST N	THUNDER BAY	P7A 4P3	Liquid Fuel Single Wall UST
HARRY BARROW ENTERPRISES LTD	336975	5368189	368 CUMBERLAND ST N	THUNDER BAY	P7A 4P3	Liquid Fuel Single Wall UST
ONTARIO HYDRO			205 BURWOOD RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
ONTARIO HYDRO			205 BURWOOD RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
PUROLATOR COURIER LTD	335346	5363937	140 MAIN ST	THUNDER BAY	P7B 6S4	Liquid Fuel Single Wall UST
GREAT WEST TIMBER ATTN BARRY LYSY	337319	5368116	137 CLAVET ST	THUNDER BAY	P7B 5G6	Liquid Fuel Single Wall UST
DWAYNE R WESTFORT ESSO SERVICE DWAYNE R CAMPBELL	331645	5359771	1125 FORD ST	THUNDER BAY	P7E 6E1	Liquid Fuel Single Wall UST
DWAYNE R WESTFORT ESSO SERVICE DWAYNE R CAMPBELL	331645	5359771	1125 FORD ST	THUNDER BAY	P7E 6E1	Liquid Fuel Single Wall UST
DWAYNE R WESTFORT ESSO SERVICE DWAYNE R CAMPBELL	331645	5359771	1125 FORD ST	THUNDER BAY	P7E 6E1	Liquid Fuel Single Wall UST
CITY OF THUNDER BAY O/A PRINCE ARTHUR LANDING MARINA			MARINA PARK-WATER ST	THUNDER BAY	P7E 2S4	Liquid Fuel Single Wall UST
CITY OF THUNDER BAY O/A PRINCE ARTHUR LANDING MARINA			MARINA PARK-WATER ST	THUNDER BAY	P7E 2S4	Liquid Fuel Single Wall UST
BEAVER GAS BAR - FREDERICA			408 FREDERICA ST W	THUNDER BAY	P7E 3W6	Liquid Fuel Single Wall UST
BEAVER GAS BAR - FREDERICA			408 FREDERICA ST W	THUNDER BAY	P7E 3W6	Liquid Fuel Single Wall UST
BEAVER GAS BAR - FREDERICA			408 FREDERICA ST W	THUNDER BAY	P7E 3W6	Liquid Fuel Single Wall UST
BEAVER GAS BAR - FREDERICA			408 FREDERICA ST W	THUNDER BAY	P7E 3W6	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
WILLIAM ESARIK			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
WILLIAM ESARIK			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
WILLIAM ESARIK			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
WILLIAM ESARIK			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
WILLIAM ESARIK			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
SUNYS ENERGY INC	329300	5361147	790 WEST ARTHUR ST	THUNDER BAY	P7E 5R9	Liquid Fuel Single Wall UST
SUNYS ENERGY INC	329300	5361147	790 WEST ARTHUR ST	THUNDER BAY	P7E 5R9	Liquid Fuel Single Wall UST
SUNYS ENERGY INC	329300	5361147	790 WEST ARTHUR ST	THUNDER BAY	P7E 5R9	Liquid Fuel Single Wall UST
539124 ONTARIO LTD HUSKY S/S & MINI MART	330474	5359440	421 FREDERICA ST W	THUNDER BAY	P7E 3W5	Liquid Fuel Single Wall UST
539124 ONTARIO LTD HUSKY S/S & MINI MART	330474	5359440	421 FREDERICA ST W	THUNDER BAY	P7E 3W5	Liquid Fuel Single Wall UST
539124 ONTARIO LTD HUSKY S/S & MINI MART	330474	5359440	421 FREDERICA ST W	THUNDER BAY	P7E 3W5	Liquid Fuel Single Wall UST
DALES SERVICE CENTRE	333306	5361471	1001 VICTORIA AV E	THUNDER BAY	P7C 1B5	Liquid Fuel Single Wall UST
DALES SERVICE CENTRE	333306	5361471	1001 VICTORIA AV E	THUNDER BAY	P7C 1B5	Liquid Fuel Single Wall UST
DALES SERVICE CENTRE	333306	5361471	1001 VICTORIA AV E	THUNDER BAY	P7C 1B5	Liquid Fuel Single Wall UST
DALES SERVICE CENTRE	333306	5361471	1001 VICTORIA AV E	THUNDER BAY	P7C 1B5	Liquid Fuel Single Wall UST
SOUTH NEEBING VARIETY 663689 ONTARIO LTD	325130	5354243	HWY 61 S	THUNDER BAY	L1N 2J6	Liquid Fuel Single Wall UST
SOUTH NEEBING VARIETY 663689 ONTARIO LTD	325130	5354243	HWY 61 S	THUNDER BAY	L1N 2J6	Liquid Fuel Single Wall UST
SOUTH NEEBING VARIETY 663689 ONTARIO LTD	325130	5354243	HWY 61 S	THUNDER BAY	L1N 2J6	Liquid Fuel Single Wall UST
TOWLAND HEWITSON CONST LTD ATTN PETER			1340 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
TOWLAND HEWITSON CONST LTD ATTN PETER			1340 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
1203808 ONTARIO LTD	333271	5368952	1063 DAWSON RD	THUNDER BAY	P7B 1K7	Liquid Fuel Single Wall UST
1203808 ONTARIO LTD	333271	5368952	1063 DAWSON RD	THUNDER BAY	P7B 1K7	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
1203808 ONTARIO LTD	333271	5368952	1063 DAWSON RD	THUNDER BAY	P7B 1K7	Liquid Fuel Single Wall UST
1203808 ONTARIO LTD	333271	5368952	1063 DAWSON RD	THUNDER BAY	P7B 1K7	Liquid Fuel Single Wall UST
TJS CONVENIENCE PLUS	330446	5361115	500 WEST ARTHUR ST	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
TJS CONVENIENCE PLUS	330446	5361115	500 WEST ARTHUR ST	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
TJS CONVENIENCE PLUS	330446	5361115	500 WEST ARTHUR ST	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
ESSO IMPERIAL OIL PRODUCTS & CHEMICALS DIVISION**			1 MCKELLAR ISLAND	THUNDER BAY	L0L 2L0	Liquid Fuel Single Wall UST
ESSO IMPERIAL OIL PRODUCTS & CHEMICALS DIVISION**			1 MCKELLAR ISLAND	THUNDER BAY	L0L 2L0	Liquid Fuel Single Wall UST
SUNYS ENERGY INC	331268	5352474	425 EDWARD ST N	THUNDER BAY	P7C 4P7	Liquid Fuel Single Wall UST
SUNYS ENERGY INC	331268	5352474	425 EDWARD ST N	THUNDER BAY	P7C 4P7	Liquid Fuel Single Wall UST
SUNYS ENERGY INC	331268	5352474	425 EDWARD ST N	THUNDER BAY	P7C 4P7	Liquid Fuel Single Wall UST
SUNYS ENERGY INC	331268	5352474	425 EDWARD ST N	THUNDER BAY	P7C 4P7	Liquid Fuel Single Wall UST
SUNYS ENERGY INC	331268	5352474	425 EDWARD ST N	THUNDER BAY	P7C 4P7	Liquid Fuel Single Wall UST
CANGO INC	333431	5369023	1020 DAWSON RD	THUNDER BAY	P7B 5V1	Liquid Fuel Single Wall UST
CANGO INC	333431	5369023	1020 DAWSON RD	THUNDER BAY	P7B 5V1	Liquid Fuel Single Wall UST
CANGO INC	333431	5369023	1020 DAWSON RD	THUNDER BAY	P7B 5V1	Liquid Fuel Single Wall UST
CANGO INC	333431	5369023	1020 DAWSON RD	THUNDER BAY	P7B 5V1	Liquid Fuel Single Wall UST
CANGO INC	333431	5369023	1020 DAWSON RD	THUNDER BAY	P7B 5V1	Liquid Fuel Single Wall UST
CANGO INC	333431	5369023	1020 DAWSON RD	THUNDER BAY	P7B 5V1	Liquid Fuel Single Wall UST
WILLIAM ESARIK	336250	5369424	273 SHUNIAH ST	THUNDER BAY	P7A 3A1	Liquid Fuel Single Wall UST

Table H-2
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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
WILLIAM ESARIK	336250	5369424	273 SHUNIAH ST	THUNDER BAY	P7A 3A1	Liquid Fuel Single Wall UST
WILLIAM ESARIK	336250	5369424	273 SHUNIAH ST	THUNDER BAY	P7A 3A1	Liquid Fuel Single Wall UST
SHELL SELECT FOOD STORE	333712	5368479	888 RED RIVER RD	THUNDER BAY	P7B 1K2	Liquid Fuel Single Wall UST
SHELL SELECT FOOD STORE	333712	5368479	888 RED RIVER RD	THUNDER BAY	P7B 1K2	Liquid Fuel Single Wall UST
SHELL SELECT FOOD STORE	333712	5368479	888 RED RIVER RD	THUNDER BAY	P7B 1K2	Liquid Fuel Single Wall UST
SHELL SELECT FOOD STORE	333712	5368479	888 RED RIVER RD	THUNDER BAY	P7B 1K2	Liquid Fuel Single Wall UST
SHELL SELECT FOOD STORE	333712	5368479	888 RED RIVER RD	THUNDER BAY	P7B 1K2	Liquid Fuel Single Wall UST
SHELL SELECT FOOD STORE	333712	5368479	888 RED RIVER RD	THUNDER BAY	P7B 1K2	Liquid Fuel Single Wall UST
GREAT WEST TIMBER ATTN BARRY LYSY	337319	5368116	137 CLAVET ST	THUNDER BAY	P7B 5G6	Liquid Fuel Single Wall UST
ONTARIO HYDRO THERMAL GENERATING STATION			106TH AV	THUNDER BAY	P7C 4X7	Liquid Fuel Single Wall UST
ONTARIO HYDRO THERMAL GENERATING STATION			106TH AV	THUNDER BAY	P7C 4X7	Liquid Fuel Single Wall UST
MINISTRY OF SOLICITOR GENERAL ONT PROVINCIAL POLICE TRANS & SUPPLY BR	337104	5368703	489 ALGOMA ST N	THUNDER BAY	P7A 8B1	Liquid Fuel Single Wall UST
MINISTRY OF SOLICITOR GENERAL ONT PROVINCIAL POLICE TRANS & SUPPLY BR	337104	5368703	489 ALGOMA ST N	THUNDER BAY	P7A 8B1	Liquid Fuel Single Wall UST
BUCHANAN FOREST PRODUCTS			GRAHAM RD	THUNDER BAY		Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			FRONT & EGAN ST	THUNDER BAY	P7A 7W7	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			FRONT & EGAN ST	THUNDER BAY	P7A 7W7	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			PENTO RD	THUNDER BAY		Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			JOHN ST	THUNDER BAY	P7B 5E2	Liquid Fuel Single Wall UST
NOR-SHORE MIX CONCRETE PRODUCTS LTD	333361	5363586	610 HEWITSON ST	THUNDER BAY	P7B 6E4	Liquid Fuel Single Wall UST
TRANS CANADA PIPELINES LTD			COMPRESSER RD S	THUNDER BAY	P7B 6B3	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
TRANS CANADA PIPELINES LTD			COMPRESSER RD S	THUNDER BAY	P7B 6B3	Liquid Fuel Single Wall UST
TRANS CANADA PIPELINES LTD			COMPRESSER STN 69	THUNDER BAY	P7B 6B3	Liquid Fuel Single Wall UST
TRANS CANADA PIPELINES LTD			COMPRESSER STN 69	THUNDER BAY	P7B 6B3	Liquid Fuel Single Wall UST
JACK TURNER MOTORS	329609	5360230	1220 COMMERCE ST	THUNDER BAY	P7E 6E9	Liquid Fuel Single Wall UST
CONFEDERATION COLLEGE			1450 NAKINA RD	THUNDER BAY	P7C 4W1	Liquid Fuel Single Wall UST
MINISTRY OF NATURAL RESOURCES ATTN GARY ADOMKO	327331	5361029	1580 ARTHUR ST W	THUNDER BAY	P7C 5G6	Liquid Fuel Single Wall UST
MINISTRY OF NATURAL RESOURCES ATTN GARY ADOMKO	327331	5361029	1580 ARTHUR ST W	THUNDER BAY	P7C 5G6	Liquid Fuel Single Wall UST
MINISTRY OF NATURAL RESOURCES ATTN GARY ADOMKO	327331	5361029	1580 ARTHUR ST W	THUNDER BAY	P7C 5G6	Liquid Fuel Single Wall UST
BOWATER PULP & PAPER CANADA INC.			2001 NEEBING AV	THUNDER BAY	P7E 6S3	Liquid Fuel Single Wall UST
BOWATER PULP & PAPER CANADA INC.			2001 NEEBING AV	THUNDER BAY	P7E 6S3	Liquid Fuel Single Wall UST
BOWATER PULP & PAPER CANADA INC.			2001 NEEBING AV	THUNDER BAY	P7E 6S3	Liquid Fuel Single Wall UST
BOWATER PULP & PAPER CANADA INC.			2001 NEEBING AV	THUNDER BAY	P7E 6S3	Liquid Fuel Single Wall UST
EKMAN ENTERPRISES INC			807 RED RIVER RD	THUNDER BAY	P7B 1K3	Liquid Fuel Single Wall UST
SHERRY PELLETIER			221-223 HWY 61B CHIPPEWA RD	THUNDER BAY	P7C 4Z2	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Double Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTED	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST

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Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
OLIVER ROAD CAN-OP	330204	5365209	1419 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
CITY OF THUNDER BAY O/A PRINCE ARTHUR LANDING MARINA			MARINA PARK-WATER ST	THUNDER BAY	P7E 2S4	Liquid Fuel Single Wall UST
AMEC C/O LOOMIS SERVICE			(OFF) HWY 527	THUNDER BAY		Liquid Fuel Single Wall UST
AMEC C/O LOOMIS SERVICE			(OFF) HWY 527	THUNDER BAY		Liquid Fuel Single Wall UST
AMEC C/O LOOMIS SERVICE			(OFF) HWY 527	THUNDER BAY		Liquid Fuel Single Wall UST
AMEC C/O LOOMIS SERVICE			(OFF) HWY 527	THUNDER BAY		Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Double Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Double Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Double Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Double Wall UST
CANADA SAFEWAY LTD			681 WEST ARTHUR ST	THUNDER BAY		Liquid Fuel Double Wall UST
EKMAN ENTERPRISES INC			408 FREDERICA ST W	THUNDER BAY	P7E 3W6	Liquid Fuel Single Wall UST
EKMAN ENTERPRISES INC			408 FREDERICA ST W	THUNDER BAY	P7E 3W6	Liquid Fuel Single Wall UST
EKMAN ENTERPRISES INC			408 FREDERICA ST W	THUNDER BAY	P7E 3W6	Liquid Fuel Single Wall UST
EKMAN ENTERPRISES INC			408 FREDERICA ST W	THUNDER BAY	P7E 3W6	Liquid Fuel Single Wall UST
BUCHANAN FOREST PRODUCTS			MILE 70 OGOKI RD	THUNDER BAY		Liquid Fuel Double Wall UST
BUCHANAN FOREST PRODUCTS			MILE 70 OGOKI RD	THUNDER BAY		Liquid Fuel Double Wall UST
BUCHANAN FOREST PRODUCTS			MILE 70 OGOKI RD	THUNDER BAY		Liquid Fuel Double Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
AMEC C/O LOOMIS SERVICE			(OFF) HWY 527	THUNDER BAY		Liquid Fuel Single Wall UST
PROVINCIAL PAPERS INC A SUBSIDIARY OF ROLLAND INC			550 SHIPYARD RD	THUNDER BAY	P7B 5E9	Liquid Fuel Single Wall UST
CITY OF THUNDER BAY O/A PRINCE ARTHUR LANDING MARINA			MARINA PARK-WATER ST	THUNDER BAY	P7E 2S4	Liquid Fuel Single Wall UST
OLIVER ROAD CAN-OP	330204	5365209	1419 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
CANGO INC**	330401	5361123	508 ARTHUR ST W	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
TRIANGLE ESSO			310 FORT WILLIAM RD	THUNDER BAY	P7B 2Z1	Liquid Fuel Single Wall UST
TRIANGLE ESSO			310 FORT WILLIAM RD	THUNDER BAY	P7B 2Z1	Liquid Fuel Single Wall UST
TRIANGLE ESSO			310 FORT WILLIAM RD	THUNDER BAY	P7B 2Z1	Liquid Fuel Single Wall UST
TRIANGLE ESSO			310 FORT WILLIAM RD	THUNDER BAY	P7B 2Z1	Liquid Fuel Single Wall UST
TRIANGLE ESSO			310 FORT WILLIAM RD	THUNDER BAY	P7B 2Z1	Liquid Fuel Single Wall UST
539745 ONTARIO LTD	338655	5370148	361 HODDER AV	THUNDER BAY	P7A 1T6	Liquid Fuel Single Wall UST
539745 ONTARIO LTD	338655	5370148	361 HODDER AV	THUNDER BAY	P7A 1T6	Liquid Fuel Single Wall UST
RONALD W LONG ENTERPRISES LTD	333758	5363452	1160 MEMORIAL AVE	THUNDER BAY	P7B 5K5	Liquid Fuel Single Wall UST
RONALD W LONG ENTERPRISES LTD	333758	5363452	1160 MEMORIAL AVE	THUNDER BAY	P7B 5K5	Liquid Fuel Single Wall UST
VET ENTERPRISES VICTOR TOMASZEWSKI	334839	5368578	640 RIVER ST	THUNDER BAY	P7A 3S4	Liquid Fuel Single Wall UST
VET ENTERPRISES VICTOR TOMASZEWSKI	334839	5368578	640 RIVER ST	THUNDER BAY	P7A 3S4	Liquid Fuel Single Wall UST
VET ENTERPRISES VICTOR TOMASZEWSKI	334839	5368578	640 RIVER ST	THUNDER BAY	P7A 3S4	Liquid Fuel Single Wall UST
VET ENTERPRISES VICTOR TOMASZEWSKI	334839	5368578	640 RIVER ST	THUNDER BAY	P7A 3S4	Liquid Fuel Single Wall UST
CANGO INC**			508 ARTHUR ST W	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
CANGO INC**			508 ARTHUR ST W	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST
CANGO INC**			508 ARTHUR ST W	THUNDER BAY	P7E 5R4	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
KIRK MACLAURIN O/A MOUNTAIN VIEW VARIETY			LOT 52 CITY RD	THUNDER BAY	P7C 4Z2	Liquid Fuel Single Wall UST
PETRO CANADA SELF SERVE			156 ALGOMA ST S	THUNDER BAY	P7B 3B8	Liquid Fuel Single Wall UST
PETRO CANADA SELF SERVE			156 ALGOMA ST S	THUNDER BAY	P7B 3B8	Liquid Fuel Single Wall UST
PETRO CANADA SELF SERVE			156 ALGOMA ST S	THUNDER BAY	P7B 3B8	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	335373	5367052	71 SOUTH ALGOMA ST	THUNDER BAY	P7B 3B4	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	335373	5367052	71 SOUTH ALGOMA ST	THUNDER BAY	P7B 3B4	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	335373	5367052	71 SOUTH ALGOMA ST	THUNDER BAY	P7B 3B4	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	335373	5367052	71 SOUTH ALGOMA ST	THUNDER BAY	P7B 3B4	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	338674	5370645	475 HODDER AV	THUNDER BAY	P7A 1V3	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	338674	5370645	475 HODDER AV	THUNDER BAY	P7A 1V3	Liquid Fuel Single Wall UST
J P MOTT ENTERPRISES LTD	334185	5363649	929 FORT WILLIAM RD	THUNDER BAY	P7B 3A6	Liquid Fuel Single Wall UST
J P MOTT ENTERPRISES LTD	334185	5363649	929 FORT WILLIAM RD	THUNDER BAY	P7B 3A6	Liquid Fuel Single Wall UST
J P MOTT ENTERPRISES LTD	334185	5363649	929 FORT WILLIAM RD	THUNDER BAY	P7B 3A6	Liquid Fuel Single Wall UST
J P MOTT ENTERPRISES LTD	334185	5363649	929 FORT WILLIAM RD	THUNDER BAY	P7B 3A6	Liquid Fuel Single Wall UST
1037613 ONTARIO LTD O/A LEPPANENS STORE AND SERVICE INC	324697	5373668	3130 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
1037613 ONTARIO LTD O/A LEPPANENS STORE AND SERVICE INC	324697	5373668	3130 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
KIRK MACLAURIN O/A MOUNTAIN VIEW VARIETY			LOT 52 CITY RD	THUNDER BAY	P7C 4Z2	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
HERCHAK SERVICE	333544	5361042	301 SYNDICATE AV S	THUNDER BAY	P7E 1E2	Liquid Fuel Single Wall UST
HERCHAK SERVICE	333544	5361042	301 SYNDICATE AV S	THUNDER BAY	P7E 1E2	Liquid Fuel Single Wall UST
JOHN LIVITSKI L/A FAIRWAY VARIETY STORE			LOT 6 CON 1 SITE 5	THUNDER BAY	N9B 1C1	Liquid Fuel Single Wall UST
JOHN LIVITSKI L/A FAIRWAY VARIETY STORE			LOT 6 CON 1 SITE 5	THUNDER BAY	N9B 1C1	Liquid Fuel Single Wall UST
WILLIAM COLE	332591	5369378	1205 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
WILLIAM COLE	332591	5369378	1205 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
1204741 ONTARIO INC O/A YOUR COUNTRY CORNER	326493	5355741	1725 HWY 61	THUNDER BAY	P7J 1G3	Liquid Fuel Single Wall UST
1204741 ONTARIO INC O/A YOUR COUNTRY CORNER	326493	5355741	1725 HWY 61	THUNDER BAY	P7J 1G3	Liquid Fuel Single Wall UST
1204741 ONTARIO INC O/A YOUR COUNTRY CORNER	326493	5355741	1725 HWY 61	THUNDER BAY	P7J 1G3	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT	331251	5361107	100 WEST ARTHUR ST	THUNDER BAY	P7E 5P6	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT	331251	5361107	100 WEST ARTHUR ST	THUNDER BAY	P7E 5P6	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT	331251	5361107	100 WEST ARTHUR ST	THUNDER BAY	P7E 5P6	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT	331251	5361107	100 WEST ARTHUR ST	THUNDER BAY	P7E 5P6	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LTD **	330912	5361178	251 WEST ARTHUR ST	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT	333623	5368519	915 RED RIVER RD	THUNDER BAY	P7B 1K5	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT	333623	5368519	915 RED RIVER RD	THUNDER BAY	P7B 1K5	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT	333623	5368519	915 RED RIVER RD	THUNDER BAY	P7B 1K5	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT	333623	5368519	915 RED RIVER RD	THUNDER BAY	P7B 1K5	Liquid Fuel Single Wall UST
539124 ONTARIO LTD AIRLANE HUSKY	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
539124 ONTARIO LTD AIRLANE HUSKY	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
539124 ONTARIO LTD AIRLANE HUSKY	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	338674	5370645	475 HODDER AV	THUNDER BAY	P7A 1V3	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
MAC'S CONVENIENCE STORES INC	338674	5370645	475 HODDER AV	THUNDER BAY	P7A 1V3	Liquid Fuel Single Wall UST
OLIVER ROAD CAN-OP	330204	5365209	1419 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
SPADONI LEASING LIMITED	329029	5360434	450 SIFTON AV	THUNDER BAY	P7E 6M2	Liquid Fuel Single Wall UST
ARTHUR STREET HUSKY GAS BAR AND FOOD STORE TED MITAS	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
ARTHUR STREET HUSKY GAS BAR AND FOOD STORE TED MITAS	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
ARTHUR STREET HUSKY GAS BAR AND FOOD STORE TED MITAS	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
LYNLARK ENTERPRISES LIMITED	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
LYNLARK ENTERPRISES LIMITED	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
LYNLARK ENTERPRISES LIMITED	329801	5361143	666 ARTHUR ST W	THUNDER BAY	P7E 5R8	Liquid Fuel Single Wall UST
MINISTRY OF TRANSPORTATION			801 WALSH ST W	THUNDER BAY	P7C 4X9	Liquid Fuel Double Wall UST
MINISTRY OF TRANSPORTATION			801 WALSH ST W	THUNDER BAY	P7C 4X9	Liquid Fuel Double Wall UST
1358811 ONTARIO LTD O/A GOODWIN HUSKY & BULK SALES	332980	5364270	950 COBALT CRES	THUNDER BAY	P7B 5W3	Liquid Fuel Single Wall UST
1358811 ONTARIO LTD O/A GOODWIN HUSKY & BULK SALES	332980	5364270	950 COBALT CRES	THUNDER BAY	P7B 5W3	Liquid Fuel Single Wall UST
1358811 ONTARIO LTD O/A GOODWIN HUSKY & BULK SALES	332980	5364270	950 COBALT CRES	THUNDER BAY	P7B 5W3	Liquid Fuel Single Wall UST
1358811 ONTARIO LTD O/A GOODWIN HUSKY & BULK SALES	332980	5364270	950 COBALT CRES	THUNDER BAY	P7B 5W3	Liquid Fuel Single Wall UST
1358811 ONTARIO LTD O/A GOODWIN HUSKY & BULK SALES	332980	5364270	950 COBALT CRES	THUNDER BAY	P7B 5W3	Liquid Fuel Single Wall UST
1358811 ONTARIO LTD O/A GOODWIN HUSKY & BULK SALES	332980	5364270	950 COBALT CRES	THUNDER BAY	P7B 5W3	Liquid Fuel Single Wall UST
1358811 ONTARIO LTD O/A GOODWIN HUSKY & BULK SALES	332980	5364270	950 COBALT CRES	THUNDER BAY	P7B 5W3	Liquid Fuel Single Wall UST
1358811 ONTARIO LTD O/A GOODWIN HUSKY & BULK SALES	332980	5364270	950 COBALT CRES	THUNDER BAY	P7B 5W3	Liquid Fuel Single Wall UST
E.C. AND COMPANY LIMITED O/A CRYSTAL BEACH VARIETY			HWY 17 E SITE 15	THUNDER BAY	P7B 5E4	Liquid Fuel Single Wall UST
E.C. AND COMPANY LIMITED O/A CRYSTAL BEACH VARIETY			HWY 17 E SITE 15	THUNDER BAY	P7B 5E4	Liquid Fuel Single Wall UST
E.C. AND COMPANY LIMITED O/A CRYSTAL BEACH VARIETY			HWY 17 E SITE 15	THUNDER BAY	P7B 5E4	Liquid Fuel Single Wall UST

Table H-2
Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
CROSSROADS MINI MART			HWY 11/17 & HWY 130	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
CROSSROADS MINI MART			HWY 11/17 & HWY 130	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
CROSSROADS MINI MART			HWY 11/17 & HWY 130	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
ROSSLYN AUTO CENTRE ATTN JACK MCINNIS & CORY HURLEY	323966	5359380	2381 ROSSLYN RD	THUNDER BAY	P7C 4T9	Liquid Fuel Single Wall UST
ROSSLYN AUTO CENTRE ATTN JACK MCINNIS & CORY HURLEY	323966	5359380	2381 ROSSLYN RD	THUNDER BAY	P7C 4T9	Liquid Fuel Single Wall UST
606637 ONTARIO LTD O/A CENTRAL CARE CAR CENTRE			1260 AMBER DR	THUNDER BAY	P7B 6M6	Liquid Fuel Double Wall UST
606637 ONTARIO LTD O/A CENTRAL CARE CAR CENTRE			1260 AMBER DR	THUNDER BAY	P7B 6M6	Liquid Fuel Double Wall UST
606637 ONTARIO LTD O/A CENTRAL CARE CAR CENTRE			1260 AMBER DR	THUNDER BAY	P7B 6M6	Liquid Fuel Double Wall UST
MUNICIPALITY OF NEEBING			9 CLOUD RIVER RD W	THUNDER BAY	P7C 5V5	Liquid Fuel Single Wall UST
MUNICIPALITY OF NEEBING			9 CLOUD RIVER RD W	THUNDER BAY	P7C 5V5	Liquid Fuel Single Wall UST
ASSERGI GENERAL STORE SERGIO SACCHETTI	325921	5361320	1925 ARTHUR ST W	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
ASSERGI GENERAL STORE SERGIO SACCHETTI	325921	5361320	1925 ARTHUR ST W	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
BRUNOS VARIETY	329754	5371322	1921 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
BRUNOS VARIETY	329754	5371322	1921 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
BRUNOS VARIETY	329754	5371322	1921 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
451197 ONTARIO LTD ATTN: JASMEETA CHOHAN			1869 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
451197 ONTARIO LTD ATTN: JASMEETA CHOHAN			1869 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
451197 ONTARIO LTD ATTN: JASMEETA CHOHAN			1869 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
451197 ONTARIO LTD ATTN: JASMEETA CHOHAN			1869 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
451197 ONTARIO LTD ATTN: JASMEETA CHOHAN			1869 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
451197 ONTARIO LTD ATTN: JASMEETA CHOHAN			1869 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
451197 ONTARIO LTD ATTN: JASMEETA CHOHAN			1869 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
451197 ONTARIO LTD ATTN: JASMEETA CHOHAN			1869 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
BRENDA AND DOUGLAS LAIDLER CLOUD RIVER TRADING POST			HWY 61	THUNDER BAY		Liquid Fuel Single Wall UST
BRENDA AND DOUGLAS LAIDLER CLOUD RIVER TRADING POST			HWY 61	THUNDER BAY		Liquid Fuel Single Wall UST
ICG UTILITES ONTARIO LTD	333353	5363218	1230 CARRICK ST	THUNDER BAY	P7B 5P9	Liquid Fuel Single Wall UST
502010 ONTARIO LTD NORTHWOOD ESSO	331409	5362543	436 EDWARD ST N	THUNDER BAY	P7C 4P8	Liquid Fuel Single Wall UST
502010 ONTARIO LTD NORTHWOOD ESSO	331409	5362543	436 EDWARD ST N	THUNDER BAY	P7C 4P8	Liquid Fuel Single Wall UST
502010 ONTARIO LTD NORTHWOOD ESSO	331409	5362543	436 EDWARD ST N	THUNDER BAY	P7C 4P8	Liquid Fuel Single Wall UST
502010 ONTARIO LTD NORTHWOOD ESSO	331409	5362543	436 EDWARD ST N	THUNDER BAY	P7C 4P8	Liquid Fuel Single Wall UST
1315 ARTHUR ST EAST ESSO MAVIS FIEBER	332941	5361123	1315 ARTHUR ST E	THUNDER BAY	P7E 5N3	Liquid Fuel Single Wall UST
1315 ARTHUR ST EAST ESSO MAVIS FIEBER	332941	5361123	1315 ARTHUR ST E	THUNDER BAY	P7E 5N3	Liquid Fuel Single Wall UST
1315 ARTHUR ST EAST ESSO MAVIS FIEBER	332941	5361123	1315 ARTHUR ST E	THUNDER BAY	P7E 5N3	Liquid Fuel Single Wall UST
1315 ARTHUR ST EAST ESSO MAVIS FIEBER	332941	5361123	1315 ARTHUR ST E	THUNDER BAY	P7E 5N3	Liquid Fuel Single Wall UST
897419 ONTARIO INC PETES AUTO SERVICE & SALES INC	335438	5370263	108 WARDROPE AVE	THUNDER BAY	P7B 5N1	Liquid Fuel Single Wall UST
897419 ONTARIO INC PETES AUTO SERVICE & SALES INC	335438	5370263	108 WARDROPE AVE	THUNDER BAY	P7B 5N1	Liquid Fuel Single Wall UST
897419 ONTARIO INC PETES AUTO SERVICE & SALES INC	335438	5370263	108 WARDROPE AVE	THUNDER BAY	P7B 5N1	Liquid Fuel Single Wall UST
897419 ONTARIO INC PETES AUTO SERVICE & SALES INC	335438	5370263	108 WARDROPE AVE	THUNDER BAY	P7B 5N1	Liquid Fuel Single Wall UST
GRANDVIEW SERVICE			530 RIVER ST	THUNDER BAY	P7A 3S4	Liquid Fuel Single Wall UST
GRANDVIEW SERVICE			530 RIVER ST	THUNDER BAY	P7A 3S4	Liquid Fuel Single Wall UST
GRANDVIEW SERVICE			530 RIVER ST	THUNDER BAY	P7A 3S4	Liquid Fuel Single Wall UST
BIG PINE TRAILER SALES	336907	5368129	344 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4P2	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
BIG PINE TRAILER SALES	336907	5368129	344 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4P2	Liquid Fuel Single Wall UST
BIG PINE TRAILER SALES	336907	5368129	344 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4P2	Liquid Fuel Single Wall UST
IMPERIAL OIL ATTN: DEBBIE OSTRIDGE	330005	5360679	645 MOUNTDALE AVE	THUNDER BAY	P7E 6E5	Liquid Fuel Single Wall UST
IMPERIAL OIL ATTN: DEBBIE OSTRIDGE	330005	5360679	645 MOUNTDALE AVE	THUNDER BAY	P7E 6E5	Liquid Fuel Single Wall UST
IMPERIAL OIL ATTN: DEBBIE OSTRIDGE	330005	5360679	645 MOUNTDALE AVE	THUNDER BAY	P7E 6E5	Liquid Fuel Single Wall UST
IMPERIAL OIL ATTN: DEBBIE OSTRIDGE	330005	5360679	645 MOUNTDALE AVE	THUNDER BAY	P7E 6E5	Liquid Fuel Single Wall UST
IMPERIAL OIL ATTN: DEBBIE OSTRIDGE	330005	5360679	645 MOUNTDALE AVE	THUNDER BAY	P7E 6E5	Liquid Fuel Single Wall UST
JOHN TRONSEN ESSO	332941	5361123	1315 ARTHUR ST E	THUNDER BAY	P7E 5N3	Liquid Fuel Single Wall UST
JOHN TRONSEN ESSO	332941	5361123	1315 ARTHUR ST E	THUNDER BAY	P7E 5N3	Liquid Fuel Single Wall UST
JOHN TRONSEN ESSO	332941	5361123	1315 ARTHUR ST E	THUNDER BAY	P7E 5N3	Liquid Fuel Single Wall UST
ABITIBI MISSION ABITIBI PRICE INC FORT WILLIAM DIVISION	335567	5356690	1735 CITY RD	THUNDER BAY	P7C 4Z2	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS SHELL CANADA PRODUCTS	329437	5361141	760 WEST ARTHUR ST	THUNDER BAY	P7E 5R9	Liquid Fuel Single Wall UST
IMPERIAL OIL ATTN: DEBBIE OSTRIDGE			433 HWY 527	THUNDER BAY		Liquid Fuel Single Wall UST
IMPERIAL OIL ATTN: DEBBIE OSTRIDGE			433 HWY 527	THUNDER BAY		Liquid Fuel Single Wall UST
FORT WILLIAM COUNTRY CLUB LTD	328140	5354643	1350 MOUNTAIN RD	THUNDER BAY	P7J 1C2	Liquid Fuel Single Wall UST
ARNONE TRANSPORT LTD	335414	5366338	300 SOUTH WATER ST	THUNDER BAY	P7B 6P6	Liquid Fuel Single Wall UST
ARNONE TRANSPORT LTD	335414	5366338	300 SOUTH WATER ST	THUNDER BAY	P7B 6P6	Liquid Fuel Single Wall UST
K & A VARIETY & RESTAURANT			LOT 52 CITY RD RR 4	THUNDER BAY	P7C 4Z2	Liquid Fuel Double Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
K & A VARIETY & RESTAURANT			LOT 52 CITY RD RR 4	THUNDER BAY	P7C 4Z2	Liquid Fuel Double Wall UST
K & A VARIETY & RESTAURANT			LOT 52 CITY RD RR 4	THUNDER BAY	P7C 4Z2	Liquid Fuel Double Wall UST
WEST ARTHUR VARIETY & VIDEO	324609	5361289	2236 WEST ARTHUR ST	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
WEST ARTHUR VARIETY & VIDEO	324609	5361289	2236 WEST ARTHUR ST	THUNDER BAY	P7C 4V1	Liquid Fuel Single Wall UST
1191154 ONTARIO INC O/A JUNOT BEAVER	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
1191154 ONTARIO INC O/A JUNOT BEAVER	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
1191154 ONTARIO INC O/A JUNOT BEAVER	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
1191154 ONTARIO INC O/A JUNOT BEAVER	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
1191154 ONTARIO INC O/A JUNOT BEAVER	333676	5368550	914 RED RIVER RD	THUNDER BAY	P7B 1K4	Liquid Fuel Single Wall UST
FOR US FUELS			221-223 HWY 61B CHIPPEWA RD	THUNDER BAY	P7C 4Z2	Liquid Fuel Single Wall UST
THUNDER BAY AIRPARK LTD	329415	5360287	1475 WALSH ST W	THUNDER BAY	P7E 4X6	Liquid Fuel Single Wall UST
THUNDER BAY AIRPARK LTD	329415	5360287	1475 WALSH ST W	THUNDER BAY	P7E 4X6	Liquid Fuel Single Wall UST
THUNDER BAY AIRPARK LTD	329415	5360287	1475 WALSH ST W	THUNDER BAY	P7E 4X6	Liquid Fuel Single Wall UST
WESTFAIR PROPERTIES LTD ATTN: BRIAN MAGDEE			970 MEMORIAL AVE	THUNDER BAY	P7B 4A2	Liquid Fuel Single Wall UST
WESTFAIR PROPERTIES LTD ATTN: BRIAN MAGDEE			970 MEMORIAL AVE	THUNDER BAY	P7B 4A2	Liquid Fuel Single Wall UST
WESTFAIR PROPERTIES LTD ATTN: BRIAN MAGDEE			970 MEMORIAL AVE	THUNDER BAY	P7B 4A2	Liquid Fuel Single Wall UST
WESTFAIR PROPERTIES LTD ATTN: BRIAN MAGDEE			970 MEMORIAL AVE	THUNDER BAY	P7B 4A2	Liquid Fuel Single Wall UST
WEST ARTHUR SHELL 948993 ONT INC	329198	5361161	1110 ARTHUR ST W	THUNDER BAY	P7E 6P9	Liquid Fuel Single Wall UST
WEST ARTHUR SHELL 948993 ONT INC	329198	5361161	1110 ARTHUR ST W	THUNDER BAY	P7E 6P9	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	331853	5360426	640 WATERLOO ST S	THUNDER BAY	P7E 2C5	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	331853	5360426	640 WATERLOO ST S	THUNDER BAY	P7E 2C5	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	331853	5360426	640 WATERLOO ST S	THUNDER BAY	P7E 2C5	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
MAC'S CONVENIENCE STORES INC	331853	5360426	640 WATERLOO ST S	THUNDER BAY	P7E 2C5	Liquid Fuel Single Wall UST
MINISTRY OF NATURAL RESOURCES			CURRENT RIVER	THUNDER BAY		Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			1050 LITHIUM DR	THUNDER BAY	P7B 6G3	Liquid Fuel Single Wall UST
CORP OF THE CITY OF THUNDER BAY ATTN JIM SUFFAK, SUPERVISOR FLEET ADMINISTRATION			1050 LITHIUM DR	THUNDER BAY	P7B 6G3	Liquid Fuel Single Wall UST
PETRO CANADA WHOLESALE MARKETING ATT: LYDIA CHIPPER- PETROPASS (ACCTS MGR)	329996	5360199	910 COMMERCE ST	THUNDER BAY	P7E 6E9	Liquid Fuel Single Wall UST
PETRO CANADA WHOLESALE MARKETING ATT: LYDIA CHIPPER- PETROPASS (ACCTS MGR)	329996	5360199	910 COMMERCE ST	THUNDER BAY	P7E 6E9	Liquid Fuel Single Wall UST
PETRO CANADA WHOLESALE MARKETING ATT: LYDIA CHIPPER- PETROPASS (ACCTS MGR)	329996	5360199	910 COMMERCE ST	THUNDER BAY	P7E 6E9	Liquid Fuel Single Wall UST
PETRO CANADA WHOLESALE MARKETING ATT: LYDIA CHIPPER- PETROPASS (ACCTS MGR)	329996	5360199	910 COMMERCE ST	THUNDER BAY	P7E 6E9	Liquid Fuel Single Wall UST
TUNER BUS LINES LTD	329609	5360230	1220 COMMERCE ST	THUNDER BAY	P7E 6E9	Liquid Fuel Single Wall UST
MIKUS FUELS 1468161 ONTARIO LTD	329572	5360430	1401 WALSH ST W	THUNDER BAY	P7E 4X6	Liquid Fuel Single Wall UST
MIKUS FUELS 1468161 ONTARIO LTD	329572	5360430	1401 WALSH ST W	THUNDER BAY	P7E 4X6	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LIMITED	336716	5367917	277 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4N7	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LIMITED	336716	5367917	277 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4N7	Liquid Fuel Single Wall UST
SHELL CANADA PRODUCTS LIMITED	336716	5367917	277 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4N7	Liquid Fuel Single Wall UST
BELL CANADA BUILDINGS MANAGER	329999	5361002	605 BEAVERHALL PL	THUNDER BAY	P7E 3N1	Liquid Fuel Single Wall UST
NEWBOLDS SERVICE CENTRE	335340	5366465	221 BAY ST	THUNDER BAY	P7B 1R1	Liquid Fuel Single Wall UST
NEWBOLDS SERVICE CENTRE	335340	5366465	221 BAY ST	THUNDER BAY	P7B 1R1	Liquid Fuel Single Wall UST
NEWBOLDS SERVICE CENTRE			221 BAY ST	THUNDER BAY	P7B 1R1	Liquid Fuel Single Wall UST
HUSKY LAKESIDE	337621	5368670	514 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4S1	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
HUSKY LAKESIDE	337621	5368670	514 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4S1	Liquid Fuel Single Wall UST
HUSKY LAKESIDE	337621	5368670	514 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4S1	Liquid Fuel Single Wall UST
PAUL MORTON	331119	5361183	147 ARTHUR ST W	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
PAUL MORTON	331119	5361183	147 ARTHUR ST W	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
PAUL MORTON	331119	5361183	147 ARTHUR ST W	THUNDER BAY	P7E 5P7	Liquid Fuel Single Wall UST
ORR'S PLACE			SITE 11	THUNDER BAY	P7B 6B3	Liquid Fuel Single Wall UST
1333429 ONTAIRO LIMITED O/A WARDROPE VILLAGE MARKET	334327	5370285	336 WARDROPE AVE	THUNDER BAY	P7B 5N1	Liquid Fuel Single Wall UST
1333429 ONTAIRO LIMITED O/A WARDROPE VILLAGE MARKET	334327	5370285	336 WARDROPE AVE	THUNDER BAY	P7B 5N1	Liquid Fuel Single Wall UST
NORTH CUMBERLAND ESSO			294 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4N8	Liquid Fuel Single Wall UST
NORTH CUMBERLAND ESSO			294 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4N8	Liquid Fuel Single Wall UST
NORTH CUMBERLAND ESSO			294 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4N8	Liquid Fuel Single Wall UST
NORTH CUMBERLAND ESSO			294 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4N8	Liquid Fuel Single Wall UST
RAYMOR FOODS LTD			601 WEST ARTHUR ST	THUNDER BAY	P7E 5R6	Liquid Fuel Single Wall UST
RAYMOR FOODS LTD			601 WEST ARTHUR ST	THUNDER BAY	P7E 5R6	Liquid Fuel Single Wall UST
HODDER AVE SHELL			480 HODDER AV	THUNDER BAY	P7A 1T8	Liquid Fuel Single Wall UST
HODDER AVE SHELL			480 HODDER AV	THUNDER BAY	P7A 1T8	Liquid Fuel Single Wall UST
HODDER AVE SHELL			480 HODDER AV	THUNDER BAY	P7A 1T8	Liquid Fuel Single Wall UST
HODDER AVE SHELL			480 HODDER AV	THUNDER BAY	P7A 1T8	Liquid Fuel Single Wall UST
CANGO INC**	334169	5364086	808 FORT WILLIAM RD	THUNDER BAY	P7B 3A3	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
CANGO INC**	334169	5364086	808 FORT WILLIAM RD	THUNDER BAY	P7B 3A3	Liquid Fuel Single Wall UST
CANGO INC**	334169	5364086	808 FORT WILLIAM RD	THUNDER BAY	P7B 3A3	Liquid Fuel Single Wall UST
CANGO INC**	334169	5364086	808 FORT WILLIAM RD	THUNDER BAY	P7B 3A3	Liquid Fuel Single Wall UST
GOLDEN HORSESHOE GENERAL STORE ATTN TIMOTHY LOWES	326270	5365274	2225 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
GOLDEN HORSESHOE GENERAL STORE ATTN TIMOTHY LOWES	326270	5365274	2225 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
GOLDEN HORSESHOE GENERAL STORE ATTN TIMOTHY LOWES	326270	5365274	2225 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
GOLDEN HORSESHOE GENERAL STORE ATTN TIMOTHY LOWES	326270	5365274	2225 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
1065447 ONTARIO LIMITED O/A VARIETY PLUS			190 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4M8	Liquid Fuel Single Wall UST
1065447 ONTARIO LIMITED O/A VARIETY PLUS			190 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4M8	Liquid Fuel Single Wall UST
1065447 ONTARIO LIMITED O/A VARIETY PLUS			190 NORTH CUMBERLAND ST	THUNDER BAY	P7A 4M8	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	332671	5369447	1186 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	332671	5369447	1186 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	332671	5369447	1186 DAWSON RD	THUNDER BAY	P7B 5E3	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT			340 MAY ST	THUNDER BAY	P0G 1G0	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT			340 MAY ST	THUNDER BAY	P0G 1G0	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT			340 MAY ST	THUNDER BAY	P0G 1G0	Liquid Fuel Single Wall UST
7-ELEVEN CANADA INC - NATIONAL GAS DEPT			340 MAY ST	THUNDER BAY	P0G 1G0	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	335456	5368252	3 BALSAM ST	THUNDER BAY	P7A 5M6	Liquid Fuel Single Wall UST
MAC'S CONVENIENCE STORES INC	335456	5368252	3 BALSAM ST	THUNDER BAY	P7A 5M6	Liquid Fuel Single Wall UST

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CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
MAC'S CONVENIENCE STORES INC	335456	5368252	3 BALSAM ST	THUNDER BAY	P7A 5M6	Liquid Fuel Single Wall UST
ESSO CITY CENTRE CAR WASH	333918	5364715	740 MEMORIAL AV	THUNDER BAY	P7B 3Z5	Liquid Fuel Single Wall UST
ESSO CITY CENTRE CAR WASH	333918	5364715	740 MEMORIAL AV	THUNDER BAY	P7B 3Z5	Liquid Fuel Single Wall UST
ESSO CITY CENTRE CAR WASH	333918	5364715	740 MEMORIAL AV	THUNDER BAY	P7B 3Z5	Liquid Fuel Single Wall UST
ESSO CITY CENTRE CAR WASH	333918	5364715	740 MEMORIAL AV	THUNDER BAY	P7B 3Z5	Liquid Fuel Single Wall UST
GARRY'S AUTOMOTIVE	331607	5359408	195 EAST FREDERICA ST	THUNDER BAY	P7E 3V4	Liquid Fuel Single Wall UST
GARRY'S AUTOMOTIVE	331607	5359408	195 EAST FREDERICA ST	THUNDER BAY	P7E 3V4	Liquid Fuel Single Wall UST
ULTRAMAR CANADA INC NORTHERN ONTARIO DIVISION	330204	5365209	1419 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
ULTRAMAR CANADA INC NORTHERN ONTARIO DIVISION	330204	5365209	1419 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
ULTRAMAR CANADA INC NORTHERN ONTARIO DIVISION	330204	5365209	1419 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
ULTRAMAR CANADA INC NORTHERN ONTARIO DIVISION	330204	5365209	1419 OLIVER RD	THUNDER BAY	P7B 6C2	Liquid Fuel Single Wall UST
WESTSIDE ESSO	329932	5361222	645 WEST ARTHUR ST	THUNDER BAY	P7E 5R6	Liquid Fuel Single Wall UST
WESTSIDE ESSO	329932	5361222	645 WEST ARTHUR ST	THUNDER BAY	P7E 5R6	Liquid Fuel Single Wall UST
WESTSIDE ESSO	329932	5361222	645 WEST ARTHUR ST	THUNDER BAY	P7E 5R6	Liquid Fuel Single Wall UST
ARTHUR E ROSS ARTS JUNCTION			3046 HWY 61	THUNDER BAY	P7C 5V5	Liquid Fuel Single Wall UST
ARTHUR E ROSS ARTS JUNCTION			3046 HWY 61	THUNDER BAY	P7C 5V5	Liquid Fuel Single Wall UST
WILFS SERVICE CENTRE	333561	5366902	295 SOUTH EMPRESS AV	THUNDER BAY	P7B 4P3	Liquid Fuel Single Wall UST
WILFS SERVICE CENTRE	333561	5366902	295 SOUTH EMPRESS AV	THUNDER BAY	P7B 4P3	Liquid Fuel Single Wall UST
WILFS SERVICE CENTRE	333561	5366902	295 SOUTH EMPRESS AV	THUNDER BAY	P7B 4P3	Liquid Fuel Single Wall UST
RONALD W LONG ENTERPRISES LTD	333758	5363452	1160 MEMORIAL AVE	THUNDER BAY	P7B 5K5	Liquid Fuel Single Wall UST
RONALD W LONG ENTERPRISES LTD	333758	5363452	1160 MEMORIAL AVE	THUNDER BAY	P7B 5K5	Liquid Fuel Single Wall UST

Table H-2
Thunder Bay - TSSA Database

CLIENT NAME	Easting	Northing	STREET NO AND NAME	SITE CITY TOWN	SITE POSTAL CODE	FS TANK TYPE
JOHN GRAVESON SR				THUNDER BAY ONT	P7C 5N5	Liquid Fuel Single Wall UST

Table H-3
MOE Waste Disposal Sites

Site Number	Municipality	Easting	Northing	Status
Active Landfill Locations				
A590101	Thunder Bay	339600	5369300	Active
A590106	Thunder Bay	323400	5367500	Active
A590107	Thunder Bay	335450	5359820	Active
A590111	Thunder Bay	331000	5357450	Active
A590128	Thunder Bay	329800	5358250	Active
A590129	Thunder Bay	337700	5368150	Active
A590134	Thunder Bay	335450	5357150	Active
A590137	Thunder Bay	339550	5370050	Active
A590402	Conmee	307550	5366900	Active
A590501	Gillies	292650	5348800	Active
A590701	Neebing	317550	5335150	Active
A590901	O'Connor	295950	5364150	Active
A591003	Oliver	309050	5364250	Active
A591101	Paipoonge	315450	5358150	Active
A591301	Shuniah	374900	5389550	Active
A591306	Shuniah	350950	5375750	Active
A591601	Dorian	382950	5401200	Active
A7001601	Aldina	280400	5363550	Active
A7005501	Devon	754700	5331200	Active
A7053404	Fowler	315850	5393350	Active
A7078202	Jacques	329450	5391600	Active
A7091201	Lybster	292700	5348800	Active
A7100901	Thunder Bay	329850	5366050	Active
A7138403	Strange	283400	5345100	Active
A7252703	Ware	323800	5387850	Active
A7310903	Gorham	326350	5378450	Active
A7317001	Marks	293350	5359800	Active
Closed Landfill Locations				
A590039	Thunder Bay	334950	5358750	Closed
A590102	Thunder Bay	334600	5362650	Closed
A590104	Thunder Bay	329750	5364300	Closed
A590105	Thunder Bay	335950	5358750	Closed
A590108	Neebing	304790	5336675	Closed
A590109	Thunder Bay	335950	5358750	Closed
A590112	Thunder Bay	334000	5362800	Closed
A590113	Thunder Bay	335340	5362775	Closed
A590130	Thunder Bay	329450	5367550	Closed
A590131	Thunder Bay	335000	5358760	Closed
A590132	Thunder Bay	335950	5358750	Closed
A590135	Marks	290450	5360600	Closed
A590401	Conmee	302460	5369120	Closed
A591001	Oliver	307400	5364500	Closed
A591002	Oliver	315800	5368100	Closed
A591102	Paipoonge	315450	5358300	Closed
A591302	Shuniah	377070	5390350	Closed
A591304	Shuniah	371170	5388800	Closed
A591305	Shuniah	369060	5389775	Closed

Table H-3
MOE Waste Disposal Sites

Site Number	*Municipality*	*Easting*	*Northing*	*Status*
A7053401	Fowler	311100	5393500	Closed
A7053402	Fowler	317000	5393590	Closed
A7053801	Fraleigh	293950	5340550	Closed
A7053802	Fraleigh	292400	5340550	Closed
A7138401	Strange	283800	5346200	Closed
A7138402	Strange	721100	5347200	Closed
A7205201	Neebing	330825	5341700	Closed
A7252701	Ware	316650	5383000	Closed
A7252702	Ware	323620	5388920	Closed
A7310901	Gorham	329000	5388300	Closed
A7310902	Gorham	336210	5384410	Closed
A7446801	Thunder Bay	627750	5692450	Closed
X1201	Conmee	303650	5372900	Closed
X1202	Oliver	306450	5365350	Closed
X1203	Oliver	315000	5368000	Closed
X1204	Paipoonge	319150	5358000	Closed
X1205	Thunder Bay	333950	5362900	Closed
X1206	Thunder Bay	332000	5362000	Closed
X1207	Thunder Bay	331250	5361600	Closed
X1208	Thunder Bay	335300	5362700	Closed
X1209	Thunder Bay	334950	5358750	Closed
X1210	Shuniah	369750	5389550	Closed
X1211	Shuniah	371000	5387000	Closed
X1212	Shuniah	379650	5392550	Closed
X1228	Gillies	799000	5354000	Closed
X1229	Gillies	299150	5353850	Closed
X1259	Fowler	710000	5391000	Closed
X1260	Gorham	329000	5388000	Closed
X1261	Fowler	311150	5393400	Closed
X1262	Fraleigh	293250	5340250	Closed

Table H-4
Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
	15-Dec-88	OLIVER AND PAIPOONGE TOWNSHIP	MTO TRUCK INSPECTION CENTRE ON HWY 17			L	GASOLINE	20	L	TANKER TRUCK			
8906010760	17-Nov-89	OLIVER AND PAIPOONGE TOWNSHIP	KAKABEKA FALLS			L	DIESEL FUEL	450	L	BACKENTRY- HWY ACCIDENT 450 L. DIESEL FUEL TO ROADWAY.	N		
9006010779	7-Aug-90	OLIVER AND PAIPOONGE TOWNSHIP	LOT 8, CONC. 4, R.R. 1, MURILLO (FARM)			L	DIESEL FUEL	900	L	900 LITRES OF DIESEL FUELTO GROUND FROM PRIVATELY OWNED TANK.	P	Soil contamination	100
9006010805	14-Aug-90	OLIVER AND PAIPOONGE TOWNSHIP	HWY 61 AT HWY 130			L	CALCIUM CHLORIDE	22	L	POLLARD: 30 L CALCIUM CHLORIDE TO ROAD	N	Soil contamination	0
@	10-May-91	OLIVER AND PAIPOONGE TOWNSHIP	ON HWY. 130 NEAR THE EXPERIMENTAL FARM ABOUT 10 MILES WEST OF THUNDER BAY			L	LIQUID CALCIUM		UKN	PAIPOONGE TWP PUC - UNKNOWN AMOUNT OF LIQUID CALCIUM TO HWY.	N		0
@	22-Sep-92	OLIVER AND PAIPOONGE TOWNSHIP	R.R. 1 MURILLO AT DON HOARD'S RESIDENCE (935-2601)			A	NATURAL GAS (PIPELINE)		UKN	NATURAL GAS TO AIR FOR 30 MIN. WHEN RESIDENT SEVERED PIPELINE.	N		0
9300010801	16-Sep-93	OLIVER AND PAIPOONGE TOWNSHIP	HWY #588, SOUTH OF HWY #17, 18KMS WEST OF THUNDER BAY, 7KMS SOUTH OF STANLEY V.			LA	GASOLINE	7000	L	CENTRAL CANADA FUELS- 7000 L OF GASOLINE TO HWY# 588 FROM TANK TRUCK.	C	Soil contamination	95
9400000856	28-Jan-94	OLIVER AND PAIPOONGE TOWNSHIP	HIGHWAY 11/17 & COOPER ROAD			L	HYDRAULIC OIL	68	L	ONTARIO HYDRO - 68L HYDRAULIC OIL TO LAND FROM HYDRAULIC BOOM	P	Soil contamination	0
9400012254	11-Nov-94	OLIVER AND PAIPOONGE TOWNSHIP	OLIVER ROAD, IN THE VILLAGE OF MURILLO			L	TRANSFORMER OIL (GT 50 PPM PCB)	10	L	ONT. HYDRO: 5-15 L PCB OIL TO ROAD FROM POLE MOUNTED TRANSFORMER.	P		95
9500006370	30-Jun-95	OLIVER AND PAIPOONGE TOWNSHIP	TRANSFORMER #2325, MAPLE ST, ROSSLYNN VILLAGE			L	TRANSFORMER OIL	9	L	ONTARIO HYDRO-9L TRANSF OIL TO GND. NO PCB'S. NO WATERWAYS.ONT HYD CLEANED	P	Soil contamination	
9600000350	15-Jan-96	OLIVER AND PAIPOONGE TOWNSHIP	KAKABEKA FALLS GENERATING STATION			L	TRANSFORMER OIL	113	L	KEKABEKA GEN. STN: 113 L TRANSFORMER OIL SPILL (<50 PPM): CLEANED UP	C	Soil contamination	99
9600001349	9-Feb-96	OLIVER AND PAIPOONGE TOWNSHIP	ON HWY. 61 AT HWY. 130			L	DIESEL FUEL	865	L	MONSON TRUCKING - 865 L OF DIESEL FUEL TO HWY. FROM SADDLE TANKS.	C	Soil contamination	0
9600003137	20-Apr-96	OLIVER AND PAIPOONGE TOWNSHIP	IN A DITCH AT THE CORNER OF MCLAIN AVE. & HUGHES ST. IN MURILLO			L	USED MOTOR OIL	45	L	ROBINE TRUCKING-45 LITERSUSED MOTOR OIL TO GRND & DITCH,CLEANUP UNDERWAY.	P	Multi Media Pollution	90
9600011978	17-Nov-96	OLIVER AND PAIPOONGE TOWNSHIP	MUD LAKE ROAD			L	TRANSFORMER OIL	8	L	ONTARIO HYDRO-8 LITERS NON-PCB TRANSFORMER OIL TO GRND,WASHED AWAY.	P	Multi Media Pollution	30
9700000331	12-Jan-97	OLIVER AND PAIPOONGE TOWNSHIP	KAMINISTIQUIA RIVER			W	HYDRAULIC OIL	67	L	ONTARIO HYDRO, KAKABEKA FALLS G.S.-67 L HYDRAULICOIL TO KAMINISTIQUIA RIV.	P	Water course or lake	0
9700000414	15-Jan-97	OLIVER AND PAIPOONGE TOWNSHIP	ON HWY. 17 JUST WEST OF KAKABEKA FALLS			L	FURNACE OIL		UKN	PETRO-CANADA - FURNACE OIL TO GROUND FROM OVER- TURNED PUP TRAILER.	P	Other	0
9700012050	16-Oct-97	OLIVER AND PAIPOONGE TOWNSHIP	TOWNLINE RD, POLE LINE RD & 15 TH SIDE RD.			L	MANURE		UKN	FARM-CHICKEN MANURE SPILLALONG 3 ROADS, EQUIPMENT FAILURE, OPP.	C	Soil contamination	0
9700014593	19-Dec-97	OLIVER AND PAIPOONGE TOWNSHIP	LAKE SUPERIOR, KAMINISTIQUIA RIVER, KAKABEKA FALLS GENERATING STATION			W	LUBRICANT OIL(LUBE OIL)	2	L	ONTARIO HYDRO - 2L LUBE OIL TO FLOOR DRAIN/RIVER CLEANED UP.	P	Water course or lake	50
9900007389	28-Jul-99	OLIVER AND PAIPOONGE TOWNSHIP	4123 OLIVER RD			L	TRANSFORMER OIL	20	L	ONTARIO HYDRO: 20 L TRANSFORMER OIL SPILLED TO GROUND.	C	Soil contamination	0
9900008966	7-Sep-99	OLIVER AND PAIPOONGE TOWNSHIP	KAMINISTIQUIA RIVER			WL	HYDRAULIC OIL	30	L	ONTARIO HYDRO, KAKABEKA FALLS G.S.-7 L HYDRAULIC OIL TO KAMINISTIQUIA RIV	P	Water course or lake	0
9900011783	29-Nov-99	OLIVER AND PAIPOONGE TOWNSHIP	THE TRADING POST, P.O. BOX 269, KAKABEKA FALLS			L	DIESEL FUEL	30	L	SERVICE STATION: 30 L DIESEL SPILL TO GROUND DUE TO CUSTOMER ERROR.	P	Soil contamination	50
9900017981	2-Jun-00	OLIVER AND PAIPOONGE TOWNSHIP	KAKABEKA HYDRO ELECTRIC STATION			W	OIL (PETROLEUM BASED, NOT SPECIFIED)	10	L	ONTARIO POWER: 10 LITRES LUBE OIL TO KAMINISTIQUIARIVER.OVER HEATED BEARING	N		0
9900028386	19-Dec-00	OLIVER PAIPOONGE MUNICIPALITY	HIGHWAY 11/17 NEAR LUNDSTROM ROAD @NEAR KAKABEKA FALLS			WL	DIESEL FUEL	800	L	MOTOR VEHICLE ACCIDENT: 800L DIESEL FUEL TO DITCH & ROAD, TRUCK HIT MOOSE	P	Water course or lake	0
9900033958	9-Apr-01	OLIVER PAIPOONGE MUNICIPALITY	119 GARDNER ROAD AT HYDRO-1 YARD			L	TRANSFORMER OIL (N.O.S.)	100	L	HYDRO ONE- 100L NON PCB MINERAL OIL TO GRAVEL, CLEANING.	P	Soil contamination	0
9900054925	9-Jan-02	OLIVER PAIPOONGE MUNICIPALITY	HWY # 69 NEAR US BORDER CROSSING AT CANADA CUSTOMS PROPERTY, PAIPOONGE.			L	DIESEL FUEL	9	L	SOURCE UNKNOWN-9 L DIESELFOUND ONTO GRND AT CANADACUSTOMS, CLEANED UP.	N		98
@	3-Oct-91	SHUNIAH TWP.	TCPL COMPRESSOR STN. #68 NEAR 527 HIGHWAY			L	MINERAL OIL (LT 50 PPM PCB)	45	L	TRANSCANADA PIPELINES: 45 L MINERAL OIL TO GRONDWHEN TANK OVER-FILLED	C	Soil Contamination	100
9300002364	17-Mar-93	SHUNIAH TWP.	COMPRESSOR STATION RD			L	MINERAL OIL	110	L	TRANSCANADA PIPELINES - 110 L OF MINERAL OIL TO GROUND	C	Soil contamination	95
9300002576	24-Mar-93	SHUNIAH TWP.	MACKENZIE BEACH ROAD			L	HYDRAULIC OIL	10	L	ONTARIO HYDRO-10L OF HYD-RAULIC OIL TO GROUND, CONTAINED, CLEANED.	P	Soil contamination	90
9400005416	27-May-94	SHUNIAH TWP.	LAMBERT ISLAND,LOT 11.			L	FURNACE OIL		UKN	PRIVATE OWNER-UNK QTY FURNACE OIL TO GRND,LINE FAILED,CLEANUP ONGOING.	P	Soil contamination	0
9400013024	8-Dec-94	SHUNIAH TWP.	COPENHAGEN ROAD			L	FURNACE OIL	1198	L	MCDONALD'S FUEL-TANK TRUCK OVERTURN,FURNACE OIL TO DITCH.	P	Multi Media Pollution	0
9700000305	10-Jan-97	SHUNIAH TWP.	ON HWY #527			LW	DIESEL FUEL	80	L	MTO-80L OF DIESEL TO CB AS RESULT OF FIRE.	P	Water course or lake	100
9900009171	13-Sep-99	SHUNIAH TWP.	11 KM WEST OF PASS LAKE.			L	DIESEL FUEL		UKN	TRANSPORT TRUCK-UKN QTY DIESEL FUEL TO DITCH,OPP,FD,MTO.	P	Multi Media Pollution	0
9900042598	25-Jul-01	SHUNIAH TWP.	INTERSECTION OF HWY 527 & HWY 11/17			L	DIESEL FUEL	380	L	MOLSON: 380 L DIESEL TO DRY DITCH. CONTAINED IN DITCH. CLEANING. MVA. OPP	P	Soil contamination	0

Table H-4
Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9900049730	18-Oct-01	SHUNIAH TWP.	CP RAIL, MILE 119 NEAR MACKENZIE TO MILE 128 NEAR NAVILUS, EAST THUNDER BAY			L	DIESEL FUEL	45	L	CP RAIL LINE, DIESEL LEAK FROM ENGINE, 45L OVER 15KM, CP ENVIRO RESPONDING	P	Soil contamination	0
@	21-Sep-92	NEEBING TWP.	LAKE SUPERIOR			W	LUBRICATING OIL/GREASE	10	L	CONTRACTOR -10L LUBRICA- TING OIL FROM BACKHOE TO LAKE SUPERIOR. CLEANED UP	N	Water course or lake	99
9400011408	18-Oct-94	NEEBING TWP.				L	FURNACE OIL	675	L	RESIDENT - 675 L OF FURNACE OIL TO GROUND FROM STORAGE TANK.	C	Soil contamination	0
9900031978	4-Mar-01	NEEBING MUNICIPALITY	HIGHWAY 61, 4 KILOMETERS NORTH OF PIGEON RIVER CROSSING			LW	DIESEL FUEL		UNK	MOTOR VEHICLE ACCIDENT:NO DANGEROUS GOODS, UNKNOWN AMOUNT DIESEL TO DITCH	P	Water course or lake	0
9006010958	10-Aug-90	CONMEE TWP.				L	FURNACE OIL	5	L	FURNACE TANK- 5 L OIL TO GROUND.	C	Soil contamination	0
9400006121	13-Jun-94	CONMEE TWP.	SOUTH HALF OF LOT 6 CONCESSION 4, MOKOMON ROAD			L	DIESEL FUEL		UKN	UKN AMT OF DIESEL TO LAND:SUSPECT TRANSPORT TRUCK IEB INVESTIGATING	C	Soil contamination	0
9900007202	23-Jul-99	CONMEE TWP.	LOT 1, CONC 3/R R # 1, KAKABEKA FALLS.			L	FURNACE OIL	800	L	PRIVATE RESIDENCE-800 L FURNACE OIL ONTO GROUND, TK DAMAGED BY TREE/STORM.	C	Soil contamination	100
@		THUNDER BAY CITY				L	PETROLEUM OIL (N.O.S.)	15	L	BACKENTRY - ONTARIO HYDRO15L WASTE OIL TO LAKE SUPERIOR	N		100
@	11-Feb-88	THUNDER BAY CITY	483 EAST MARY ST.	332843	5359851	L	FURNACE OIL	5	GAL	25 LTR. HEATING OIL TO GROUND DURING DELIVERY AT RESIDENCE.	N		
@	13-Feb-88	THUNDER BAY CITY				L	FURNACE OIL	5	L	5L HOME HEATING OIL SPILLED TO DRIVEWAY.			
@	11-Mar-88	THUNDER BAY CITY	205 BURWOOD RD			L	MINERAL OIL (LT 50 PPM PCB)	< 1	L	ONTARIO HYDRO-< 1 LITER MINERAL OIL (< 50 PPM) FROM RECLOSURE.			
@	16-Mar-88	THUNDER BAY CITY	CN YARD AT FUEL STATION			L	DIESEL FUEL	900	L	CN RAIL- 900 L OF DIESEL FUEL TO GROUND AT FUEL STATION IN YARD.			
@	19-Mar-88	THUNDER BAY CITY				A	ASH			ONT HYDRO - ASH TO ATM 8 HRS (60% OPACITY).			
@	23-Mar-88	THUNDER BAY CITY	645 MOUNTDALE AVE.	330006	5360686	L	DIESEL FUEL	225	L	DITMAR FUELS- 225 L OF DIESEL TO YARD & DITCH.	N	VEGETATION	
@	30-Mar-88	THUNDER BAY CITY	KAM RIVER			W	PETROLEUM OIL (N.O.S.)			PETROLEUM PRODUCT IN KAM RIVER - CPR SEPARATOR OVERFLOW SUSPECTED			
@	30-Mar-88	THUNDER BAY CITY				L	DIESEL FUEL	2700	L	DAWSON ROAD TRUCK STOP - 800 L DIESEL TO GROUND		SOIL CONTAMINATION	
@	6-Apr-88	THUNDER BAY CITY	HWY #61, CITY LIMITS, WHEELERS AND MOSQUITO CREEK			LW	DIESEL FUEL	450	L	SFS TRUCK SALES - 450 LITRES DIESEL TO ROAD ANDMOSQUITO CREEK.			10
@	11-Apr-88	THUNDER BAY CITY	UPSALA			W	GASOLINE	600	L	MNR UPSALA SUB-STATION - 600 L GASOLINE TO LAND AND DITCH FROM TANK.			
@	13-Apr-88	THUNDER BAY CITY	LONGLAC - KENOGAM1 LIFT STATION, STP			L	SEWAGE	UNKNOWN		SEWAGE TREATMENT PLANT WATER BUILD-UP ON THE FLOOR FOR 2HRS.			
@	16-Apr-88	THUNDER BAY CITY	ON CP TRACK IN FRONT OF 235 HARDISTY ST.	334177	5361655	L	PAINT OR PAINT RELATED N.O.S.	SMALL		CP RAILWAYS - PAINTS LEAKFROM BOXCAR SOLIDIFYING AT THE SEAM.			
@	1-May-88	THUNDER BAY CITY	THUNDER BAY HARBOUR			W	PETROLEUM OIL (N.O.S.)	UNKNOWN		CANADIAN COAST GUARD - REPORTING OIL ON THUNDER BAY HARBOUR.			
@	27-Jun-88	THUNDER BAY CITY	HARBOUR, SOUTH ENTRANCE, KEEFER TERMINAL& KAM RIVER ENTRANCE			W	PETROLEUM OIL (N.O.S.)			CREOSOTE/OIL SIGHTED IN THUNDER BAY HARBOUR			
@	13-Jul-88	THUNDER BAY DISTRICT	FORBES TWP, LOT 10, CONC. 3			L	TRANSFORMER OIL (N.O.S.)	1	L	ONTARIO HYDRO 1 LITRE TRANSFORMER OIL TO LAND FROM FAILED TRANSFORMER.			
@	14-Jul-88	THUNDER BAY CITY				A	CHLORINE (COMPRESSED GAS)	UNKNOWN		GREAT LAKES FOREST PRODUCTS - UNKNOWN QTY CHLORINE TO ATM.	P		0
@	18-Jul-88	THUNDER BAY DISTRICT	CROOKS TWP, MEMORY LODGES ROAD NEAR HWY #61			L	MINERAL OIL (LT 50 PPM PCB)	60	L	ONTARIO HYDRO - 60 LITRESTRANSFORMER OIL TO LAND FROM FAILED TRANSFORMER.			
@	25-Jul-88	THUNDER BAY CITY	TEXACO BULK STATION			L	FURNACE OIL	5000	L	TEXACO-5000 L FURNACE OILTO CONTAINED AREA			
@	4-Aug-88	THUNDER BAY CITY	LAKE SUPERIOR			W	PETROLEUM OIL (N.O.S.)			OIL SLICK IN LAKE SUPERIOR - UNKNOWN SOURCE			
@	9-Aug-88	THUNDER BAY CITY	SHELL CAR WASH, THUNDER BAY MALL ON ARTHUR ST.			L	GASOLINE	2	L.	SHELL CANADA TANK TRUCK OPERATOR - GASOLINE, 2 L.TO GROUND AT A CAR WASH.			
@	27-Aug-88	THUNDER BAY CITY	165 TIMERLINE DR.	332388	5367926	L	MINERAL OIL (LT 50 PPM PCB)	9	L	THUNDER BAY HYDRO - 9 L TRANSFORMER TO GROUND.	N		100
@	28-Aug-88	THUNDER BAY CITY	JOHN ST., EN ROUTE TO LANDFILL			L	FIBERGLASS INSULATION (N.O.S.)	UNKNOWN		GMGH HOMES LTD. - FIBER- GLASS ON TRUCKS BLOWING ONTO FIELDS.			
@	13-Sep-88	THUNDER BAY CITY	HWY 17, 2KM. EAST OF SCHREIBER AT PAYS- FLATS			L	PAINT OR PAINT RELATED N.O.S.			CLAIRA INDUSTRIES - PAINT & PAINT THINNERS TOHIGHWAY, ACCIDENT.	N		
@	17-Sep-88	THUNDER BAY CITY	BELMORAL ST. EXTENSION, JUST WEST OF BRIDGE			W	DIESEL FUEL	UNKNOWN		DIESEL FUEL TO SEWERS & MCINTYRE RIVER-UNKNOWN SOURCE			
@	17-Sep-88	THUNDER BAY CITY	SOUTH SIDE OF RIVER STREET, FROM RIVER &JUNOT TO ROCKWOOD			L	PETROLEUM OIL (N.O.S.)	UNKNOWN		OIL TO ROAD			
@	24-Sep-88	THUNDER BAY CITY				W	CHLORINE (COMPRESSED GAS)	1	KG	ABITIBI-PRICE - 1 KG CHLORINE TO COMPANY'S WATER TREATMENT SYSTEM.			

Table H-4
Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
@	6-Oct-88	THUNDER BAY CITY	ABITIBI MISSION MILL OFF CITY ROAD			A	SODIUM DITHIONITE	11	KG	ABITIBI MISSION MILL-FIRE INVOLVING SODIUM DITHIONITE IN PLANT			
@	28-Oct-88	THUNDER BAY CITY				W	DIESEL FUEL	2	L	BACKENTRY - VOLUME TANK TRUCK IN RIVER. 2L FUEL SPILLED.	N		100
@	12-Nov-88	THUNDER BAY CITY	WEST END OF WESTFORD YARD			L	LUBRICATING OIL/GREASE	300	L	C.P. RAIL-300 L LUBRICATING OIL TO GROUND			
@	14-Nov-88	THUNDER BAY CITY	1120 JOHN ST	332434	5368243	LW	GASOLINE	100	L	TEXACO - 100 L GASOLINE TO GROUND AND SEWERS.			
@	22-Nov-88	THUNDER BAY CITY	LAKEHEAD'S FREIGHWAYS 774 FIELD ST. 807-345-6501			L	DIESEL FUEL	MAX 150	L.	CP TRANSPORT TANKER TRUCKSPILL OF MAX 150 L., DIESEL FUEL TO GROUND.			
@	28-Nov-88	THUNDER BAY CITY	857 DETROIT AVE	336422	5369652	L	FURNACE OIL	10-20	L	BACKENTRY - ESSO 10-20L FURNACE OIL FROM BROKEN HOSE	N		60
@	6-Dec-88	THUNDER BAY CITY	295 EMPRESS AVE.	333560	5366900	L	GASOLINE	4.5	L	SERVICE STATION			
@	12-Dec-88	THUNDER BAY CITY	SHELL SERVICE STATION, 71 SOUTH ALGOMA	335373	5367051	L	GASOLINE	5	L	SERVICE STATION			
@	13-Jan-89	THUNDER BAY CITY	JUNCTIONT OF HWY 11 AND HWY 17			L	DIESEL FUEL	400	L				
@	30-Jan-89	THUNDER BAY CITY	901 RED RIVER RD	333632	5368502	L	WASTE OIL	UNKNOWN		THUNDER BAY- SPILL OF COOKING OIL TO GROUND			
@	15-Feb-89	THUNDER BAY CITY	SELF SERVICE STATION, DAWSON ROAD 807-767-5131			L	GASOLINE	MAX 45	L.	PETRO-CANADA - 45 L. GASOLINE TO GROUND, CUSTOMER ERROR	N		
@	21-Feb-89	THUNDER BAY CITY				L	DIESEL FUEL	176	L	CP RAIL- 176 L DIESEL FUEL TO GROUND.			
8906010042	23-Feb-89	THUNDER BAY CITY	CORRECTIONAL CENTRE PARKING LOT			L	TRANSFORMER OIL (GT 50 PPM PCB)	100	ML	MGS - 100 ML OIL TO PVMT FROM POLE TRANSFORMER. TESTED POSITIVE FOR PCB.	N		100
@	2-Mar-89	THUNDER BAY CITY	147 WEST ARTHUR	331119	5361183	L	GASOLINE	5	L	TEXACO SERVICE STATION- 50 LITRES GASOLINE TO APRON(OPERATING)	N		80
@	12-Mar-89	THUNDER BAY CITY	JCTN HWY 11 & HWY 527			L	DIESEL FUEL	100	L	ARNOLD BROS. -100 L. DIESEL FUEL TO DITCH, OVERTURNED TRUCK.	N	Other	100
@	13-Mar-89	THUNDER BAY CITY	MCKELLAR ISLAND			L	GASOLINE			SHELL-50 L GASOLINE TO LOADING DOCK	N		
@	23-Mar-89	THUNDER BAY CITY	CORNER OF BROWN AND FREDRICA ST.	331019	5359393	L	MINERAL OIL (LT 50 PPM PCB)	40	L	THUNDER BAY HYDRO-40 L MINERAL OIL FROM TRANSFORMER. MARCH 23/89	N		95
@	26-Mar-89	THUNDER BAY CITY	CP-RAIL TRAFFIC YARD			L	GASOLINE	45	L	CP-RAIL -45 L. GASOLINE TO GROUND SHELL TANK CAR.			
@	2-Apr-89	THUNDER BAY CITY	345 ROBERTA ST.	338457	5369514	L	FURNACE OIL	900	L	900 L FURNACE OIL TO GROUND.			
@	3-Apr-89	THUNDER BAY CITY	PORT ARTHUR CN YARD			L	DIESEL FUEL	4050	L	CNR-4050 L DIESEL FUEL TO GROUND			
@	10-Apr-89	THUNDER BAY CITY	368 NORTH CUMBERLAND	336975	5368188	L	GASOLINE	20	L	SHELL SERVICE STN -20 L. GASOLINE TO GROUND.			
@	13-Apr-89	THUNDER BAY CITY	LOADING RACK			L	GASOLINE	50	L	IMPERIAL OIL BULK STN. 50L GASOLINE DUE TO OVER-FILL	N		100
@	17-Apr-89	THUNDER BAY CITY				A	SMOKE			ONTARIO HYDRO THUNDER BAY ONGOING 30% OPACITY EMISSIONS			
@	20-Apr-89	THUNDER BAY CITY	BULK DISTRIBUTION CENTRE			LW	PETROLEUM OIL (N.O.S.)	450000	L	SHELL CAN.- NOTICED BLACKSUBSTANCE OOZING OUT OF DYKE, CONTAINED.	P	Soil contamination	0
@	22-Apr-89	THUNDER BAY CITY	OLD ESSO STATION-OLIVER ROAD LAKE TAMLIN			LW	FURNACE OIL	UNKNOWN		LAKEHEAD UNIVERSITY- FURNACE OIL TO GROUND ANDDIESEL FUEL TO LAKE.			100
@	1-May-89	THUNDER BAY CITY	205 BURWOOD AVE			L	TRANSFORMER OIL (GT 50 PPM PCB)	5	L	THUNDER BAY HYDRO - 5 L PCB-CONTAMINATED OIL TO GROUND.			100
@	8-May-89	THUNDER BAY CITY	MNR OFFICE RR #1 & 25 SIDE ROAD			L	DIESEL FUEL	500	L.	MNR FUEL STORAGE TANK EST 500 LITRES DIESEL TO GROUND.			
@	8-May-89	THUNDER BAY CITY	YARD AT 470 BALMORO ST.	332877	5362315	L	DIESEL FUEL	41	L	KINGSWAY TRANSP. SPILLED 41L OF DIESEL FUEL TO YARD.			
@	15-May-89	THUNDER BAY CITY	399 MEMORIAL AVE.	334630	5365888	L	GASOLINE	2270	L	SUNTRAC RENTALS -GASOLINETO GROUND DUE TO VANDALISM.	N		100
@	26-May-89	THUNDER BAY CITY	DAWSON RD.			L	GASOLINE	2	L	SHELL - 2 LTR GASOLINE TO PVMT DURING DELIVERY AT SERVICE STN.	N		100
@	31-May-89	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	25	L	THUNDER BAY MOE- 25 LTR JET FUEL SPILLED. EPS NO-TIFIED.			
@	2-Jun-89	THUNDER BAY CITY	1020 PACIFIC AVE.	335670	5362706	L	GASOLINE	733	L	IMPERIAL OIL -900 L. GASOLINE TO GROUND.	N		99
@	16-Jun-89	THUNDER BAY CITY	540 HAZELWOOD DR.	331648	5372395	L	GASOLINE	50	L	50 LTR GASOLINE TO GRAVELDRIVEWAY, TRUCK FLIPPED AFTER POLICE CHASE.	P	Soil contamination	
@	20-Jun-89	THUNDER BAY CITY	CO. YARD AT 1090 COMMERCE ST.	329866	5360202	L	DIESEL FUEL	UNKNOWN		TEMBRO CO. YARD - SPILL DIESEL FROM STORED 45 G. DRUMS.			
@	21-Jun-89	THUNDER BAY CITY	REICHOLD LTD			L	SEWAGE SLUDGE	700	L	REICHOLD-ACTIVATED SLUDGETO GROUND			
@	22-Jun-89	THUNDER BAY CITY	901 RED RIVER RD	333632	5368502	L	WASTE OIL	UNKNOWN		THUNDER BAY- SPILL OF COOKING OIL TO GROUND			
@	23-Jun-89	THUNDER BAY CITY	THUNDER BAY DISTRICT PATROL YARD			L	GASOLINE	UNKNOWN		BACKENTRY - UNKNOWN AMT. UNLEADED GASOLINE TO GROUND FROM BURIED TANK.			
@	27-Jun-89	THUNDER BAY CITY	HARBOUR			W	CREOSOTE	UNKNOWN		CCG THUNDER BAY RADIO CREOSOTE SHEEN IN HARBOUROCCURRENCE FINISHED			
@	28-Jun-89	THUNDER BAY CITY	KAM RIVER TO SECOND BOUY, LAKE SUPERIOR.			W	PETROLEUM OIL (N.O.S.)			MARINE VESSEL TRAILING CREOSOTE TYPE OIL . THIN			
@	17-Jul-89	THUNDER BAY CITY	500 W ARTHUR ST	330446	5361113	L	GASOLINE	200	L	BACKENTRY - TEXACO - 200L GASOLINE TO GROUND WHILEFILLING TANK	N		100
@	18-Jul-89	THUNDER BAY CITY	THUNDER BAY COLD TERMINALS, SOUTH END OFHARBOUR, RED BOUY.			W	PETROLEUM OIL (N.O.S.)	UNKNOWN		SARNIA CCG- REPORT OF SLICK FROM THUNDER BAY CCG.			

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Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
@	31-Jul-89	THUNDER BAY CITY	71 SOUTH ALGOMA STREET, MIKE'S MART 344-5161	335373	5367051	L	GASOLINE	15	L	SHELL-TANK TRUCK LOST 15LGASOLINE TO GROUND.			
@	3-Aug-89	THUNDER BAY CITY	AIRPORT #2 APRON			L	KEROSENE (STOVE OIL)	25	L	SHELL AGENT AT AIRPORT 25 LTR JET-A1 TO GROUND			
@	7-Aug-89	THUNDER BAY CITY	DOCK			W	COAL TAR	UK		NORTHERN WOOD PRESERVER- CRESOTE COVERING LARGE AREA OF BAY.			
8906010391	10-Aug-89	THUNDER BAY CITY	LAKE SUPERIOR			W	ACID (N.O.S.)	25000	L	BACKENTRY ABITIBI-COOKING ACID DUMPED TO LAKE SUPERIOR.	P	Water course or lake	0
@	14-Aug-89	THUNDER BAY CITY				L	PHENOLIC RESINS	45	L	BACKENTRY -REICHOLD LTD. -45 L. PHENOL MAT'L TO GROUND.	N		99
@	25-Aug-89	THUNDER BAY CITY	147 WEST ARTHUR STREET	331119	5361183	L	GASOLINE	50	L	TEXACO- 50 LTR GASOLINE SPILLED TO PAVEMENT WHILEUNLOADING SHIPMENT.			
@	28-Aug-89	THUNDER BAY CITY	MTSE GARAGE, 410 MOUNTDALE AVE., CITY OF THUNDER BAY GARAGE			L	WASTE OIL	450	L	BACKENTRY - A-1 SEWAGE: 450L WASTE OIL TO GROUND WHILE PUMPING OUT TANK	N		100
@	29-Aug-89	THUNDER BAY CITY	1226 DAWSON ROAD, PARKING LOT OF AMCO.	332667	5369583	L	DIESEL FUEL	150	L	GORDON TRAILER RENTALS- SADDLE TANK RUPTURE 150 LTR DIESEL FUEL TO GROUND			
@	1-Sep-89	THUNDER BAY CITY	BROCK/HEATH STS			L	MOTOR OIL	20	L	20L MOTOR OIL ON STREET FROM UNKNOWN SOURCE	N		100
@	5-Sep-89	THUNDER BAY CITY	HARBOUR			W	BUNKER FUEL OIL (NO. 4, 5 OR 6)	227	L	VESSEL "ZIEMIA KRAKOWSKA"LOSS OF 230 L. BUNKER C TO HARBOUR.			
@	6-Sep-89	THUNDER BAY CITY	UGG-M SLIP			W	BUNKER FUEL OIL (NO. 4, 5 OR 6)	250	L	VESSEL ZIEMIBA KRAKOWSKA-250 L BUNKER C OIL TO HARBOUR.			
@	8-Sep-89	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	GLUTEN	4500	L	OGILVY MILLS - 4,500 L OF GLUTEN TO THE KAMINISTIQUIA RIVER.	N		100
8906010527	11-Sep-89	THUNDER BAY CITY	RED RIVER TEXACO SERVICE STATION			L	GASOLINE	50	L	BACKENTRY-TEXACO SERV STN-50 L. GASOLINE TO GROUND,CONTAINED AND CLEANED UP	N		100
@	18-Sep-89	THUNDER BAY CITY	TO PUMPING BASIN AND LAGOONS			W	HEXAMETHYLPARAROSANILINE CHLORIDE			ABITIBI-METHYL VIOLET TO LAGOONS	P	Water course or lake	0
8906010624	1-Oct-89	THUNDER BAY CITY				A	CHLORINE (COMPRESSED GAS)	UNKNOWN		ABITIBI-PRICE - MINOR CHLORINE GAS RELEASE TO AIR FOR < 1 MINUTE.	N		
@	2-Oct-89	THUNDER BAY CITY	780 HILLDALE RD.	333475	5372443	L	FURNACE OIL	UNKNOWN		PETRO CANADA - UNKNOWN QTY FURNACE OIL TO GRD.	P	Soil contamination	100
@	11-Oct-89	THUNDER BAY CITY	GOREVILLE RD. AT ONION LAKE RD.	334438	5376002	L	DIESEL FUEL	45	L	RESIDENT -CONCERN FOR GROUNDWATER CONT'N FROM OVERTURNED TRUCK.	N		99
@	6-Nov-89	THUNDER BAY CITY	REICHOLD LTD			L	PHENOLIC RESINS	800	KG	REICHOLD- 800 KG OF LIQUID PHENOLIC RESIN TO GROUND NEAR BLG.	N		
8906010744	9-Nov-89	THUNDER BAY CITY	1020 PACIFIC AV., LOADING RACK	335670	5362706	L	DIESEL FUEL	20	L	BACKENTRY IMPERIAL OIL 20L DIESEL TO GROUND. CLEANED UP.	N		100
@	16-Nov-89	THUNDER BAY CITY	SHELL SITE AT AIRPORT			LA	AVIATION FUEL (JET A OR B, TURBO)	20	L	MAINTAIR AVIATION -20 L. JET A-1 FUEL TO CONCRETE PAD.	N		99
@	18-Nov-89	THUNDER BAY CITY	620 BEAVER HALL PLACE	329877	5360842	L	DIESEL FUEL	1360	L	POWELL EQUIPMENT -1360 L.DIESEL FUEL TO GROUND, CONTAINED.	N		99
8906010803	5-Dec-89	THUNDER BAY CITY	HIGH ST. OPPOSITE HILLCREST PARK			L	HYDRAULIC OIL	MAX 5	L.	BACKENTRY- BROKEN HOSE MAX 5 L. HYDRAULIC OIL TO GROUND	N	Other	
8906010806	8-Dec-89	THUNDER BAY CITY	MCKENZIE HEIGHTS RD., CUSTOMER DRIVEWAY, ZELINSKI RES.			L	HYDRAULIC OIL	MAX 25	L.	BACKENTRY- BROKEN HOSE MAX 25 L. HYDRAULIC OIL TO RESIDENTIAL DRIVEWAY.	P	Other	
@	24-Dec-89	THUNDER BAY CITY	HARBOUR			W	DIESEL FUEL	45	L	POTTER PUMPING -45 L. DIESEL TO HARBOUR ICE WHILE FUELING FREIGHTER.	N		99
9006010002	2-Jan-90	THUNDER BAY CITY	1020 PACIFIC AV., LOADING RACK	335670	5362706	L	GASOLINE	30	L	IMPERIAL OIL-30L GASOLINETO GROUND. CLEANED UP.	N		95
9006010003	4-Jan-90	THUNDER BAY CITY				LW	PA-7M (SULPHITE PULPING AID)	MAX 50	KG	BACKENTRY- ABITIBI PRICE MAX 50 KG OF PA-7M TO SEWER(A SULPHITE PULPING)	P	Water course or lake	
9006010020	15-Jan-90	THUNDER BAY CITY	HARBOUR EXPWY/HWY 11-17			L	DIESEL FUEL	90	L	VEHICLE ACCIDENT - 90 L DIESEL FUEL TO ROADWAY	P	Soil contamination	100
9006010017	19-Jan-90	THUNDER BAY CITY	FORT WILLIAM DIVISION GROUND FROM SCMP UNIT TO BLEACH PLANT			L	MILL WATER	EST.100	L.	BACKENTRY- ABITIBI-PRICE EST. 100 LITRES SO2 WATERTO GROUND.	N		
9006010028	19-Jan-90	THUNDER BAY CITY	JOHN JUMBO REC. CENTRE ON TOIVO ST.	331940	5369290	L	FUEL OIL	<900	L.	BACKENTRY - CITY PARKS & REC. DEPT. < 900 LITRES FUEL OIL TO GROUND.	N		100
8906010769	20-Jan-90	THUNDER BAY CITY	LAKE SUPERIOR / KAMINISTIQUIA RIVER			W	SOAP N.O.S.		UKN	BACKENTRY-CANAD'N PACIFICFOREST PROD. - C.OF A. EXCEEDENCE IN WASTEWATER.	N		
9006010034	24-Jan-90	THUNDER BAY CITY				W	DYE (N.O.S., POISONOUS LIQUID)	2	L	BACKENTRY - ABITIBI-PRICERELEASED 2L LIQUID DYE INTO LAGOON	P	Water course or lake	0
9006010096	28-Feb-90	THUNDER BAY CITY				W	DYE (N.O.S., CORROSIVE)	390	L	BACKENTRY - ABITIBI-PRICE380 LTR 3% DYE SOLUTION TO PLANT SEWER	P	Water course or lake	0
9006010117	28-Feb-90	THUNDER BAY CITY	1 KM WEST ON HWY 17			L	MINERAL OIL (LT 50 PPM PCB)	225	L	ONTARIO HYDRO - 50 L OIL FROM TRANSFORMER TO LAND	P	Soil contamination	100
9006010123	28-Feb-90	THUNDER BAY CITY				W	HYDRAULIC OIL	200	L	ABITIBI-PRICE(FT WILLIAM)200L HYDRAULIC OIL TO MAIN SEWER LAGOON	P	Water course or lake	0
9006010128	5-Mar-90	THUNDER BAY CITY	AT TRIMAC YARD ON ROSSLYN RD			L	DIESEL FUEL	200	L.	BACKENTRY - TRIMAC- EST. 200 LITRES DIESEL FUEL TO GROUND DUE, ERROR	N		

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9006010130	5-Mar-90	THUNDER BAY CITY	WORKS DEPT GARAGE, FORT WILLIAM RD			L	DIESEL FUEL	60	L	DITMAR FUELS: 60L DIESEL FUEL TO DYKED AREA	P	Soil contamination	100
9006010135	7-Mar-90	THUNDER BAY CITY	HUSKY STATION AT ALLOY AND COBALT	333032	5364215	L	DIESEL FUEL	60	L	FITZSIMMONS-50-60 L DIESEL FUEL TO GROUND	N		99
9060100144	11-Mar-90	THUNDER BAY CITY	LAKE SUPERIOR			W	SODIUM BISULFITE	45	L	ABITIBI-PRICE: 45 L COOKING LIQUOR TO LAGOON LATER DISCHARGED TO LAKE	N	Water course or lake	0
9006010177	28-Mar-90	THUNDER BAY CITY	MAPLEWARD, OLIVER, JOHN ST. AND AT LANDFILL SITE			L	SEWAGE SLUDGE	1000	L	TRIMAC TRANSPORT - SPILL OF APPROX. 1000 LTR OF SLUDGE FROM WPCP TO ROAD.	C	Other	
9006010178	28-Mar-90	THUNDER BAY CITY	950 COBALT CRES.	332979	5364268	L	DIESEL FUEL	50	L	HUSKY TRUCK STOP - 50 L OF DIESEL FUEL TO PAVEMENT AT STATION.	N		100
9006010182	30-Mar-90	THUNDER BAY CITY	ONION LAKE SUB-STATION			A	MERCAPTANS N.O.S. (THIOL)	240	MLR	ICG- 0.24 LTR LEAK OF ODOURANT (MERCAPTANS) FROM NATURAL GAS LINE			
9006010191	4-Apr-90	THUNDER BAY CITY	1020 PACIFIC AVE	335670	5362706	L	DIESEL FUEL	10	L	BACKENTRY - ESSO: 10L DIESEL FUEL TO GROUND(TRUCK OVERFILLED)	N		100
9006010307	25-Apr-90	THUNDER BAY CITY	SCRIBBER TERMINAL			L	GASOLINE	500	L	SHELL TANKER TRUCK-500 L GASOLINE TO GROUND.	P	Groundwater pollution	90
9006010312	26-Apr-90	THUNDER BAY CITY	380 HILLDALE RD	333173	5370574	L	HYDRAULIC OIL	23	L	BACKENTRY - THUNDER BAY HYDRO: 23L HYDRAULIC OIL TO GROUND FROM TRUCK	P	Soil contamination	100
9006010499	27-Apr-90	THUNDER BAY CITY	AT TRIMAC YARD ON ROSSLYN ROAD			L	DIESEL FUEL	1000	L.	BACKENTRY - TRIMAC YARD ONGOING PROBLEM, DIESEL FUEL IN THE GROUND.	N		100
9006010033	2-May-90	THUNDER BAY CITY	89 SHIP YARD ROAD			L	DIESEL FUEL	500	L	PORT ARTHUR SHIP BLDG- 500 LTR DIESEL FUEL SPILLED TO GROUND			
9006010332	2-May-90	THUNDER BAY CITY	HAMMARSKJOLD HIGH SCHOOL			L	TRANSFORMER OIL (N.O.S.)	15	L	LAKEHEAD BOARD OF ED. TRANSFORMER-LEAKED TO GROUND.	N		100
9006010368	4-May-90	THUNDER BAY CITY	316 HECTOR DOUGALL WAY (AIRPORT)	328246	5360054	L	AVIATION FUEL (JET A OR B, TURBO)	5	L	MAINTAIR AVIATION - 5 L JET A-1 FUEL TO TARMAC.	N		100
9006010395	11-May-90	THUNDER BAY CITY				L	FURNACE OIL		UKN	BACKENTRY - LARGE AMT. OFFURNACE OIL ON GROUND FROM NEIGHBOURS TANK.	P	Soil contamination	0
9006010401	15-May-90	THUNDER BAY CITY				L	AVIATION FUEL (JET A OR B, TURBO)	15	L	MAINTAIR AIRCRAFT- 15 L JET "A" AVIATION FUEL TO CONCRETE.	N		90
9006010417	21-May-90	THUNDER BAY CITY	82 FRONT STREET			LA	DIESEL FUEL	45	L	UNITED VAN LINES TRUCK- 45 LITRES OF DIESEL FUEL TO GROUND.	P	Human health	100
9006010493	1-Jun-90	THUNDER BAY CITY	JOHN JUMBO REC. CENTRE ON TOIVO ST.	331940	5369290	LW	FUEL OIL	<900	L.	BACKENTRY - CITY PARKS & REC. DEPT. < 900 LITRES FUEL OIL TO GROUND.	P	Soil contamination	100
9006010533	15-Jun-90	THUNDER BAY CITY	1120 ALLOY DRIVE			L	DIESEL FUEL	20	L	HUSKY (SERVICE STATION): 20L DIESEL FUEL TO GROUND	N		
9006010766	2-Jul-90	THUNDER BAY CITY	LAKE SUPERIOR			W	PETROLEUM OIL (N.O.S.)		UKN	BACK ENTRY: LARGE OIL SLICK ON LAKE SUPERIOR TRAILING TANKER.	P	Water course or lake	0
9006010603	3-Jul-90	THUNDER BAY CITY	B & B STONE			L	DIESEL FUEL		UKN	BACKENTRY - SOIL CONTAM- INATED AROUND OLD DIESEL FUEL TANK.	P	Groundwater pollution	100
@	4-Jul-90	THUNDER BAY DISTRICT				L	FUEL OIL		UKN	BACKENTRY-THUNDER BAY GENSTN. -FUEL OIL ON SURFACEOF GROUND, NO LEAKS FOUND	N		0
@	4-Jul-90	THUNDER BAY CITY	1020 PACIFIC AVENUE	335670	5362706	L	GASOLINE	50	L	HUSKY: 50L GASOLINE TO GROUND AFTER DRIVER OVERFILLED TANK	N		100
9006010598	4-Jul-90	THUNDER BAY CITY	LAKE SUPERIOR / HARBOUR.			W	DIESEL FUEL	80	L	THUNDER BAY TERMINALS: 20L DIESEL OIL TO LAKE AFTER NOZZLE BROKE	N	Water course or lake	0
9006010672	18-Jul-90	THUNDER BAY CITY				A	CHLORINE (COMPRESSED GAS)		UKN	GREAT LAKE FOREST PROD. UNKNOWN AMOUNT, CHLORINE TO ATM/ GASKET BLEW	N		
9006010693	24-Jul-90	THUNDER BAY CITY	269 ELRON CRES.	331435	5363472	L	TRANSFORMER OIL (GT 50 PPM PCB)	0.5	L	PUC - UNKNOWN QTY OIL (120 PPM PCBS) TO GROUND FROM LEAKY TRANSFORMER.	N	Soil contamination	95
9006010695	26-Jul-90	THUNDER BAY CITY	596 10TH AVE.			L	DIESEL FUEL	200	L	G.C.RENTALS - 200 LTR DIESEL TO DITCH WHEN CRANE OVERTURNED.	P	Soil contamination	99
9006010730	2-Aug-90	THUNDER BAY CITY	LAKEHEAD UNIVERSITY ADJACENT TO CENTENNIAL BLDG., NEW SUDENT UNION BLDG.	332752	5365628	L	SEWAGE (UNTREATED/RAW)	90	L	LAKEHEAD UNIVERSITY - SEWAGE TO EXCAVATION DUE TO BROKEN SEWER LINE.	N		0
9006010560	7-Aug-90	THUNDER BAY CITY	CARAMAT			W	SEWAGE (UNTREATED/RAW)			BACK ENTRY-PUC: RAW SEW- AGE UPWELLING FROM CREEK.PUMPS HAD FAILED.	P	Human health	100
9006010785	8-Aug-90	THUNDER BAY CITY	1510 DAWSON RD.	331442	5370374	L	POTASSIUM HYDROXIDE (SOLID/FLAKE)	1	M3	BACKENTRY - POTASSIUM HYDROXIDE TO GROUND FROM PUNCTURED DRUM.	N		99
9006010787	8-Aug-90	THUNDER BAY CITY	POLE TRANSFORMER ON FREDERICA ST. AT EDWARD ST. (BEHIND LIQUOR STORE)	331267	5359344	L	MINERAL OIL (LT 50 PPM PCB)	<5	L	THUNDER BAY HYDRO - <5 L OF MINERAL OIL TO GROUND FROM POLE TRANSFORMER.	N		100
9006010709	11-Aug-90	THUNDER BAY CITY	AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	25	L	MAINTAIR AVIATION -25 L. AVIATION FUEL TO CONCRETE, CLEANED UP.	N		100
9006010742	14-Aug-90	THUNDER BAY CITY				W	FILLER CLAY	15-20	T	BACK ENTRY:15-20 TONNES FILLER CLAY SPILLED FROM RAILCAR INTO LAGOON.	N		0
@	15-Aug-90	THUNDER BAY CITY	IN CP RAIL YARD			L	UNKNOWN	15	L	CP RAIL-LEAK FROM RAILCAR15 L UNREGULATED MATERIAL SPILLED. CLEANED.	P	Soil contamination	90
90601818	17-Aug-90	THUNDER BAY CITY	HARDISTRY AND CAMERON STREET	334230	5361819	L	DIESEL FUEL	9	L	BACKENTRY - 9 LTR DIESEL FUEL TO THE ROAD.	N		100

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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9006010871	28-Aug-90	THUNDER BAY CITY	827 HAROLD CRESCENT			L	WASTE OIL	1000	L	ENGINE REBUILDING-1000 LWASTE OIL TO GROUND.	C	Soil contamination	100
@	31-Aug-90	THUNDER BAY CITY				L	DIESEL FUEL	20	L	ESSO BULK STATION - 20 L OF DIESEL FUEL TO PAVEMENT AT LOADING RACK.	N	Other	100
@	31-Aug-90	THUNDER BAY CITY	508 ARTHUR STREET WEST	330400	5361122	L	GASOLINE	10	L	BULK CARRIER: 10 L GASO- LINE TO GROUND FROM TANK-ER.	N		100
9006010922	7-Sep-90	THUNDER BAY DISTRICT	MAIN SEWER LAGOON, ABITIBI-PRICE FORT WILLIAM DIVISION			W	SLUDGE (N.O.S.)	300	M3	ABITIBI:FORT WLM. 300 M3 DRUDGING TO KAMINISTIGUARIVER(MAIN SEWER LAGOON).	N	Water course or lake	50
@	13-Sep-90	THUNDER BAY CITY	HWY 11/17 AT HWY 527			L	DIESEL FUEL	135	L	BACKENTRY - RKF TRUCK LINES: 135 L DIESEL FUEL TO ROAD/DITCH	C	Soil contamination	100
@	25-Sep-90	THUNDER BAY CITY	LAKE SUPERIOR			W	TALL OIL (TALLOL) (LIQUID ROSIN)	18 000	L	BACKENTRY - CP FOREST PRODUCTS: 18 000 L TALL OIL TO LAKE	P	Water course or lake	0
@	1-Oct-90	THUNDER BAY CITY				W	FILLER CLAY	14.5	T	BACKENTRY-ABITIBI PRICE- 14.5 M/T CLAY TO SEWER, SETTLED OUT IN PONDS	N		50
@	10-Oct-90	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	13	L	BACKENTRY - MAINTAIR: 13 L JET FUEL SPILLED TO GROUND	N		100
9006011076	19-Oct-90	TERRACE BAY TWP.	LAKE SUPERIOR AQUASAKAN GEN.STN. (ONT. HYDRO) 5 MI. EAST OF SCHREIBER,TERRACE			W	LUBRICATING OIL/GREASE	65	L	ONT.HYDRO, AQUASAKAN GENERATING STN. 65 L LUBRICA-TING OIL INTO L.SUPERIOR	P	Water course or lake	60
@	23-Oct-90	THUNDER BAY CITY	ON HWY. 61B AT 3-WAY INTERSECTION NEAR THE KAM RIVER BRIDGE			L	SODIUM CHLORATE (SOLUTION)	20	L	TRIMAC - 20 L OF SODIUM CHLORATE LIQUOR TO GROUNDFROM DOME ON TANK TRUCK.	N		100
@	24-Oct-90	THUNDER BAY CITY	LAKE SUPERIOR			W	COOKING LIQUOR (MGSO4)	175	L	BACKENTRY: ABITIBI-PRICE-175 L ACID COOKING LIQUORTO LAKE SUPERIOR.	P	Water course or lake	0
9006011090	26-Oct-90	THUNDER BAY CITY	ONT.HYDRO POLE TRANSFORMER (3RD SIDE RD OFF JOHN STREET RD.)THUNDER BAY			L	MINERAL OIL (LT 50 PPM PCB)	113	L	ONT.HYDRO TRANSFORMER: 113 L TRANSFORMER OIL TO GRND. NO PCB'S.	P	Soil contamination	90
9006011215	5-Nov-90	THUNDER BAY CITY	ABITIBI- PAPER MACHINE AREA & STORAGE CONTAINER, THUNDER BAY CITY			W	SURFACTANT (N.O.S.)	675	L	ABITIBI- 150 GALLONS OF DIACHEM 123 LOST TO LAKE SUPERIOR	N		0
@	8-Nov-90	THUNDER BAY CITY	AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	3	L	MAINTAIR AVIATION - 3 L. AVIATION FUEL TO TARMAC, CLEANED UP.	N		100
@	16-Nov-90	THUNDER BAY CITY	MNR FIRE CENTRE			L	GASOLINE	40	L	MNR:40L GASOLINE TO GROUND FROM TANK OVERFILL.	P	Soil contamination	80
@	21-Nov-90	THUNDER BAY CITY	LINKO TOWER, HWY 17, DOG RIVER RD			L	TRANSFORMER OIL	36	L	ONTARIO HYDRO:36L TRANS- FORMER OIL LEAKED TO GROUND.	P	Soil contamination	100
@	28-Nov-90	THUNDER BAY CITY	KAMINISTIKWIA RIVER			W	PULP LIQUOR	300000	L	CP FOREST PRODUCTS: 300,000 L SPENT LIQUOR TO RIVER.	P	Water course or lake	0
@	6-Dec-90	THUNDER BAY CITY	KAMINISTIKWIA RIVER			W	SULPHURIC ACID	3000	L	BACKENTRY-C.P.F.P.-3.0 M3SULFURIC ACID TO OUTFALL NEUTRALIZED WITH CAUSTIC	N		50
@	10-Dec-90	THUNDER BAY CITY	ARTHER ST.NEAR THUNDER BAY MALL			L	HYDRAULIC OIL	25	L	BACKENTRY-ONT HYDRO-25 L.HYDRAULIC OIL TO GROUND CONTAINED & CLEANED-UP	N		98
@	10-Dec-90	THUNDER BAY CITY	HWY 17 EAST OF THE ENGLISH RIVER			L	DIESEL FUEL	200	L	TRANSPORT TRUCK: 230L DIESEL SPILLED TO ROAD.	P	Soil contamination	0
@	13-Dec-90	THUNDER BAY CITY	KIMBERLY-CLARK			L	SULPHURIC ACID	900	L	BULK TRANSPORT: 900L SULFURIC ACID TO GROUND.	P	Soil contamination	100
@	16-Dec-90	THUNDER BAY CITY	KAMINISTIKWIA RIVER			W	SODIUM HYPOCHLORITE	900	L	BACKENTRY - OGILVIE MILLS900 L SODIUM HYPOCHLORITESOLUTION TO RIVER	P	Water course or lake	0
@	17-Dec-90	THUNDER BAY CITY	WARDROPE AVE AND ONION LAKE RD	334327	5370277	L	GASOLINE		UKN	VILLAGE MARKET: GASOLINE TO GROUND FROM UST.	P	Soil contamination	0
@	21-Dec-90	THUNDER BAY CITY	96 NORTH HIGH ST.	334915	5367753	A	SODIUM HYDROXIDE FUMES		UKN	HILLCREST SCHOOL: SODIUM HYDROXIDE VENTED INTO SCHOOL	P	Air Pollution	0
@	28-Dec-90	THUNDER BAY CITY	HUSKY STN ON ARTHUR ST			L	GASOLINE	15	L	HUSKY: 15L GASOLINE SPILLED TO CONCRETE.	N		98
@	7-Jan-91	THUNDER BAY CITY	18 NORTH ROCKWOOD STREET	334095	5367799	L	DIESEL FUEL	60	L	THUNDER BAY HYDRO: 60 L DIESEL FUEL TO ROAD WHEN FUEL LINE RUPTURED	N		100
@	8-Jan-91	THUNDER BAY CITY	1055 COMMERCE STREET	329899	5360302	L	HYDRAULIC OIL	900	L	BACKENTRY-900 LITERS HYDRAULIC OIL SPILLED TO GRND BY BULK OIL CARRIER.	N		99
@	21-Jan-91	THUNDER BAY CITY	LAKE SUPERIOR			W	ETHYLENE GLYCOL (ANTIFREEZE)		UKN	BACKENTRY: ABITIBI-PRICE UNKNOWN AMT GLYCOL LEAKEDTO LAKE VIA FLOOR DRAIN.	N		90
@	30-Jan-91	THUNDER BAY CITY	2829 VICTORIA AVE.	331322	5361534	L	MERCURY	3	OZ	BACKENTRY: MEDICAL OFFICE-3 OZ MERCURY TO PAVEMENTDUE TO VANDELS.	N		100
@	30-Jan-91	THUNDER BAY CITY				L	PA-7M (SULPHITE PULPING AID)		UKN	BACKENTRY: ABITIBI-PRICE UNK QTY COOLING AGENT TO GROUND FROM CONTAINER.	N		100
@	4-Feb-91	THUNDER BAY CITY	LAKE SUPERIOR TRANSPORT TRUCK			LW	DIESEL FUEL	30	L	TRANSPORT TRUCK-30 LITRESDIESEL FUEL TO GROUND ANDSEWER OVER 1.5 HOURS.	P	Water course or lake	0
@	7-Feb-91	THUNDER BAY CITY	MISSION ISLAND			W	HYDRAULIC OIL		UKN	BACKENTRY: ABITIBI-MINOR QUANTITY HYDRAULIC OIL TOLAGOON VIA DRAIN.	N		75
@	10-Feb-91	THUNDER BAY CITY	IMPERIAL TRAILER PARK			L	FURNACE OIL	450	L	450 LTR FURNACE OIL TO LAND AT TRAILER PARK WHENTANK RUPTURED.	P	Soil contamination	75
@	11-Feb-91	THUNDER BAY CITY	149 PROSPECT AVE.	335289	5367866	L	HYDRAULIC OIL	4	L	PUC -4 L. HYDRAULIC OIL TO GROUND FROM HYDRAULIC SAW.	N		100

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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
@	18-Feb-91	THUNDER BAY CITY	VILLAGE MARKET, CORNER OF WARDROBE & ONION LAKE RD.	334327	5370277	L	GASOLINE	20000	L	BACKENTRY - 20,000 L GASOLINE LEAKED FROM TANKNO ENVIRONMENTAL IMPACT.	N		60
@	25-Feb-91	THUNDER BAY CITY				LW	FURNACE OIL	45	L	HOME HEATING OIL TANK-45 L.FURNACE OIL TO FLOOR DRAIN & SANITARY SEWER	P	Water course or lake	
@	27-Feb-91	THUNDER BAY CITY	OLIVER ROAD			L	LIME SLURRY/SLUDGE		UKN	BRUNO'S CONTRACTING-8 K/MOF HWY(OLIVERS RD)COVEREDWITH LIME MUD,CLEANED-UP	N		100
@	1-Mar-91	THUNDER BAY CITY				WA	GASOLINE		L	PETRO CANADA - UNKNOWN AMOUNT OF GASOLINE TO SEWER SYSTEM.	P	Water course or lake	0
@	1-Mar-91	THUNDER BAY CITY				L	DIESEL FUEL	200	L	BACKENTRY: THUNDER BAY TERMINALS - APPROX 200 L DIESEL FUEL TO GROUND.	N		99
@	6-Mar-91	THUNDER BAY CITY	LAKE SUPERIOR, THUNDER BAY HARBOUR			LW	PULP FIBRE	58140	M3	ABITIBI-PRICE -LAGOON DREDGINGS AND ASH TO HARBOUR.	P	Water course or lake	90
@	12-Mar-91	THUNDER BAY CITY	CP-RAIL YARD ON HARDESTY RD. (OLD DIESEL SHOP)			L	DIESEL FUEL	100	L	CP RAIL- 100L DIESEL FROMYARD ENGINE ONTO ICE DUE TO BUSTED LINE.CONTAINED.	N	Soil contamination	75
@	16-Mar-91	THUNDER BAY CITY	RED RIVER RD & THE EXPRESSWAY	333560	5368721	L	NICKEL COPPER CONCENTRATE (SLURRY)	29250	L	TRUCK HAULING FOR INCO OVERTURNED, NICKEL COPPERCONCENTRATE TO DITCH.	N		99
@	17-Mar-91	THUNDER BAY CITY	465 NORTH VICKER ST. NEEBING RIVER	333295	5362276	LW	GASOLINE	15	L	GASOLINE TO ROAD & SEWER FROM CAR WITH SLOW LEAK.	N	Water course or lake	99
@	17-Mar-91	THUNDER BAY CITY	214 BRENT ST. MCVICKERS CREEK	335162	5369296	LW	DIESEL FUEL	25	L	DIESEL TO ROAD & SEWER FROM TRUCK THAT LEAKED TONOW MELTED SNOW.	P	Water course or lake	75
@	21-Mar-91	DRYDEN TOWN				L	LUBRICATING OIL/GREASE	1100	L	BACKENTRY: C.P.F.P.- 1100L OF LUBE OIL TO GROUND.	N		85
@	27-Mar-91	THUNDER BAY CITY	KAMINISTIKWIA RIVER			W	GLUTEN	200	LBS	BACKENTRY-OGILVIE MILLS. 90 KG (3 LUMPS) OF GLUTENSPILLED INTO KAM RIVER	N		99
@	28-Mar-91	THUNDER BAY CITY				L	GASOLINE	15	L	PETRO CANADA - 15 L. GAS TO GROUND WHILE REFILLINGTANKS	N		99
@	29-Mar-91	THUNDER BAY CITY	HWY 102 BYPASS, DAWSON TRUCK STOP			L	DIESEL FUEL	110	L	TRANSPORT TRUCK-110 L. DIESEL FUEL TO PAVED AREACONTAINED AND CLEANED	N		98
@	2-Apr-91	THUNDER BAY CITY	PELLETIER'S BODY SHOP, RR #4 219 HWY 16B,			L	GASOLINE	2250	L	PELLETIER'S BODY SHOP - 2250 L GASOLINE SPILL TO GRND DUE TO VANDALISM.	N	Soil contamination	60
@	12-Apr-91	THUNDER BAY CITY	LAKE SUPERIOR, POOL # 7			W	PETROLEUM OIL (N.O.S.)		UKN	MARINE VESSEL-UNKNOWN QTYOIL SPILLED TO HARBOUR COVERING APPROX 44 SQ/M.	P	Water course or lake	99
@	13-Apr-91	THUNDER BAY CITY	CASCADE RD. & JUNOT AVE.	332266	5367376	L	GASOLINE	22	L	22L GASOLINE SPILL FROM CAR	P	Soil contamination	99
@	16-Apr-91	THUNDER BAY CITY	346 NORTH MAY ST.			L	GASOLINE	8	L	FIRE DEPT. -8 L. GASOLINETO GROUND AT SEVEN-ELVEN GAS BAR, CLEANED UP.	N		100
@	22-Apr-91	THUNDER BAY CITY	LAKESHORE DRIVE (0.6KM WEST,HAUGER RD.) 7-8 MILES EAST OF THUNDER BAY			W	GASOLINE	45	L	45L GASOLINE SPILLED INTODITCH FROM FUEL TANK WHENVEHICLE ROLLED OVER	N	Water course or lake	0
@	24-Apr-91	THUNDER BAY CITY	LAKE SUPERIOR			W	SODIUM HYDROXIDE (SOL'N) (CAUSTIC SODA)	18000	KG	BACKENTRY: ABITIBI-PRICE -18000 KG SODIUM HYROXIDETO LAKE VIA SEWER LAGOON.	P	Water course or lake	0
@	26-Apr-91	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	GASOLINE		UKN	BACKENTRY: GASOLINE LEAK-ING FROM FUEL TANK USED FOR AIRPORT VEHICLES.	N		0
@	26-Apr-91	THUNDER BAY CITY	VICKERS STREET			L	ALUMINUM SULFATE, SOLUTION (ALUM)	50	L	BACKENTRY: EAGLEBROOK - 50 L ALUMINUM SULPHATE TOGRND FROM TANK CAR.	N		99
@	30-Apr-91	THUNDER BAY CITY	580 NEW VICKERS	333283	5360220	L	WASTE OIL	500	L	BACKENTRY: WELDING SHOP -APPROX. 500 L USED OIL TOGROUND FROM OPEN BARRELS.	C	Soil Contamination	50
@	16-May-91	THUNDER BAY CITY				L	EFFLUENT (NOT OTHERWISE SPECIFIED)		UKN	BACKENTRY: C.P.F.P.- FOAMON RIVER DUE TO QUALITY OF EFFLUENT BEING POOR.	C	Other	0
@	23-May-91	THUNDER BAY CITY				L	SLUDGE (N.O.S.)	100	L	RON ENGINEERING-100 L. DIGESTER WASTE TO GRND CLEANED-UP	N		100
@	27-May-91	THUNDER BAY CITY	HIGHWAY 11-17, HODDER AVE. (EAST OF)			L	DIESEL FUEL	10	L	BACKENTRY: NOR-SHORE -10LDIESEL FUEL TO HWY FROM LEAKING FUEL TANK.	N		99
@	8-Jun-91	THUNDER BAY CITY	1344 NIPIGON AVE.	329750	5359495	L	HYDRAULIC OIL	6	L	POOLS OF HYDRAULIC OR MOTOR OIL ON ROAD.	N		99
@	11-Jun-91	THUNDER BAY CITY	GOODS RD OF BELROSE RD.	330230	5367850	L	HYDRAULIC OIL	2.5	L	BACKENTRY:NOR-SHORE READYMIX-2.5 L.HYDRAULIC OIL &1 M3 CEMENT TO DITCH	N		95
@	11-Jun-91	THUNDER BAY CITY	GOODS ROAD (OFF BELROSE RD.)	330230	5367850	L	CEMENT	765	L	BACKENTRY: NOR-SHORE - 765 L CEMENT TO GRND FROMOVERTURNED CEMENT TRUCK.	N		90
@	12-Jun-91	THUNDER BAY CITY	LAKE SUPERIOR			W	DYE (N.O.S., POISONOUS LIQUID)		UKN	BACKENTRY: ABITIBI-PRICE-DYE OVERFLOWED RESULTING IN BLUE FOAM IN RIVER.	P	Water course or lake	0
@	20-Jun-91	THUNDER BAY CITY	KAMINISTIKWIA RIVER KAN RIVER			W	STARCH	225	L	BACKENTRY: OGILVIE MILLS - 225 L STARCH AND FOAM TO KAN RIVER FROM OV/FLOW	N		0

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@	25-Jun-91	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	10	L	MAINTAIR: 10 L JET FUEL TO GROUND FROM VENT ON TANK TRUCK	N		100
@	25-Jun-91	THUNDER BAY CITY	TANK TRUCK			L	AVIATION FUEL (JET A OR B, TURBO)	10	L	MAINTAIR AVIATION - 10L SPILL OF JET A FUEL FROM TANK TRUCK ONTO GROUND.	N		99
@	26-Jun-91	THUNDER BAY CITY	STRATHCONA AVE.			L	DIESEL FUEL	3	L	CITY GARBAGE TRUCK- 2-3 L DIESEL FUEL TO GROUND WHEN CAP LEFT OFF.	N		100
@	26-Jun-91	THUNDER BAY CITY	STRATHCONA AVE.			L	GASOLINE	3	L	BACKENTRY-CITY GARBAGE TRUCK -3 LTR. GASOLINE TOSTREET.	N		0
@	27-Jun-91	THUNDER BAY CITY	GOODS RD., 1,000 FT. FROM BELROSE ROAD.			L	MOTOR OIL	6	L	IRWIN READY MIX -6 L. MOTOR OIL TO DITCH.	N		99
@	27-Jun-91	THUNDER BAY CITY	LAKE SUPERIOR			W	PULP MILL EFFLUENT		UKN	ABITIBI-PRICE: EFFLUENT DISCHARGED TO RIVER VIA UNDERGROUND LEAK	P	Water course or lake	0
@	29-Jun-91	THUNDER BAY CITY	NEEBING AVE. AT WALSH ST.	329227	5360217	L	MOTOR OIL	22	L	CANADIAN PACIFIC FOREST..-MOTOR OIL TO ROADWAY.	N		99
@	1-Jul-91	THUNDER BAY CITY	163 PINE ST. (PORT ARTHUR)	334772	5368181	L	LIGHT OIL	20	L	CAN-PACIFIC FOREST PROD. -90 L. FUEL OIL TO GROUNDFROM TANK ON TRUCK.	N	Water course or lake	0
@	3-Jul-91	THUNDER BAY CITY	ESSO SERVICE ST., DAWSON RD. TRUCK STOP.			L	DIESEL FUEL	30	L	KLEASON TRANSPORT TRUCK- 30 L. DIESEL FUEL SPILL ON GROUND FROM SADDLE TK.	N		90
@	4-Jul-91	THUNDER BAY CITY	ON CONCRETE PAD AT AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	12	L	MAINTAIR AVIATION - 12 L OF AVIATION FUEL TO CONCRETE PAD.	N		99
@	14-Jul-91	THUNDER BAY CITY	EXPRESSWAY AND HODDER AVE.	338767	5372333	L	DIESEL FUEL	600	L	TRANSPORT TRUCK-600 L. OFDIESEL FUEL TO DITCH FROMSADDLE TANKS,FD,MOT,OPP.	P	Soil contamination	
@	18-Jul-91	THUNDER BAY CITY	LAKE SUPERIOR			W	SODIUM HYDROXIDE (SOL'N) (CAUSTIC SODA)	500	L	ABITIBI-PRICE: 500L SODIUM HYDROXIDE TO SEWERDUE TO BROKEN VALVE	N	Surface Water Pollution	0
@	22-Jul-91	THUNDER BAY CITY	ARTHUR AND THE TRANSCANADA HIGHWAY			L	DIESEL FUEL	125	L	MOTOR VEHICLE-125 L DIESEL FUEL TO ROAD.	N		95
@	29-Jul-91	THUNDER BAY CITY	C.P.F.P YARD			L	DIESEL FUEL	5	L	BACKENTRY: YANK TRANSPORT-MINOR AMT DIESEL FUEL TOGRND DUE TO PIPE LEAK.	N		0
@	19-Aug-91	THUNDER BAY CITY	760 WEST ARTHUR ST.	329437	5361141	L	GASOLINE		UK	SHELL CANADA -UNDERGROUNDLEAK AT SERVICE STATION.	P	Groundwater pollution	0
@	23-Aug-91	THUNDER BAY CITY	THUNDER BAY AIRPORT, MAIN APRON	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	15	L	MAINTAIR - 15 LTR JET FUEL SLOPPED TO APRON FROM TRUCK WITH OPEN VENT	N		100
@	26-Aug-91	THUNDER BAY CITY	623 MONTGOMERY	333438	5366760	L	TRANSFORMER OIL (N.O.S.)	50	L	PUC TRANSFORMER-UNKNOWN QUANTITY OIL TO GROUND- CREW TO TEST FOR P.C.B.	P	Soil contamination	99
@	27-Aug-91	THUNDER BAY CITY	MARLBORO ST			L	DIESEL FUEL	130	L	MOTOR VEHICLE: 130L DIESEL FUEL LEAK FROM AUXILLIARY FUEL TANK	P	Soil contamination	80
@	28-Aug-91	THUNDER BAY CITY	HWY 61B AT MOSQUITO RD. BRIDGE			L	SEWAGE SLUDGE	800	L	C.P. FOREST PRODUCTS:800LSLUDGE/BLACK LIQUOR/SALT FROM BACK OF TRUCK TO GND	P	Soil contamination	95
@	29-Aug-91	THUNDER BAY CITY	1410 WEST FRANCES	329471	5359649	L	PAINT OR PAINT RELATED	2.25	L	2.25 L PAINT DUMPED IN BACK LANE.	N		75
@	21-Sep-91	THUNDER BAY CITY	KAM RIVER			W	TALL OIL (TALLOL) (LIQUID ROSIN)	60	M3	C.P.F.P. - 60 M3 TALL-OILTO MILL CLARIFIER,UNKNOWNAMOUNT TO KAM RIVER.	C	Water course or lake	90
@	25-Sep-91	THUNDER BAY CITY	BIRCH ST. SUB-STATION			L	TRANSFORMER OIL (N.O.S.)	100	L	ONT.HYDRO - 100 LTR OIL TO GROUND AT SUB-STN. WHEN TRANSFORMER EXPLODED	N		90
@	25-Sep-91	THUNDER BAY CITY	RED RIVER ROAD AT JUNOT AVE	333664	5368501	L	HYDRAULIC OIL	4	L	HYDRO: 4 L HYDRAULIC OIL TO GROUND IN VEHICLE ACCIDENT	C	Other	100
@	30-Sep-91	THUNDER BAY CITY	5 KM EAST OF CRYSTAL BEACH ROAD			L	GASOLINE	5	L	SINGLE VEHICLE ACCIDENT- 5 L GASOLINE TO DITCH FROM FUEL TANK.	N	Soil contamination	50
@	8-Oct-91	THUNDER BAY CITY	BELLROSE RD., BETWEEN JOHN ST. RD. & OLIVER RD.			L	OILY MATERIAL N.O.S.		UKN	BACKENTRY - BELLROSE RD: GREASE FROM 2 CANISTERS TO GROUND.	N	Soil contamination	100
@	9-Oct-91	THUNDER BAY CITY	269 RED RIVER ROAD	335566	5367128	L	DIESEL FUEL	12	L	TRANSPORT TRUCK-8 LITRES DIESEL FUEL TO GRND FROM OVERFILLED FUEL TANK.	N		100
@	13-Oct-91	THUNDER BAY CITY	CP RAIL PROPERTY NORTH WATER STREET			L	WASTE OIL	90	L	CP RAILWAYS: 90 L DRUM FILLED WITH WASTE LIQUID TIPPED BY VANDALS	C	Soil contamination	100
@	17-Oct-91	THUNDER BAY CITY	UTDC CANCAR COMPUTER ROOM			A	HALON (CFC)			UTDC - HALON GAS VENTED TO ATM FROM FIRE EXTING. SYSTEM IN COMPUTER ROOM.	P	Other	0
@	17-Oct-91	THUNDER BAY CITY		332578	5365488	L	DIESEL FUEL	140	L	LAKEHEAD UNIVERSITY - 140 L. OF SIESEL TO GROUND. SET ON FIRE	C	Soil Contamination	99
@	17-Oct-91	THUNDER BAY CITY	GULF LINKS RD.			L	MINERAL OIL (N.O.S.)	18,160	L	ONTARIO HYDRO -1,8160 L. TRANSFORMER OIL TO GROUNDFROM 2-UNITS, VANDALISM.	P	Surface Water Pollution	0
@	18-Oct-91	THUNDER BAY CITY	NORTH ALGOMA & CLARK STREET			L	TRANSFORMER OIL (N.O.S.)	5400	L	THUNDER BAY HYDRO- 5400L TRANSFORMER OIL SPILLING DUE TO VANDALISM.	P	Soil contamination	80
@	22-Oct-91	THUNDER BAY CITY	CAMPSITE, CORNER OF HERMES LAKE & MOOSE HORN LAKE RDS.			L	HYDRAULIC OIL	900	L	CANADIAN PACIFIC FOREST -900 L. HYDRAULIC OIL TO GROUND, CLEANED UP.	C	Soil contamination	99

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@	22-Oct-91	THUNDER BAY CITY	1756 STANLEY AVE.	329634	5359007	L	HYDRAULIC OIL	10	L	BACKENTRY: CONTRACTOR- 10 L HYDRAULIC OIL TO GRND FROM BROKEN LINE.	N		99
@	26-Oct-91	THUNDER BAY CITY	KAMINISTIKWIA RIVER			W	FLOUR	450	L	OGILVIE FLOUR MILLS-450 LITRES "B"FLOUR TO KAM RIVER,HOSE FAILURE.	N		
@	8-Nov-91	THUNDER BAY CITY	KAM RIVER			L	DIESEL FUEL	500	L	BACKENTRY: GREAT LAKES FOREST PRODUCTS: 250-500LDIESEL FUEL TO GROUND.	P	Water course or lake	0
@	13-Nov-91	THUNDER BAY CITY	OLIVER ROAD			LW	DIESEL FUEL	100	L	ACZ CONSTRUCTION: 100 L DIESEL FUEL TO ROAD AND DITCH FROM VEHICLE	C	Surface Water Pollution	100
@	15-Nov-91	THUNDER BAY CITY	LAKE SUPERIOR			W	CYMENE		UKN	ABITIBI-PRICE: UNK QTY CYMENE TO STORM SEWER DUETO OVERFLOW.	P	Water course or lake	50
@	20-Nov-91	THUNDER BAY CITY				L	BLACK LIQUOR		UKN	BACKENTRY: CPFP - UNK QTYBLACK LIQUOR SPRAYED FROMBROKEN LINE TO GROUND.	N		90
@	28-Nov-91	THUNDER BAY DISTRICT	IN ISOLATED BUSH AREA NORTH OF HWY. 11 &HWY. 527 10 MILES WEST OF BUSH RD.			L	DIESEL FUEL	1500	L	ABITIBI-PRICE - 1500 L OFDIESEL FUEL TO GROUND, CONTAINED, WOODLANDS DIV.	P	Soil contamination	99
@	23-Dec-91	THUNDER BAY CITY	RR #5 ARTHUR STREET			L	WASTE OIL	900	L	A-1 SEWAGE SERVICES: 900 L WASTE OIL TO GROUNDWHILE LOADING TRUCK	C	Surface Water Pollution	95
@	24-Dec-91	THUNDER BAY CITY	548 ARTHUR STREET, (CANADIAN TIRE)			L	GASOLINE	20	L	IMPERIAL OIL: 20 L GASOLINE TO PAVEMENT DUE TO OVERFILL.	N		100
@	16-Jan-92	THUNDER BAY CITY	645 ARTHUR ST. WEST	329931	5361221	L	MINERAL OIL (LT 50 PPM PCB)	20	L	THUNDER BAY HYDRO: 20 L NON-PCB OIL FROM INGROUNDTRANSFORMER TO GROUND.	C	Soil Contamination	90
@	2-Feb-92	THUNDER BAY CITY	HWY 102 NEAR 3010 DAWSON RD.	325322	5373443	L	WASTE SLURRY		UKN	INCO: TANK TRUCK OVERTURNNON-TOXIC MINE SLURRY TO DITCH	C	Soil Contamination	90
@	2-Feb-92	THUNDER BAY CITY	NICKLE STREET			L	DIESEL FUEL	30	L	DAWSON RD. TRUCK STOP: 30 L DIESEL FUEL TO GROUND	N		90
@	10-Feb-92	THUNDER BAY CITY	GORE & JAMES STREET	330426	5359292	L	HYDRAULIC OIL	1000	L	CAMBELL CARTAGE: 1000 L HYDRAULIC OIL TO GRND FROM OVERTURNED TRUCK.	P	Soil Contamination	99
@	10-Feb-92	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	18	L	MAINTAIR AVIATION: 18 L JET A-1 FUEL TO GRND DUE TO MECHANICAL FAILURE.	N		100
@	17-Feb-92	THUNDER BAY CITY	ESSO STATION 740 MEMORIAL AVE	333918	5364715	L	GASOLINE	45	L.	PRIVATE OWNER-45 LITRES GASOLINE TO ESSO STN LOT CONTAINED,CLEANUP ONGOING	N		90
@	18-Feb-92	THUNDER BAY CITY	HWY 11-17			W	DIESEL FUEL		UKN	BACKENTRY: SHELL GAS STN-UNKNOWN QUANTITY DIESEL FUEL FOUND IN DITCH.	N		50
@	21-Feb-92	THUNDER BAY CITY				L	FUEL OIL	200	L	THUNDER BAY TERMINALS: 200 L FUEL OIL TO GRND FROM PARTIALLY OPEN HOSE.	C	Soil Contamination	99
@	27-Feb-92	THUNDER BAY CITY	17 MILES WEST OF UPSALA ON HWY 17			LW	DIESEL FUEL	700	L	INTERCITY TRUCKING - 700LDIESEL TO DITCH WHEN TRACTOR-TRAILER JACK-KNIFED.	N	Soil Contamination	0
@	27-Feb-92	THUNDER BAY CITY	WAYLAND PARK ICE RINK			L	DIESEL FUEL	10	L	BACKENTRY-PUC -10 L. DIESEL FUEL TO ICE RINK, CLEANED UP.	N		99
@	28-Feb-92	THUNDER BAY CITY	COOPER RD., OFF OF ARTHUR ST.			L	DIESEL FUEL			BACKENTRY-ATTWAY TRANSP'T -DIESEL TO GROUND AT FILLING DEPOT, REMOVED.	C	Soil Contamination	99
@	3-Mar-92	THUNDER BAY CITY	HWY 608 NORTH OF HWY 61			L	DIESEL FUEL	200	L.	TRANSPORT TRUCK - 200 L. OF DIESEL FUEL TO GROUND FROM SADDLE TANKS	P	Soil Contamination	75
@	3-Mar-92	THUNDER BAY CITY	COUNTRY VIEW TRAILER PARK			L	GASOLINE	13	L	BACKENTRY-PRIVATE VEHICLE -13 L. GASOLINE TO GRD FROM FUEL TANK, REMOVED.	N		99
@	5-Mar-92	THUNDER BAY CITY				L	TRANSFORMER OIL (N.O.S.)	300	L	THUNDER BAY HYDRO: 300L TRANSFORMER OIL LEAK (<50 PPM PCB'S)	C	Soil Contamination	50
@	11-Mar-92	THUNDER BAY CITY	IMPERIAL OIL TERMINAL AT 1020 PACIFIC AVE.			L	DIESEL FUEL	200	L	ESSO BULK TERMINAL - 200 L OF DIESEL FUEL TO CEMENT AT LOADING RACK.	N	Other	99
@	19-Mar-92	THUNDER BAY CITY	I.O.L.TERMINAL PACIFIC AVE.			L	DIESEL FUEL	155	L.	ESSO-155 LITERS DIESEL FUEL TO GRND,CLEANED-UP ,OVERFLOWED TRUCK.	N		99
@	23-Mar-92	THUNDER BAY CITY	EGAN PLACE			L	CRANKCASE OIL	20	L	WORKS DEPT.GARBAGE TRUCK-20L CRANKCASE OIL/H2O TO ROAD AT EGAN PLACE.	N	Soil Contamination	50
@	25-Mar-92	THUNDER BAY CITY	FRANK'S LOCKER SERVICE 142 HARDISTY ST. SOUTH			A	AMMONIA GAS (ANHYDROUS)		UKN	FRANK'S LOCKER SERVICE - AMMONIA GAS TO ATM FROM REFRIGERATION UNIT.	P	Air Pollution	0
@	27-Mar-92	THUNDER BAY CITY	219 PEARL ST.	335601	5366803	L	MINERAL OIL (LT 50 PPM PCB)	500	L	THUNDER BAY HYDRO - 500L MINERAL/TRANSFORMER OIL NON-PCB SPILL TO GROUND.	C	Soil Contamination	75
@	30-Mar-92	THUNDER BAY CITY	CIRCLE INN MEMORIAL AVE.			L	MINERAL OIL (LT 50 PPM PCB)	100	L	THUNDER BAY HYDRO - 100 L OF MINERAL OIL TO GROUND FROM TRANSFORMER	N		95
@	7-Apr-92	THUNDER BAY CITY	HWY 17, 1 KM EAST OF HWY 527			L	SALT	180	KG	MTO: 180 KG SALT TO ROAD & SHOULDER FROM TRUCK.	N		90
@	10-Apr-92	THUNDER BAY CITY	HARBOUR EXPRESSWAY/MEMORIAL			L	TRANSFORMER OIL (N.O.S.)	20	L	THUNDER BAY HYDRO: 20 L TRANSFORMER OIL TO GROUND	C	Soil Contamination	100

Table H-4
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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
@	16-Apr-92	THUNDER BAY CITY	BAY ST/ALGOMA ST			L	TRANSFORMER OIL (N.O.S.)	10	L	THUNDER BAY HYDRO - 10L TRANSFORMER OIL TO GROUND, WELD FAILURE.	C	Soil Contamination	50
@	26-Apr-92	THUNDER BAY CITY	LAKE SUPERIOR TB LOADING DOCK			W	CANOLA OIL	450	L	A.D.M. AGRI-INDUSTRIES - 200-450L CANOLA OIL TO LAKE SUPERIOR.	P	Surface Water Pollution	50
@	30-Apr-92	THUNDER BAY CITY				A	GASOLINE			CENTRAL MOTORS ESSO: POSSIBLE GASOLINE LOSS TOSANITARY SEWERS	P	Human Health or Safety	0
@	1-May-92	THUNDER BAY CITY	LAKE SUPERIOR			W	SULPHURIC ACID	24000	L	ABITIBI-PRICE INC: 24000LSULPHURIC ACID TO LAKE VIA STORM DRAIN.	P	Surface Water Pollution	0
@	6-May-92	THUNDER BAY CITY	NORTH ROAD SERVICE CENTRE			L	TRANSFORMER OIL (N.O.S.)	0.5	L.	ONTARIO HYDRO-0.5 LITRE TRANSFORMER OIL(NON PCB'S)TO GRND & TRUCK HOOD.	N		99
@	8-May-92	THUNDER BAY CITY	MAPLE WARD AND JOHN ST, NEAR JOHN STREET LANDFILL	324167	5368225	L	SEWAGE SLUDGE	450	L	TERRATER TRANSPORT - 450 L OF DIGESTER SLUDGE TO ROADWAY	N		90
@	12-May-92	THUNDER BAY CITY				L	SULPHURIC ACID	4360	L	PROVINCIAL PAPERS -4360 L SULPHURIC ACID TO GRD., CONTAINED AND NEUTRALIZED	C	Soil Contamination	90
@	13-May-92	THUNDER BAY CITY	DAWSON ROAD/HILLDALE	333052	5369365	L	DIESEL FUEL	100	L	TRANSPORT TRUCK: CONTENTS OF FUEL TANK TO ROAD IN VEHICLE ACCIDENT	N		100
@	15-May-92	THUNDER BAY CITY				L	FERRIC CHLORIDE (SOLUTION)	680	L.	CITY OF THUNDER BAY-680 LITERS FERRIC CHLORIDE TO GRND,RECOVERED,REUSED.	N		99
@	15-May-92	THUNDER BAY CITY	147 ARTHUR STREET, NEAR MCDONALDS	331119	5361183	L	GASOLINE	20	L	PETRO-CANADA TANK TRUCK - 20 L OF GASOLINE SPILLED TO GROUND	N		95
@	15-May-92	THUNDER BAY CITY	GAS STATION, 147 ARTHUR ST, NEXT TO MACDONALDS	331119	5361183	L	GASOLINE	20	L	PETRO-CANADA - 20L GAS TOGROUND. TRUCK DRIVER OPENED WRONG VALVE.	N		75
@	1-Jun-92	THUNDER BAY CITY	LAKE SUPERIOR, THUNDER BAY TERMINAL			W	PAINT OR PAINT RELATED N.O.S.	5	L	CANADA TRANSPORT (VESSEL)- 5 L SILVER PAINT & OIL TO LAKE SUPERIOR.	C	Surface Water Pollution	75
@	6-Jun-92	THUNDER BAY CITY	LAKE SUPERIOR, (THUNDER BAY HARBOUR - POOL 7B)			W	WOOD PRESERVATIVE, N.O.S.		UKN	THUNDER BAY HARBOUR:LIGHTOIL SLICK (PRESERVATIVE);SOURCE UNKNOWN.	P	Surface Water Pollution	0
@	12-Jun-92	THUNDER BAY CITY	KAMINISTIQUIA RIVER, AREA OF VICTOR ST.			W	DIESEL FUEL		UKN	RESIDENT -DIESEL FUEL SHEEN ON KAMINISTIQUIA R., CONFIRMED, SOURCE UNK.	N		0
@	26-Jun-92	THUNDER BAY CITY	1/2 MILE FROM SHABAQUA (WEST OF THUNDER BAY) ON TRANSCANADA HWY			L	DIESEL FUEL	5	L	TRACTOR-TRAILER IN DITCH-UNK. QUAN. DIESEL FUEL TOGRND DUE TO VEHICLE ACC.	N	Soil contamination	100
@	27-Jun-92	THUNDER BAY CITY	DOG RIVER MAINLINE VALVE + 11.55 KM.			W	SAND/GRAVEL	5	M3	TRANSCANADA PIPELINE-5 M3SAND TO DOG RIVER DURING HYDROSTATIC TEST OF LINE.	N		0
@	5-Jul-92	THUNDER BAY CITY	CN THUNDER BAY DIESEL SHOP			L	DIESEL FUEL	60	L	CANADIAN NATIONAL RAILWAY - 60 L OF DIESEL FUEL TO GROUND.	C	Soil Contamination	60
@	16-Jul-92	THUNDER BAY CITY				L	DIESEL FUEL	68	L	MCDONALD FUELS- 68 L DIESEL FUEL TO PVMT WHEN TANK OVERFLOWED.	N		75
@	17-Jul-92	THUNDER BAY CITY	CUMBERLAND STREET BETWEEN PEARL AND PARK	335726	5366847	L	HYDRAULIC OIL	20	L	BROWNING-FERRIS IND.: 20 L HYDRAULIC OIL TO ROAD FROM TRUCK	N		100
@	23-Jul-92	THUNDER BAY CITY	LAKE SUPERIOR			W	METHYL VIOLET	25	L	ABITIBI PRICE -25 L. METHYL VIOLET DYE TO LAKE SUPERIOR VIA LAGOON.	N		0
@	26-Jul-92	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	15	L	SHELL: 15 L JET FUEL TO ASPHALT FROM TANK TRUCK; CLEANED-UP	N	Other	99
@	27-Jul-92	THUNDER BAY CITY	LAKE SUPERIOR			W	AVIATION FUEL (JET A OR B, TURBO)		UKN	AIRCRAFT DOWNED -FUEL SPILLING OUT TO LAKE.	P	Water course or lake	0
@	21-Aug-92	THUNDER BAY CITY	KAMINISTIQUIA RIVER			LW	DETERGENT	1000	L	BACKENTRY- C.P. FOREST PRODUCTS: 1000L DETERGENTLEAK FROM BULK CONTAINER	P	Water course or lake	80
@	28-Aug-92	THUNDER BAY CITY	25 KM EAST OF MARATHON ON HWY 17			LW	MOTOR OIL	40	L	TRANSPORT TRUCK - LIQUID OXYGEN TANKER ROLLED OVERAND GAS RELEASED	C	Soil contamination	0
@	9-Sep-92	THUNDER BAY CITY	RED RIVER ROAD/HWY. 11/17 INTERSECTION	333560	5368721	L	FURNACE OIL	2600	L	EMPTY LOT-2600 LITRES HEATING FUEL & WATER IN SOIL; UNDERGRD TANK LEAK.	C	Soil contamination	90
@	13-Sep-92	THUNDER BAY CITY	TRANSFORMER AT 725 SOUTH JAMES	330372	5360199	L	MINERAL OIL (LT 50 PPM PCB)	25	L	THUNDER BAY HYDRO - 25 L TRANSFORMER OIL TO GROUNDFROM POLE TRANSFORMER.	P	Soil contamination	100
@	15-Sep-92	THUNDER BAY CITY	KAM RIVER			W	BLACK LIQUOR	450	L	CANADIAN PACIFIC FOREST -450L BLACK LIQUOR TO KAM RIVER, TANK OVERFLOW.	N	Water course or lake	0
@	21-Sep-92	THUNDER BAY CITY	TERMINAL YARD MISSION ISLAND			L	DIESEL FUEL	100	L	PETRO-CANADA-100 LITRES DIESEL FUEL TO GROUND DUE TO BROKEN PIPE.	N		99
@	13-Oct-92	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	15	L	MAINTAIR AVIATION: 15 L JET FUEL TO GROUND	N		100
@	19-Oct-92	THUNDER BAY CITY	1701 ARTHUR ST. E.	332678	5361122	L	GASOLINE			PETRO-CANADA: GASOLINE FOUND IN SOIL AT SERVICE STATION DECOMMISSION	C	Soil contamination	0
@	21-Oct-92	THUNDER BAY CITY	437 WEST ARTHUR STREET			L	GASOLINE			BACKENTRY - PETRO CANADA:GASOLINE CONTAMINATION FOUND AT SERVICE STATION	C	Soil contamination	0
@	22-Oct-92	THUNDER BAY CITY	610 HAROLD CRESCENT	333051	5362406	L	TRANSFORMER OIL (N.O.S.)	2	L	THUNDER BAY HYDRO -APPROX2L TRANSFORMER OIL LEAK. CLEANED UP.	N		99
@	26-Oct-92	THUNDER BAY CITY	620 MCBAIN ST	335126	5362522	L	TRANSFORMER OIL (N.O.S.)	70	L	THUNDER BAY HYDRO- 45-70LTRANSF. OIL TO ASPHALT DUE TO BROKEN POLE.	N		99

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@	29-Oct-92	THUNDER BAY CITY	TWIN CITY CROSSROADS ESSO			L	DIESEL FUEL	10	L	ESSO PETROLEUM CANADA: 5-10 L DIESEL FUEL TO GROUND	C	Soil contamination	100
@	4-Nov-92	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	BLACK LIQUOR	900	L	CPFP - BLACK LIQUOR TO KAM RIVER DUE TO PIPE RUPTURE.	C	Water course or lake	0
@	11-Nov-92	THUNDER BAY CITY				L	DIESEL FUEL	35	L	ONTARIO HYDRO - 35L DIESEL FUEL TO GROUND WHILE FILLING TRUCK.	N		99
@	15-Nov-92	THUNDER BAY CITY				LA	BLACK LIQUOR			C.P. FOREST PRODUCTS: BLACK LIQUOR VENTED TO AIR & PARKING LOT	P	Soil contamination	90
@	3-Dec-92	THUNDER BAY CITY	1 MAUREEN STREET			L	DIESEL FUEL	50	L	BACKENTRY - NORTHERN WOODPRESERVERS: 50 L DIESEL FUEL TO GROUND	N		100
@	18-Dec-92	THUNDER BAY CITY	GREAT WEST TIMBER MILL			L	DIESEL FUEL	50	L	GREAT WEST TIMBER MILL - 50 LITRE DIESEL SPILL TO LAND FROM TRUCK.	N		100
@	22-Dec-92	THUNDER BAY CITY	HWY # 527 23KM NORTH OF TRANS CANADA			LW	DIESEL FUEL	225	L	GRENIER & SONS - 225 L DIESEL FUEL TO HWY # 527 AND DITCH FROM TRUCK.	C	Soil contamination	75
@	23-Dec-92	THUNDER BAY CITY				L	SODIUM HYDROXIDE (SOL'N) (CAUSTIC SODA)	45	L	CANADIAN PACIFIC FOREST PRODUCTS: 45 L CAUSTIC TO GROUND	N		100
@	29-Dec-92	THUNDER BAY CITY	AT ABITIBI-PRICE ON SHIPYARD RD.			L	HYDROGEN PEROXIDE (AQUEOUS SOL'N)	225	L	ABITIBI-PRICE -225 L OF HYDROGEN PEROXIDE TO GROUND FROM RAIL CAR.	N	Other	100
9300000373	12-Jan-93	THUNDER BAY CITY	419 ARUNDEL STREET	338184	5370701	L	HYDRAULIC OIL	15	L	THUNDER BAY HYDRO: 15 L HYDRAULIC OIL TO GROUND FROM VEHICLE	N		100
9300000460	15-Jan-93	THUNDER BAY CITY	MISSION RIVER			W	GASOLINE	151372	L	PETRO-CANADA: 160 000 L GASOLINE LEAKEDFROM PIPING AT TERMINAL	C	Multi Media Pollution	95
9300000463	15-Jan-93	THUNDER BAY CITY	ABITIBI PRICE PROV. PAPERS DIVISION			L	LATEX	400	L	ABITIBI-PRICE-400 L OF LATEX TO GROUND. CLEANUP COMPLETE.	N		100
9300000631	21-Jan-93	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	DIESEL FUEL	135	L	MAINTAIR AVIATION: DIESELFUEL LEAK FROM TANK FARM	P	Soil contamination	90
9300000633	21-Jan-93	THUNDER BAY CITY	DAWSON RD.			L	ISOPHORONEDIAMINE	4	L	CP EXPRESS: LEAK OF 4L ISOPHORONEDIAMINE FROM PAIL IN TRUCK TO YARD	P	Soil contamination	95
9300001069	2-Feb-93	THUNDER BAY CITY	DAWSON ROAD			L	DIESEL FUEL		UKN	ATOMIC TRANSPORT-DIESEL FUEL TO GROUND FROM NOZZLE FALLING FROM TANK.	N		99
9300001440	16-Feb-93	THUNDER BAY CITY	BULK PLANT AT 300 106TH ST.	333993	5360182	L	DIESEL FUEL	45	L	PETRO CANADA - 45 L OF DIESEL FUEL TO CONCRETE AT LOADING RACK.	N		100
9300001458	17-Feb-93	THUNDER BAY CITY				L	HYDRAULIC OIL	5	L	T.C.P.L.-5 L HYDRAULIC OIL TO GRAVEL ROADWAY, CONTAINED,CLEANED-UP.	N		99
9300001605	21-Feb-93	THUNDER BAY CITY	440 SYNDICATE AVE	333602	5362269	L	RUST-INHIBITOR (N.O.S.)	29	L	CP-RAIL: 1125 L WATER CONTAINING RUST INHIBITOR(2.6%) TO GROUND.	N		85
9300001674	24-Feb-93	THUNDER BAY CITY	RONA AVE/LESLIE AVE	338508	5371549	L	HYDRAULIC OIL	15	L	THUNDER BAY HYDRO - 15L HYDRAULIC OIL TO ASPHALT FROM TRUCK. CLEANED UP.	N		99
9300001913	4-Mar-93	THUNDER BAY CITY	ARTHUR STREET HUSKY GAS STATION			L	GASOLINE	20	L	PRIVATE MOTOR VEHICLE - 20 L GASOLINE TO LAND FROM GAS TANK.	N		99
9300002381	17-Mar-93	THUNDER BAY CITY	HWY #102			L	DIESEL FUEL	5	L	DAWSON RD TRUCK STOP: 5 LDIESEL FUEL TO GROUND DURING FILLING.	N		99
9300002378	18-Mar-93	THUNDER BAY CITY				L	ETHYLENE GLYCOL (ANTIFREEZE)	50	L	CARGILL: 50 L GLYCOL TO GROUND FROM LOCOMOTIVE DUE TO LEAKING LINE.	N		25
9300002654	25-Mar-93	THUNDER BAY CITY				L	DIESEL FUEL	90	L	DAWSON ROAD TRUCK STOP - 80L DIESEL FUEL TO LAND DUE TO EQUIPMENT FAILURE.	N		99
9300002733	27-Mar-93	THUNDER BAY CITY	500 MACNAUGHTON AVE.			A	AMMONIA GAS (ANHYDROUS)		UKN	CANADIAN PACIFIC RAILWAYSANHYDROUS AMMONIA LEAK TOAIR FROM CAR SAFETY VALVE	P	Air Pollution	0
9300002887	30-Mar-93	THUNDER BAY CITY	MILE 52 SPRUCE RIVER RD.			L	WASTE OIL	180	L	ABITIBI-PRICE: 180L WASTEOIL TO GROUND ON CROWN LAND. OCCURRED IN FEB.	C	Soil contamination	0
9300003232	7-Apr-93	THUNDER BAY CITY	KAM RIVER			W	HYDRAULIC OIL	410	L	C.P.F.P.-410 L HYDRAULIC OIL TO STORM SEWER AND KAMINISTIQUIA RIVER.	P	Water course or lake	0
9300003330	9-Apr-93	THUNDER BAY CITY	1451 MOUNTAIN RD. JAMES ROSE RESIDENCE, TEL #473-9812	327518	5355033	L	FURNACE OIL	800	L	PRIVATE RESIDENCE- -800 LOF FURNACE OIL TO LAND AND BASEMENT FROM TANK.	P	Soil contamination	98
9300003342	9-Apr-93	THUNDER BAY CITY	ABITIBI PRICE PROV. PAPERS DIVISION			W	POLYMER EMULSION	1500	L	ABITIBI-PRICE - 1500 L OFPOLYMER TO LAGOON WHEN TANK WAS OVERFILLED.	N		0
9300003655	16-Apr-93	THUNDER BAY CITY	815 MACDONELL ST. BUILTRITE CASH & CARRY			L	MOTOR OIL	50	L	DOW'S CHEMICAL -1000 LTR OIL DRUM FELL FROM TRUCK.50 LTR ROAD & DITCHES.	N	Water course or lake	98
9300003810	20-Apr-93	THUNDER BAY CITY	HWY 527 3 KM NORTH OF HWY 11/17			L	TALL OIL (TALLOL) (LIQUID ROSIN)	2	L	TANK TRUCK TRANSPORT - 2 L OF BROWN SUBSTANCE TO PARKING AREA	P	Soil contamination	75
9300012652	28-Apr-93	THUNDER BAY CITY	OPPOSITE HARDISTY ST.			L	GASOLINE	2	L	BACKENTRY-CP RAIL: 2L GASOLINE LEAK FROM EMPTY RAIL CAR TO TRACKS	N		0
9300004754	8-May-93	THUNDER BAY CITY				L	UNKNOWN	3.5	M3	BOMBARDIER INC.-SITE REM-EDIATION UNCOVERED CONCR-ETE TANK UNKNOWN WASTE.	C	Soil contamination	90

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9300004929	11-May-93	THUNDER BAY CITY				L	MINERAL OIL (LT 50 PPM PCB)	10	L	ONT HYDRO: 10 L MINERAL OIL TO LAND WHEN BACKHOE KNOCKED DOWN TRANSFORMER.	N		99
9300004962	12-May-93	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	GASOLINE	40	L	PETRO-CANADA - 40L GASOLINE TO APRON DUE TO DRIVER ERROR.	N		99
9300005079	14-May-93	THUNDER BAY CITY	HWY 61 & NEEBING ROAD			L	CONTAMINATED SOIL	3	M3	PROCTOR & REDFERN-3 M3 CONTAMINATED SOIL TO ROAD,CONTAINED,CLEANED-UP.	N		99
9300005397	20-May-93	THUNDER BAY CITY	CORNER OF JOHN ST./MAPLE AND CORNER OF JOHN ST./VALLEY ST.			L	CONTAMINATED SOIL	5	M3	PROCTER & REDFERN-SPILL OF CONTAMINATED SOIL TO STREET, CLEANED.	N		90
9300005674	28-May-93	THUNDER BAY CITY				L	HYDRAULIC OIL	90	L	CARGILL LTD. - 90 L OF HYDRAULIC OIL TO GROUND FROM AUGER.	C	Soil contamination	100
9300005887	2-Jun-93	THUNDER BAY CITY	HAMMOND & HARBOUR EXPRESSWAY			L	HYDRAULIC OIL	25	L	BRUCE HALO CONST. - 25 L OF HYDRAULIC OIL TO GROUND	C	Soil contamination	80
9300006108	7-Jun-93	THUNDER BAY CITY				L	GASOLINE	20	L	PETRO-CANADA BULK PLANT - 20 L OF GASOLINE TO CEMENT WHEN FILLING TRUCK	N		100
9300006271	9-Jun-93	THUNDER BAY CITY	MOUNTDALE YARD			L	GASOLINE		UKN	MTO: GASOLINE TO GROUND FROM LEAKING UNDERGROUND STORAGE TANK LINE.	C	Soil contamination	75
9300006245	10-Jun-93	THUNDER BAY CITY	MACINTYRE & NORTH CUMBERLAND STREET	336646	5367923	L	TRANSFORMER OIL	260	L	PRIVATE OWNER-260 LITERS NON-PCB TRANSFORMER OIL TO LOT,SMALL QTY TO SEWER	P	Water course or lake	0
9300006269	10-Jun-93	THUNDER BAY CITY	205 BURWOOD RD			L	GASOLINE	10	L	ONTARIO HYDRO: 10 L GASOLINE TO GROUND WHILE REFUELING TRUCK.	C	Soil contamination	99
9300006329	11-Jun-93	THUNDER BAY CITY	CORNER OF BROCK & FREDRICKA ST.			L	GASOLINE	5	L	5 L OF GASOLINE POURED ON ROAD AND DOWN SANITARYSEWER BY PRIVATE CITIZEN.	N		50
9300006356	12-Jun-93	THUNDER BAY CITY	ARMSTRONG BASE			L	AVIATION FUEL (JET A OR B, TURBO)	5	L	MNR: < 5 L JET B FUEL TO GROUND FROM FAULTY PUMP ON STORAGE TANK.	P	Soil contamination	0
9300006533	16-Jun-93	THUNDER BAY CITY	DAWSON RD			L	DIESEL FUEL	50	L	50 LTR DIESEL TO TRUCK STOP INTERCEPTOR WHEN NOZZLE FELL OUT OF TRUCK.	N		100
9300006792	21-Jun-93	THUNDER BAY CITY	81 NORTH CUMBERLAND STREET	336100	5367270	L	DIESEL FUEL	45	L	MARTIN & BROWER: 45 L DIESEL FUEL TO PAVED PARKING LOT	C	Soil contamination	100
9300006877	22-Jun-93	THUNDER BAY CITY	SELKIRK TERMINALS			L	GASOLINE	225	L	SELKIRK TERMINALS-225 L GASOLINE TO TARMAC,LEAK IN HOSE,EVAPORATED,MCCR.	P	Air Pollution	0
9300007253	30-Jun-93	THUNDER BAY CITY	MISSION ISLAND BULK TERMINAL			L	FURNACE OIL	10	L	PETRO-CANADA: 10L COLOURED DIESEL FUEL LEAKAT BULK STATION	P	Soil contamination	90
9300007798	11-Jul-93	THUNDER BAY CITY	KAMINISTIQUIA RIVER CP RAIL MOTOR SHOP BEHIND HARDISTY ST.			W	OILY WATER (N.O.S.)		UKN	CP RAIL-OIL/WATER SEPARA-TOR OVERFLOW, RAIN, 3 M2 SLICK IN KAMINISTIQUIA R.	N		98
9300008012	15-Jul-93	THUNDER BAY CITY	LAKE ONTARIO POOL 7B GRAIN ELEVATOR, TB HARBOUR			W	HEAVY OIL (N.O.S.)	45	L	MV WINNIPEG: 45L HEAVY OIL LEAK TO LAKE ONTARIO	P	Water course or lake	0
9300008017	15-Jul-93	THUNDER BAY CITY	101 WEST ARTHUR ST.			L	HYDROCHLORIC ACID (MURIATIC ACID)	22	L	LAKEHEAD FREIGHTWAYS: 22LHYDROCHLORIC ACID TO GROUND FROM PAIL	P	Soil contamination	90
9300008300	23-Jul-93	THUNDER BAY CITY	545 MEMORIAL AVE.	334365	5365349	L	MOTOR OIL	4	L	BACKENTRY-MOTOR OIL TO ROADWAY FROM LEAKING OIL FILTER.	C	Soil contamination	90
9300008511	28-Jul-93	THUNDER BAY CITY	1 POLESPAN SOUTH OF 5225 LOCH LOMAN RD.			L	HYDRAULIC OIL	10	L	THUNDER BAY HYDRO-10 L OFHYDRAULIC OIL TO GROUND, CONTAINED.	C	Soil contamination	90
9300008630	30-Jul-93	THUNDER BAY CITY				W	EFFLUENT (NOT OTHERWISE SPECIFIED)	200	M3	TECK CORUNNA-EFFLUENT FROM FINAL EFFLUENT PIPELINE.	P	Soil contamination	0
9300008780	3-Aug-93	THUNDER BAY CITY	815 FORT WILLIAM ROAD	334255	5364046	L	DIESEL FUEL	17	L	GREYHOUND-17L DIESEL FUELTO LAND WHILE FUELING: BROKEN HOSE FITTING	N		99
9300008981	7-Aug-93	THUNDER BAY CITY	AT B&J EQUIPMENT RENTAL AT 250 DOG LAKE RD.	328465	5373264	L	DIESEL FUEL	4500	L	B&J EQUIPMENT RENTALS - 4500 L OF DIESEL FUEL TO GROUND FROM TANK TRUCK	C	Soil contamination	0
9300009080	10-Aug-93	THUNDER BAY CITY				W	DYE N.O.S.	30	L	PROVINCIAL PAPERS INC.: 30 L DYE TO LAGOON SYSTEM	N	Water course or lake	0
9300009094	10-Aug-93	THUNDER BAY CITY	JACKKNIFE BRIDGE AT 106TH STREET			L	GASOLINE		UKN	PRIVATE MOTOR VEHICLE - GASOLINE TO 15 METRE STRETCH OF BRIDGE	N		99
9300009286	14-Aug-93	THUNDER BAY CITY	205 PICTON	332951	5368106	L	GASOLINE			PRIVATE BOAT: GASOLINE SPILLED TO ROAD FROM LEAKY OUTBOARD MOTOR	N		100
9300009426	18-Aug-93	THUNDER BAY CITY	579 MAUREEN STREET			L	WATER		UKN	CANADA MALTING: WATER WITH SOME FOAM TO GROUND FROM BACKED UP SEWER.	N	Soil contamination	0
9300009649	21-Aug-93	THUNDER BAY CITY	361 HODDER AVENUE	338655	5370148	L	OILY WATER (N.O.S.)	200	L	200 L LIQUID DUMPED BEHIND MARKET	C	Soil contamination	0
9300009727	23-Aug-93	THUNDER BAY CITY				A	HYDROGEN CHLORIDE GAS (ANHYDROUS)	20	KG	OGILVIE MILLS 20 KG OF HYDROGEN CHLORIDE TO AIR FROM RUPTURED LINE.	N	Other	0
9300010204	1-Sep-93	THUNDER BAY CITY	2ND CONCESSION EAST OFF MAPLEWOOD RD NORTH OF HWY 102			LW	DIESEL FUEL	20	L	MACDONALD FUELS-20 LITERSDIESEL FUEL TO SWAMP AREATRUCK OVERTURN,CLEANED-UP	P	Multi Media Pollution	80

Table H-4
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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9300010349	5-Sep-93	THUNDER BAY CITY	KAMINSTIQUIA RIVER			W	BLACK LIQUOR	200	L	CDN PACIFIC FOREST - UNK QTY BLACK LIQUOR TO RIVER:RUPTURED RETURN LINE	P	Water course or lake	0
9300010682	14-Sep-93	THUNDER BAY CITY				L	GROUND WOOD STOCK		UKN	ABITIBI-PRICE INC. - GROUNDWOOD FIBRE & WATER OVERFLOW TO PARKING LOT	N		80
9300010892	18-Sep-93	THUNDER BAY CITY	ALONG CUMBERLAND ST. TO RIVER ST.			L	DIESEL FUEL		UKN	DIESEL FUEL SPILT ALONG ROADWAY FROM UNKNOWN SOURCE.	C	Other	100
9300011088	25-Sep-93	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	HIGH PH EFFLUENT (N.O.S.)			CPFP: 1 HR PH EXCURSION WHEN CAUSTIC TANK OVERFLOWED. PEAKED AT 10.	P	Water course or lake	0
9300011157	26-Sep-93	THUNDER BAY CITY	915 RED RIVER ROAD	333623	5368518	L	GASOLINE	2	L	SEVEN ELEVEN GAS BAR- 2L GASOLINE TO GROUND DUETO HOSE SPLIT,CLEANED.	P	Multi Media Pollution	90
9300011257	29-Sep-93	THUNDER BAY CITY	ALLOY DR.			L	HYDRAULIC OIL	50	L	BFI - 50 L OF HYDRAULIC OIL TO ROAD FROM HOSE	N		90
9300011336	1-Oct-93	THUNDER BAY CITY	ARTHUR & JAMES ST. CANADIAN TIRE			L	GASOLINE	15	L	PAUL'S HAULING - 15 L OF GASOLINE TO THE PAVEMENT WHILE FILLING TANK	N		90
9300011416	4-Oct-93	THUNDER BAY CITY	LAKE SUPERIOR			W	CANOLA OIL	25	L	THUNDER BAY TERMINALS- 25 LITRES OF CANOLA OIL TO WATER AT LOADING DOCK.	P	Water course or lake	90
9300011495	6-Oct-93	THUNDER BAY CITY	249 WINDSOR AVE.	333076	5367929	L	FURNACE OIL	5	L	RESIDENT: 5L FURNACE OIL LEAK FROM TANK TO GROUND	P	Soil contamination	100
9300011532	7-Oct-93	THUNDER BAY CITY	1020 PACIFIC AVE ESSO BULK STATION.	335670	5362706	LA	GASOLINE	250	L	IMPERIAL OIL - 250L GASO-LINE ONTO CONCRETE AT BU-LK STN, OVERFILLING TRUCK	N		90
9300012491	4-Nov-93	THUNDER BAY CITY	220 VICTORIA AVE EAST.			L	DIESEL FUEL	45	L	BEATRICE FOODS -45L DIESEL FUEL TO ASPHALT FROM SADDLE TANK, FD, WORKS.	N		99
9300012615	8-Nov-93	THUNDER BAY CITY	PETRO CANADA TERMINAL			L	DIESEL FUEL	180	L	SHELL-180L DIESEL FUEL TO LAND: DRIVER ERROR DURING MCCR PROVING OF TRUCK	C	Soil contamination	99
9300012637	8-Nov-93	THUNDER BAY CITY	KAMINISTIQIA RIVER			LW	PHENOLIC RESINS	200	KG	NESTE RESINS-250 KG WATER/PHENOLIC RESIN MIX TO KAM RIVER,FAILED VALVE.	P	Water course or lake	0
9300012934	16-Nov-93	THUNDER BAY CITY	CP RAIL YARD NEAR HARDESTRY AND DONALD			L	NICKEL SULFATE			CANADIAN PACIFIC - NICKEL SULPHATE TO GROUND FROM LEAKING BOXCAR	P	Human health	95
9300012980	17-Nov-93	THUNDER BAY CITY	HIGHWAY 17, 400FT WEST OF MCKELLAR CREEK			L	DIESEL FUEL	120	L	TRANSPORT TRUCK - 120 L DIESEL FUEL TO HIGHWAY 17 DITCH: TRUCK OVERTURNED	P	Soil contamination	0
9300012992	17-Nov-93	THUNDER BAY CITY	ON BEAVERHALL PLACE			L	HYDRAULIC OIL	25	L	C.P. FOREST PRODUCTS - 25 L OF HYDRAULIC OIL TO RD. & GRD. FROM CATERPILLAR	P	Soil contamination	100
9300013515	2-Dec-93	THUNDER BAY CITY				LA	BLACK LIQUOR			C.P. FOREST PRODUCTS - BLACK LIQUOR VENTED TO PARKING LOT & CARS	P	Air Pollution	75
9300013668	7-Dec-93	THUNDER BAY CITY	NEEBING AV			L	BLACK LIQUOR		UKN	C.P.F.P.-UKN QTY BLACK LIQUOR TO PARKING LOT ANDAUTOS,FLASH TANK OVERFLOW	C	Multi Media Pollution	95
9300014335	30-Dec-93	THUNDER BAY CITY	LAKE SUPERIOR			W	DIESEL FUEL			ONTARIO HYDRO- 4500 L # 2 DIESEL TO BASEMENT, CONTAINED.	C	Water course or lake	95
9400000064	3-Jan-94	THUNDER BAY CITY	NEEBING AV			LA	BLACK LIQUOR		UKN	C.P.F.P.-UKN QTY BLACK LIQUOR TO ATM & PARKING LOT, RUPTURED DISC.	C	Multi Media Pollution	10
9400000149	6-Jan-94	THUNDER BAY CITY	LAKE SUPERIOR			W	ETHYLENE GLYCOL (ANTIFREEZE)	810	L	ABITIBI-PRICE - 810 L ETHYLENE GLYCOL FROM MILLTO SEWER & LAKE SUPERIOR.	P	Water course or lake	0
9400000944	31-Jan-94	THUNDER BAY CITY	SHIPYARD RD			L	HYDROGEN PEROXIDE (8 TO 60%)	110	L	PROVINCIAL PAPERS INC. 110 L HYDROGEN PEROXIDE TO GRD. FROM RAIL CAR	N		0
9400000945	31-Jan-94	THUNDER BAY CITY	SHIPYARD RD			L	HYDROGEN PEROXIDE (8 TO 60%)	110	L	PROVINCIAL PAPERS INC. 110 L HYDROGEN PEROXIDE TO GRD. FROM RAIL CAR	N		0
9400001063	2-Feb-94	THUNDER BAY CITY	LAKE SUPERIOR			W	POLYMER EMULSION	2000	L	PROVINCIAL PAPERS - 2000 L OF ANIONIC POLYMER TO LAKE SUPERIOR.	N		0
9400001191	8-Feb-94	THUNDER BAY CITY	ESSO STATION \@MEMORIAL & 8TH AVENUE			L	GASOLINE	50	L	ESSO SERVICE STN - 50L GASOLINE TO PREMIUM SUB- MERGED PUMP WELL	N		0
9400001220	9-Feb-94	THUNDER BAY CITY	1475 WEST ARTHUR ST.	331119	5361183	L	ETHYLENE GLYCOL (ANTIFREEZE)	5	L	PRIVATE AUTO - 5 L OF ANTIFREEZE TO ROAD DUE TOACCIDENT.	N		100
9400001325	13-Feb-94	THUNDER BAY CITY	TOTEM TRAILER COURT			L	FURNACE OIL		UKN	PRIVATE RESIDENCE-UKN QTYFURNACE OIL TO GROUND, PARTIAL CLEANUP BY FD.	P	Multi Media Pollution	0
9400001330	13-Feb-94	THUNDER BAY CITY	LAKE SUPERIOR			W	POLYMER EMULSION	750	KG	PROVINCIAL PAPERS - 750 KG OF STYRANOL TO SEWER AND CLARIFIER	P	Water course or lake	0
9400001465	17-Feb-94	THUNDER BAY CITY	3106 STREET			L	GASOLINE	7	L	PETRO-CANADA: 7L GASOLINELEAKED TO GROUND FROM LOADING ARM.	N		100
9400001535	18-Feb-94	THUNDER BAY CITY	WALSH STREET			L	DIESEL FUEL	180		THUNDER BAY AIRPARK: 180 L DIESEL FUEL TO LAND	N		0
9400001743	22-Feb-94	THUNDER BAY CITY				L	GASOLINE	5	L	PETRO-CANADA BULK PLANT - 5 L OF GASOLINE TO CEMENT WHEN FILLING TRUCK	N		100
9400001764	23-Feb-94	THUNDER BAY CITY	PETRO-CANADA TERMINAL			L	DIESEL FUEL	4	L	PETRO-CANADA-4L DIESEL TO LAND,CLEANED UP.	N		0
9400001820	24-Feb-94	THUNDER BAY DISTRICT				L	DIESEL FUEL	430	L	ABITIBI-PRICE - 430 L OF DIESEL FUEL TO GRAVEL- COVERED INTERNAL ROAD.	P	Soil contamination	0

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9400001824	24-Feb-94	THUNDER BAY CITY	AT THE NEEBING RAIL YARD			L	DIESEL FUEL	2250	L	C.N. RAIL - 2250 L OF DIESEL FUEL TO GROUND AT LOCOMOTIVE FUELING DEPOT.	P	Soil contamination	0
9400001888	27-Feb-94	THUNDER BAY CITY	NEEBING YARD.			L	DIESEL FUEL	225	L	C.N.NORTH AMERICAN-227 L DIESEL FUEL TO TRACKS, CONTAINED,CLEANUP ONGOING	N		0
9400002105	5-Mar-94	THUNDER BAY CITY	MISSION RIVER			W	PETROLEUM OIL (N.O.S.)		UKN	FUEL OIL IN MISSION RIVERFROM UNKNOWN SOURCE. ONT.HYDRO INTAKE IMPACTED.	C	Water course or lake	0
9400002259	11-Mar-94	THUNDER BAY CITY				L	DIESEL FUEL	810	L	THUNDER BAY TERMINALS: 787-810 L DIESEL FUEL TO GROUND FROM STORAGE TANK.	P	Soil contamination	75
9400002279	11-Mar-94	THUNDER BAY CITY	PETRO-CANADA TERMINAL, 300 106TH ST. MISSION ISLAND			L	DIESEL FUEL	10	L	PETRO-CANADA -10L DIESEL TO SNOW FROM PIPELINE, BROKEN DUST CAP.	N		0
9400002706	22-Mar-94	THUNDER BAY CITY				LW	POLYMER EMULSION	5	T	ABITIBI-PRICE - 5 TONNES OF POYMIN SK TO GROUND AND SEWER SYSTEM	P	Water course or lake	0
9400002956	30-Mar-94	THUNDER BAY CITY	LAKESHORE DRIVE			L	HYDRAULIC OIL	25	L	ONTARIO HYDRO-25L HYDRAU-LIC OIL TO GROUND, BROKENBACKHOE HOSE, CLEANED UP.	C	Soil contamination	99
9400003285	7-Apr-94	THUNDER BAY CITY				L	DIESEL FUEL	5	L	TRANSPORT TRUCK-5 LITERS DIESEL FUEL TO CONCRETE PAD,SADDLE TANK OVERFILL.	N		99
9400003415	10-Apr-94	THUNDER BAY CITY	BESIDE 131 MACHAR ST\\	335047	5366414	L	FUEL OIL			TANK TRUCK - LEAKING FUELOIL ONTO GROUND AND NEIGHBOURS PROPERTY	C	Soil contamination	0
9400003439	10-Apr-94	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	WATER (BASIC, IE: HIGH PH)	1500	M3	AVENOR INC-1 HOUR PH EXCEEDANCE OF EFFLUENT TOKAMINISTIQUIA RIVER.	P	Water course or lake	0
9400003962	22-Apr-94	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	GASOLINE	15	L	PETRO-CANADA - 15 L GASO-LINE TO GROUND, LEAKED ASPUMP WAS BEING REPAIRED	N		99
9400004076	25-Apr-94	THUNDER BAY CITY	WEBEQUIE SCHOOL, 300 MILES NORTH EAST OF TB, LATITUDE 5300, LONGITUDE 8700.			L	FURNACE OIL	1125	L	WEBEQUIE FIRST NATIONS - FURNACE OIL TO SNOW AND GROUND AROUND STORAGE TK.	C	Multi Media Pollution	0
9400004077	25-Apr-94	THUNDER BAY CITY	NORTH NIPIGON, CLOSE TO ORIENT BAY			L	DIESEL FUEL	6.8	M3	CNR: DERAILMENT, DIESEL LEAKED TO GROUND, UKN AMTTO THE BAY, OPP ON SITE	P	Multi Media Pollution	
9400004080	25-Apr-94	THUNDER BAY CITY	KINGFISHER LAKE AIRPORT, MTO			W	DIESEL FUEL	360	L	MTO: 360 L DIESEL FUEL SPILLED INTO MTO DITCH, WILL CLEAN UP	P	Soil contamination	
9400004487	5-May-94	THUNDER BAY CITY	645 MOUNTDALE	330006	5360686	L	DIESEL FUEL	10	L	TOM MACDONALD FUELS - DIESEL FUEL TO GROUND WHILE FILLING TANKS	N		
9400004594	7-May-94	THUNDER BAY CITY	FOOD WAREHOUSE CORNER OF FREDERICA AND \@EDWARD ST	331242	5359385	W	WATER/SEDIMENT		UKN	FOOD WAREHOUSE: WATER WITH FOUL SMELLING WASTE TO CITY SEWER	N	Other	0
9400005286	10-May-94	THUNDER BAY CITY	KINGFISHER LAKE			L	DIESEL FUEL	900	L	BACKENTRY,MTO:900L DIESELFUEL OVERFLOWED INSIDE OFBERM-CONTAINED	N		100
9400004773	12-May-94	THUNDER BAY CITY	MARTEN FALLS INDIAN RESERVE, 120 MILES NORTH OF GERALTON			L	FUEL OIL	20000	L	MARTEN FALLS RESERVE:EST.20,000 L FUEL OIL TO GROUND DURING WINTER.EPS	C	Soil contamination	0
9400004830	13-May-94	THUNDER BAY CITY	LAKE SUPERIOR			W	POLYSTYRENE	450	L	PROVINCIAL PAPERS - 450 LOF STYRANOL TO LAKE SUPERIOR, TANK OVERFILL.	N		0
9400005076	20-May-94	THUNDER BAY CITY	ARTHUR AND SYNDICATE STREETS	333573	5361070	L	GASOLINE	20	L	CENTRAL CANADA FUELS-20 LGASOLINE TO CONCRETE PAD DURING DELIVERY,CLEANEDUP	N		0
9400005086	20-May-94	THUNDER BAY CITY	PETRO-CANADA TERMINAL			L	DYE N.O.S.	10	L	PETRO-CANADA: 10 L DYE ON CEMENT CONTAINMENT DIKE, CLEANED UP	N		100
9400005449	28-May-94	THUNDER BAY CITY	LAKE SUPERIOR NORTH END OF THUNDER BAY HARBOUR			W	OILY MATERIAL N.O.S.		UKN	SOURCE UNKNOWN-MEDIUM OILSHEEN IN HARBOUR AT NORTHEND,CCG,MOEE.	P	Water course or lake	0
9400006415	18-Jun-94	THUNDER BAY CITY	AVENOR INC(CANADIAN PACIFIC FOREST)			LW	METHANOL	480	L	CANADIAN PACIFIC PRODUCTS: 480 L 80% METHANOL TO GRD, TO DITCH,CONTAINED	P	Multi Media Pollution	95
9400006419	18-Jun-94	THUNDER BAY CITY	POLE TRANSFORMER IN FRONT OF 282-286 WOSELEY ST.			L	MINERAL OIL (LT 50 PPM PCB)	25	L	THUNDER BAY HYDRO - 25 L OF NON-PCB OIL TO GROUND FROM POLE TRANSFORMER.	P	Soil contamination	0
9400007529	11-Jul-94	THUNDER BAY CITY	DAWSON RD. & TOWNLINE RD.	320671	5374367	L	DIESEL FUEL	450	L	TRANSPORT TRUCK ACCIDENT:450L DIESEL FUEL LEAK TO ROAD	P	Soil contamination	0
9400007812	17-Jul-94	THUNDER BAY CITY	NEEBING AVENUE			W	FOAM			AVENOR INC.: 8 MIN FOAM FROM OUTFALL TO KAM RIVERTURNBASIN.	N	Water course or lake	0
9400007961	21-Jul-94	THUNDER BAY CITY	300 106TH ST.	333993	5360182	L	GASOLINE	8	L	PETRO-CANADA BULK PLANT - 8 L OF GASOLIINE TO GROUND FROM TANK TRUCK.	N		100
9400008054	22-Jul-94	THUNDER BAY CITY	108 TH AVENUE			L	ALKALINE SOLUTION (N.O.S)	180	L	ONTARIO HYDRO-130-180 L ALKALINE LIQUID TO GROUNDCONTAINED.	P	Soil contamination	0
9400008322	29-Jul-94	THUNDER BAY CITY	CURRENT RIVER CREEK, FEW KMS NORTH OF THUNDER BAY			W	AVIATION FUEL (JET A OR B, TURBO)	22	L	PRIVATE OWNER - 22L AVIA-TION FUEL TO CREEK WHEN SMALL AIRCRAFT CRASHED.	P	Water course or lake	0
9400008522	29-Jul-94	THUNDER BAY CITY	MEMORIAL AVE., ON-RAMP TO HARBOUR EXPRESSWAY.	333821	5363942	L	HYDRAULIC OIL	90	L	BACKENTRY-UNKNOWN SOURCE-70-90 L HYDRAULIC FLUID TO ROAD,CLEANED UP.	C	Other	85
9400009020	17-Aug-94	THUNDER BAY CITY				L	DIESEL FUEL	40	L	CENTRAL CANADA FUELS-40 LDIESEL FUEL FROM OVERFILLOF TRUCK,30 L RECOVERED.	N		0

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9400009112	19-Aug-94	THUNDER BAY CITY	OLIVER,GOLF LINKS,ROCKWOOD STREETS.			L	DIESEL FUEL		UKN	TRUCK-UKN QTY DIESEL FUELTO VARIOUR ROADS,FD,WORKSRESPONDED,SOME TO SEWERS	P	Multi Media Pollution	0
9400009153	20-Aug-94	THUNDER BAY CITY	THUNDER BAY HARBOUR			W	CREOSOTE		UKN	UNKNOWN QUANTITY-CREOSOTESURFACED FROM BOTTOMOF HARBOUR,NO RECOVERY.	P	Water course or lake	0
9400009549	24-Aug-94	THUNDER BAY CITY	KAMINISTIKWIA RIVER			W	PETROLEUM OIL (N.O.S.)	6	L	BACKENTRY-OGILVIE MILLS - 6 L OF COMPRESSOR OIL TO THE KAMINISTIKWIA R.	C	Water course or lake	0
9400009811	4-Sep-94	THUNDER BAY CITY	MISSION RIVER			W	OILY MATERIAL N.O.S.		UKN	SOURCE UNKNOWN-VERY SLIGHT OIL SHEEN ON RIVER,POSSIBLE ROAD RUNOFF.	P	Water course or lake	0
9400010081	13-Sep-94	THUNDER BAY CITY	STURGEON BAY ROAD OFF HIGHWAY 61.			L	DIESEL FUEL		UKN	TRANSPORT TRUCK-OVERTURN AND SPILL OF DIESEL FUEL TANKS TO LAND.	P	Soil contamination	
9400010227	16-Sep-94	THUNDER BAY CITY	#1 PORT ARTHUR T.S. ON LAKESHORE DRIVE.			L	TRANSFORMER OIL	1365	L	ONTARIO HYDRO,PORT ARTHURT.S.-1365 TRANSFORMER OILTO GRAVEL, CLEANING UP.	C	Soil contamination	0
9400010309	17-Sep-94	THUNDER BAY CITY	106TH STREET			L	GASOLINE	20	L	PETRO-CANADA: 20 L GAS TO GROUND	N		100
9400010312	18-Sep-94	THUNDER BAY CITY	FORT WILLIAM ROAD AT MEMORIAL \@ED'S TRIANGLE SERVICE			L	GASOLINE	25		TANK TRUCK SPILLED 25 L GASOLINE TO GROUND	N		100
9400010314	18-Sep-94	THUNDER BAY CITY	335 TOLEDO STREET	336652	5369724	L	TRANSFORMER OIL	25	L	THUNDER BAY HYDRO: 25 L OIL TO GROUND	N		100
9400010323	19-Sep-94	THUNDER BAY CITY				L	FURNACE OIL	150	L	MACDONALD FUELS-150 L FURNACE OIL TO SEPARATOR,CONTAINED,CLEANED-UP.	N		0
9400010332	19-Sep-94	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	DIESEL FUEL	50	L	PETRO-CANADA - 50 L. CLEAR DIESEL TO GROUND, CUSTOMER OVERFLOWED TANK	N		0
9400010343	19-Sep-94	THUNDER BAY CITY	KAM RIVER			W	BLACK LIQUOR	450	L	AVENOR INC-450L BLACK LI-QUOR TO KAM RIVER CAUSINGFOAM, AIR LINE RUPTURE.	P	Water course or lake	0
9400010642	27-Sep-94	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	BLACK LIQUOR			AVENOR INC.: BLACK LIQUOR TO RIVER	C	Water course or lake	0
9400010838	2-Oct-94	THUNDER BAY CITY	KAMINISTIQUIA RIVER, WEST OF KAKABEKA FALLS			LW	AVIATION FUEL (JET A OR B, TURBO)	150	L	PRIVATE AIRCRAFT: 150 L AIRCRAFT FUEL TO GROUND AND RIVER	P	Multi Media Pollution	0
9400010921	5-Oct-94	THUNDER BAY CITY	SUNNY'S GAS BAR, COUNTY FAIR PLAZA			L	GASOLINE		UKN	SUNNY'S GAS BAR.: LEAK DISCOVERED IN UNDERGROUNDSTORAGE TANK BY CITY.	C	Soil contamination	0
9400010983	6-Oct-94	THUNDER BAY CITY				L	TRANSFORMER OIL	15	L	ONTARIO HYDRO-15 L NON- PCB OIL TO GROUND,BUSHINGBROKEN WHILE MOVING UNIT.	N		0
9400011080	8-Oct-94	THUNDER BAY CITY	KAMINISTIQUIA RIVER			LW	TALLOW	180	L	AVENOR INC.-180 L TALLOW TO GROUND,SEWER AND SOME TO RIVER.	P	Water course or lake	
9400011587	24-Oct-94	THUNDER BAY CITY	HWY 11-17 22 KM WEST OF THUNDER BAY.			L	DIESEL FUEL	250	L	BELMORE TRUCKING-250 L DIESEL FUEL TO DITCH.	P	Soil contamination	0
9400011662	26-Oct-94	THUNDER BAY CITY				L	GASOLINE	20	L	PETRO-CANADA AGENT: 20 L GASOLINE OVERFLOWED TO GROUND AT BULK PLANT.	N		100
9400011829	31-Oct-94	THUNDER BAY CITY	MISSION ISLAND TERMINAL, 300 106TH ST.	333993	5360182	L	GASOLINE	25	L	SHELL CANADA-25L GASOLINETO CEMENT & OIL SEPARATORAT PETRO-CANADA TERMINAL	N		40
9400012344	15-Nov-94	THUNDER BAY CITY	ESSO TRUCK STOP, HIGHWAY 102			L	PAINT OR PAINT RELATED N.O.S.	5	L	REIMER EXPRESS LINES - SMALL QTY BARRIER COAT TOGRAVEL AT TRUCK STOP	P	Soil contamination	100
9400012606	24-Nov-94	THUNDER BAY CITY	LAKE SUPERIOR			W	ETHYLENE GLYCOL (ANTIFREEZE)	675	L	PROVINCIAL PAPERS- 675 L OF GLYCOL TO L. SUPERIOR DUE TO PUMP FAILURE.	N		0
9400012781	30-Nov-94	THUNDER BAY CITY	HWY 117 AND HWY 102 INTERSECTION			L	DIESEL FUEL	90	L	ATWAY TRANSPORT: 90 L DIESEL TO HWY SHOULDER & DITCH; CLEANING UP	P	Soil contamination	0
9400012829	2-Dec-94	THUNDER BAY CITY	MISSION ISLAND, PETROCAN BULK STATION			L	GASOLINE ADDITIVE (N.O.S.)	113	L	TRIMAC:113L FUEL ADDITIVETO GROUND VIA BROKEN HOSE;BEING CLEANED-UP	P	Soil contamination	0
9400013026	8-Dec-94	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	GASOLINE	10	L	PETRO-CANADA- 10 L GASOLINE TO CEMENT PAD, CONTAINED, CLEANED.	N		
9400013111	11-Dec-94	THUNDER BAY CITY	161 MAIN STREET			L	1,1,1,-TRICHLOROETHANE	20	L	MANITOULIN TRANSPORT: 20 L TRICHLORETHANE TO LOADING DOCK AREA	P	Air Pollution	0
9400013495	24-Dec-94	THUNDER BAY CITY	330 NORTH SYNDICATE	333618	5361906	L	GASOLINE	90	L	PRIVATE: 90 L GASOLINE TO GROUND FROM FUEL TANK.CLEANED UP BY WORKS.	N		100
9500000039	3-Jan-95	THUNDER BAY CITY	300 - 106 ST	333993	5360182	L	DIESEL FUEL	6	L	PETRO-CANADA-6 L DIESEL FUEL TO FROZEN GROUND CONTAINED, CLEANED UP.	N		0
9500000112	6-Jan-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	GASOLINE	3	L	PETRO-CANADA-3L GASOLINE TO CEMENT PAD, NO DRAINS,CONTAINED & CLEANED UP	N		99
9500000150	7-Jan-95	THUNDER BAY CITY	PETRO-CANADA TERMINAL			L	GASOLINE	5	L	PETRO-CANADA:5 L REGULAR GASOLINE TO CEMENT PAD, CONTAINED & CLEANED UP.	N		95
9500000565	18-Jan-95	THUNDER BAY CITY	NEAR BEAVER LUMBER ON MEMORIAL AVE			L	TRANSFORMER OIL (GT 50 PPM PCB)	UKN		THUNDER BAY HYDRO-UNKNOWNAMOUNT PCB TRANSFORMER OILTO CONCRETE,CAUSE UNKN.	P	Soil contamination	0

Table H-4
Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9500001675	27-Feb-95	THUNDER BAY CITY	CNR NEEBING YARD.			L	DIESEL FUEL	450	L	CANADIAN NATIONAL RAILWAY-450 L DIESEL ONTO SNOW, RAILWAY BUNK CAR ON FIRE.	P	Soil contamination	50
9500001694	28-Feb-95	THUNDER BAY CITY	2826 EAST ARTHUR ST	331344	5361081	L	TRANSFORMER OIL	5	L	THUNDER BAY HYDRO-5 L NON-PCB TRANSFORMER OIL TO CONCRETE, CLEANED UP	N		
9500006439	2-Mar-95	THUNDER BAY CITY				L	DIESEL FUEL	10	L	DAWSON RD TRUCK STOP:10 LDIESEL FUEL TO GROUND DURING FILLING.	N		99
9500001932	7-Mar-95	THUNDER BAY CITY	NEEBING AVENUE			LA	BLACK LIQUOR		UKN	AVENOR INC.-BLACK LIQUOR TO AIR AND LAND FROM MAIN STACK.	P	Multi Media Pollution	
9500001949	7-Mar-95	THUNDER BAY CITY	NEEBING AVENUE			L	SULPHURIC ACID	2250	L	AVENOR INC.- 2250 L SULPHURIC ACID TO GROUND :CONTAINED & NEUTRALIZED	P	Soil contamination	0
9500001956	8-Mar-95	THUNDER BAY CITY	NEEBING AVENUE			LW	COAL DUST		UKN	AVENOR-UKN QTY FINE COAL ASH TO GROUND & RIVER FROM COAL ASH SILO.	P	Multi Media Pollution	0
9500002031	10-Mar-95	THUNDER BAY CITY	LAKE SUPERIOR			W	HEAT EXCHANGER FLUID (N.O.S.)	10	L	SASKATCHEWAN WHEAT POOL - 10 LITRES OF OIL TO LAKE FROM HEAT EXCHANGER.	C	Water course or lake	0
9500002488	22-Mar-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	DIESEL FUEL	5	L	PETRO-CANADA- 5 L DIESEL TO CONCRETE PAVEMENT, OPERATOR ERROR,CLEANED UP	N		90
9500002781	30-Mar-95	THUNDER BAY CITY				L	DIESEL FUEL	500	L	AVENOR INC-500L DIESEL FUEL TO GRND.CONTAINED, PERMISSN TO BURN PENDING.	P	Soil contamination	
9500002945	5-Apr-95	THUNDER BAY CITY	PETRO CANADA CARD LOCK STATION AT 720 HEWITSON AVE.	333029	5363721	L	DIESEL FUEL	20	L	PETRO-CANADA - 20 L OF DIESEL FUEL TO PAVEMENT AT CARD LOCK STATION	N	Other	100
9500002949	5-Apr-95	THUNDER BAY CITY	IN ALLEY BEHIND 248 SOUTH WINDERMERE	333660	5367082	L	UNKNOWN	5	L	THUNDER BAY PUC - BLUE SUBSTANCE FROM SEPTIC SYSTEM DUMPED ON GROUND.	P	Soil contamination	0
9500003026	8-Apr-95	THUNDER BAY CITY	SHERBROOKE AND KENNSINGTON	331153	5362766	L	GASOLINE	2	L	PRIVATE/AUTO-2 L GASOLINETO ROADWAY,FLUSHED TO STORM SEWER BY FD.	P	Water course or lake	0
9500003181	13-Apr-95	THUNDER BAY CITY	1580 WEST ARTHUR ST., MNR MAINTENANCE YARD	327331	5361027	L	DIESEL FUEL	22	L	MNR - 22L DIESEL LEAK TO GRAVEL FROM STORAGE TANK CLEANED UP.	C	Soil contamination	99
9500003324	17-Apr-95	THUNDER BAY CITY	1100 MONTREAL ST.			L	PHENOL FORMALDEHYDE RESINS		UKN	NESTE RESINS- PHENOL-FOR-MALDEHYDE RUNOFF TO GR'NDDUE TO FIRE IN LUGGER BOX	P	Soil contamination	0
9500003339	18-Apr-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	GASOLINE	5	L	PETRO-CANADA- 5L GAS TO GROUND DURING MAINTENANCEWORK.	N		
9500003912	3-May-95	THUNDER BAY CITY	HWY 117 TO HARBOUR EXPWY TO BALMORAL STREET TO 470 BALMORAL STREET			L	DIESEL FUEL		UKN	TRANSPORT TRUCK: DIESEL SPRAYED ALONG ROAD FROM UNIDENTIFIED TRACTOR: OPP	N	Soil contamination	0
9500004023	5-May-95	THUNDER BAY CITY	NEEBING AVENUE			L	BLACK LIQUOR		UKN	AVENOR INC.- BLACK LIQUORTO GROUND FROM DIGESTER FLASH TANK.	N	Other	0
9500004072	7-May-95	THUNDER BAY CITY	NEEBING AVENUE			W	MILL EFFLUENT			AVENOR: SPILL OF FOAM EFFLUENT TO KAMINISTIQUIARIVER.	N		0
9500004467	16-May-95	THUNDER BAY CITY	PARKING LOT OF HANDY MART CORNER OF RIVER AND CUMBERLAND			L	MINERAL OIL (LT 50 PPM PCB)	56	L	THUNDER BAY HYDRO:56L NON-PCB MINERAL OIL TO PARKING LOT.	P	Soil contamination	0
9500004571	18-May-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	DIESEL FUEL	2	L	PETRO CANADA: 2L OF DIESEL TO CEMENT PAD. CLEANED UP WITH ABSORBANT	N		95
9500004587	18-May-95	THUNDER BAY CITY	BULK PLANT, 30 106TH STREET, MISSION ISLAND, THUNDER BAY	333993	5360182	L	GASOLINE	2	L	PETRO-CANADA BULK PLANT- 2L GAS TO CEMENT SURFACE.CLEANED BY OWNER.	N		
9500004605	18-May-95	THUNDER BAY CITY	KAM RIVER			W	BLACK LIQUOR		UKN	AVENOR INC.:SMALL QUANT. OF FOAM FROM OUTFALL TO KAM RIVER, DISSIPATED.	P	Water course or lake	0
9500004621	18-May-95	THUNDER BAY CITY	740 MEMORIAL AVENUE	333918	5364715	L	GASOLINE	15	L	BACKENTRY: IMPERIAL OIL: 15 L GASOLINE SPILLED TO PAVEMENT:OVERFILL:CLEANED	N	Other	90
9500004704	21-May-95	THUNDER BAY CITY	AT BANNON'S GAS BAR AT THE FOOT OF JAMES ST. ON CITY RD.			L	GASOLINE	5	L	GANNON'S GAS BAR - 5 L OF GASOLINE TO PAVEMENT.			100
9500005073	30-May-95	THUNDER BAY CITY	DAWSON STREET			L	HYDRAULIC OIL		UKN	TOWLAND-HEWITSON- HYDRAULIC OIL TO STREET FROM BROKEN VEHICLE LINE.	C	Soil contamination	90
9500005093	31-May-95	THUNDER BAY CITY	4161 GARDEN AVE.	326511	5361762	L	MINERAL OIL	60	L	THUNDER BAY HYDRO-45-60 L TRANSFORMER OIL TO LANDSOME TO WATERFILLED DITCH	C	Soil contamination	0
9500005257	3-Jun-95	THUNDER BAY CITY	MAPLEWARD & OLIVIA STREET INTERSECTION	324678	5365303	L	DIESEL FUEL	60	L	LAIDLAW ENV.: 60L DIESEL & C&D WASTE TO ROAD: FD OVERSEEING CLEANUP	N	Soil contamination	90
9500005789	15-Jun-95	THUNDER BAY CITY	AT THE GREYHOUND BUS TERMINAL ON MEMORIAL ST. IN THUNDER BAY			LW	DIESEL FUEL	90	L	GREYHOUND BUS CO. - 90 L OF DIESEL FUEL TO GROUND & SEWER, TANK OVERFLOW.	P	Soil contamination	100
9500006002	21-Jun-95	THUNDER BAY CITY	HWY 17 EAST AT HODDEN AVENUE	338767	5372333	L	DIESEL FUEL		UKN	BULK SYSTEMS-UKN QUANTITYDIESEL FUEL TO ROAD AND DITCH,CLEANUP UNDERWAY.	P	Soil contamination	0
9500006017	22-Jun-95	THUNDER BAY CITY	HARBOUR EXPRESSWAY			L	HYDRAULIC OIL	135	L	CITY OF THUNDER BAY: 135 L HYDRAULIC OIL TO ROAD FROM VEHICLE	N		0
9500006405	1-Jul-95	THUNDER BAY CITY	AT CN'S NEEBING YARD			L	DIESEL FUEL	450	L	C.N.RAIL-450 L OF DIESEL FUEL TO GROUND WHILE FUELING LOCOMOTIVE.	P	Soil contamination	0

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9500006612	4-Jul-95	THUNDER BAY CITY				A	CHLORINE GAS	5	KG	STERLING PULP CHEMICAL - 5 KG OF CHLORINE TO AIRFROM BLOWN FEAL POT.	C	Vegetation	0
9500006846	13-Jul-95	THUNDER BAY CITY	PETRO-CANADA TERMINAL 300 106TH ST. MISSION ISLAND	333993	5360182	L	DIESEL FUEL	10	L	PAUL'S HAULING 8-10 L OF DIESEL TO GROUND FROM VALVE FAILURE ON TRUCK.	N		90
9500006901	13-Jul-95	THUNDER BAY CITY	PORT ARTHUR TRANS STN #1, BEAR WTP ROAD OFF LAKESHORE DRIVE			L	TRANSFORMER OIL	113	L	POSNER INDUSTRIES-113L TRANSFORMER OIL TO GND, <50 PPM PCB'S.	P	Soil contamination	
9500006908	14-Jul-95	THUNDER BAY CITY	NEEBING AVENUE			LA	BLACK LIQUOR		UKN	AVENOR INC.-WEAK BLACK LIQUOR BLOWN OUT STACK SPRAYING 3 CARS IN LOT.	C	Other	0
9500007227	18-Jul-95	THUNDER BAY CITY	AT MTO'S SPRUCE RIVER RD. PATROL YARD			L	GASOLINE		UKN	MTO - UNKNOWN AMOUNT OF GASOLINE TO GROUND FROM FITTING AT PUMPS.	P	Soil contamination	0
9500007241	19-Jul-95	THUNDER BAY CITY	ON WHY 102 AT THE ESSO TRUCK STOP			L	PAINT OR PAINT RELATED N.O.S.		UKN	REIMER EXPRESS LINES -SMALL AMOUNT OF PAINT TOPAVEMENT FROM TRUCK.	N		100
9500007471	25-Jul-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	GASOLINE	50	L	PETRO-CANADA: 50 L OF GASOLINE TO LOADING RACK,CONTAINED AND CLEANED UP.	N		0
9500007523	26-Jul-95	THUNDER BAY CITY	KAM RIVER			W	BLACK LIQUOR		UKN	AVENOR INC-UNKNOWN QUANT.OF BLACK LIQUOR TO KAM RIVER, BOOMED.	P	Water course or lake	0
9500007617	28-Jul-95	THUNDER BAY CITY	251 WEST ARTHUR ST.	330913	5361178	L	GASOLINE		UKN	SHELL STATION:UNK AMT OF GASOLINE TO GROUND, U/G LINE FAILED PRESSURE TEST	P	Soil contamination	0
9500007644	29-Jul-95	THUNDER BAY CITY	LAKE SUPERIOR			W	BASOPLAST 265-D	16275	L	PROVINCIAL PAPERS: 16 275 L BASOPLAST 265-D TO PLANT EFFLUENT SYSTEM	P	Water course or lake	0
9500007820	1-Aug-95	THUNDER BAY CITY	300, 106 TH ST., MISSION ISLAND.	333993	5360182	L	GASOLINE	15	L	PETRO-CANADA-15 L GASOLI-NE TO CEMENT PAD AT TER- MINAL,PUMP FAIL. CLEANED.	N		90
9500009097	30-Aug-95	THUNDER BAY CITY	NEEBING AVENUE			W	MILL EFFLUENT			AVENOR:POWER FAILURE HAS RESULTED IN PROCESS WATERBYPASSED TO RIVER.	P	Water course or lake	0
9500009158	31-Aug-95	THUNDER BAY CITY	224 DOWNING ST.	333195	5369761	L	TRANSFORMER OIL	75	L	THUNDER BAY HYDRO- 75 L TRANSFORMER OIL TO GROUNDTRANSF. HIT BY LIGHTNING	C	Soil contamination	0
9500009259	3-Sep-95	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	WHITE WATER (PULP MILL WASTE)		UKN	AVENOR INC.- UNKNOWN AMOUNT OF WHITE WATER TO THE KAMINISTIQUIA RIVER.	P	Water course or lake	0
9500009262	3-Sep-95	THUNDER BAY CITY	161 MAIN STREET			L	RESIN SOLUTION	200	L	MANITOULIN TRANSPORT - 200 L OF STYRENE RESIN TO CEMENT FROM DRUM.	N	Other	100
9500009461	8-Sep-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	DIESEL FUEL	20	L	PETRO-CANADA:20 L DIESEL TO GROUND INSIDE DYKE, CONTAINED & CLEANED UP.	C	Soil contamination	0
9500009926	20-Sep-95	THUNDER BAY CITY	KIVIKOSKI ROAD (HOUSE AT 2ND DRIVEWAY ON RIGHT) FROM MAPLE STREET	325047	5376143	L	FURNACE OIL	126	L	IMPERIAL OIL OUTLET: 126 L FURNACE OIL TO WOODEN BASEMENT FLOOR	P	Soil contamination	40
9500010031	22-Sep-95	THUNDER BAY CITY				L	DIESEL FUEL	3	L	PETRO CANADA-3 L DIESEL TO CEMENT PAD,TANK TRUCK OVERFILLED,CLEANED-UP.	N		99
9500010072	24-Sep-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	DIESEL FUEL	5	L	PETRO-CANADA-5 L DIESEL TO CEMENT PAD & DRAIN TO INTERCEPTOR: CLEANED UP	N	Water course or lake	75
9500010192	27-Sep-95	THUNDER BAY CITY	ON HARDISTY RD BETWEEN OGDEN AND ROWAN.			L	MINERAL OIL	225	L	THUNDER BAY HYDRO:225L MINERAL OIL TO GROUND. T/F DAMAGED BY TRAIN.	P	Soil contamination	0
9500010255	28-Sep-95	THUNDER BAY CITY	701 NORAH CRESCENT	332992	5362808	L	LUBRICANT OIL(LUBE OIL)	1800	L	DIACHEM: 1800 L DEFOAMER (>80%CRANKCASE OIL) TO CN SPUR LINE RAIL TRACKS.	C	Soil contamination	0
9500010261	28-Sep-95	THUNDER BAY CITY	277 NORTH CUMBERLAND STREET	336716	5367917	L	GASOLINE	<1	L	SHELL CANADA-<1L GAS TO CONCRETE DUE TO OVERFILL:CLEANED, NO ENV. IMPACT	N		99
9500010432	3-Oct-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	DYE N.O.S.	90	L	PETRO-CANADA:90L DIESEL DYE TO CONTAINMENT AREA. CLEANED UP.	P	Soil contamination	0
9500010486	4-Oct-95	THUNDER BAY CITY	BRODY STREET BUS TERMINAL			LW	DIESEL FUEL	75	L	CITY OF THUNDER BAY:75L DIESEL TO GROUND AND SEWER. CLEAN-UP ONGOING.	P	Water course or lake	0
9500010533	5-Oct-95	THUNDER BAY CITY	30 OAKLAND AV			L	LUBRICATING OIL/GREASE	225	L	CP RAIL:225L 10W30 OIL TOGROUND THROUGH LEAKING VALVE ON TANK.	P	Soil contamination	0
9500010673	10-Oct-95	THUNDER BAY CITY	666 WEST ARTHUR STREET	329802	5361143	L	GASOLINE	3	L	HUSKY STATION:3L GASOLINETO ASPHALT. LEAKY GAS TANK. CLEANED UP.	N		95
9500010711	11-Oct-95	THUNDER BAY CITY	KAM RIVER			W	BLACK LIQUOR		UKN	AVENOR INC.:SMALL AMT OF BLACK LIQUOR FOAM TO KAM RIVER FROM COOLING TOWER.	P	Water course or lake	0
9500010939	17-Oct-95	THUNDER BAY CITY				L	GASOLINE	140	L	CENTRAL CANADA FUELS-140 L GASOLINE CEMENT PAD ANDSEPARATOR,DRIVER ERROR.	N		98
9500010980	18-Oct-95	THUNDER BAY CITY	MISSION ISLAND			L	GASOLINE		UKN	ONTARIO HYDRO-UKN QTY GASOLINE DISCOVERED IN EXCAVATION OF U/G TANK.	C	Soil contamination	0

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9500011147	23-Oct-95	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	DIESEL FUEL	4	L	PETRO-CANADA: 4 L OF GASOLINE TO LOADING RACK CONCRETE PAD: CLEANED UP.	N		100
9500011353	28-Oct-95	THUNDER BAY CITY				L	DIESEL FUEL	50	L	TOM MACDONALD FUELS-50 L DIESEL FUEL TO COMCRETE PAD,CONTAINED,CLEANED-UP.	N		99
9500011407	30-Oct-95	THUNDER BAY CITY	PETRO-CANADA DISTRIBUTION TERMINAL ON MISSION ISLAND			L	DIESEL FUEL	7	L	PETRO-CANADA-7L DIESEL TOCEMENT,O/W SEPARATOR.TANKOVERFILL. NO ENV IMPACT.	N		100
9500011905	12-Nov-95	THUNDER BAY CITY	NEEBING AVENUE			L	BLACK LIQUOR		UKN	AVENOR-UNK QTY BLACK LIQUOR TO GND. EQUIPMENT FAILURE. CLEANING.	C	Soil contamination	0
9500012422	27-Nov-95	THUNDER BAY CITY	MCVICAR'S CREEK			LW	HYDRAULIC OIL	9	L	BRUNO'S CONTRACTING-9 L HYDR FLUID FROM MV HOSE RUPTURE.CONS AUTH CLEANIN	P		0
9500012669	5-Dec-95	THUNDER BAY CITY	3OO 106TH STREET	333993	5360182	L	DIESEL FUEL	57	L	PETRO-CANADA: 57L DIESEL TO LOADING PAD DUE TO VALVE FAILURE. CLEANED	N		100
9500012744	6-Dec-95	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	COOLING WATER			AVENOR INC.: WATER FROM COOLING TOWER TO RIVER	P	Water course or lake	0
9500012754	7-Dec-95	THUNDER BAY CITY				L	DEFOAMING AGENT (N.O.S.)	450	L	DIACHEM-450 L DEFOAMER TOSNOW-COVERED PVMT. NO DRAINS.CLEANED.	N		100
9500012943	14-Dec-95	THUNDER BAY CITY				L	DIESEL FUEL	20	L	PETRO-CANADA BULK TERMNAL-10 L DIESEL TO CONCRETE CONTAINMENT. CLEANED UP.	N		99
9600000178	8-Jan-96	THUNDER BAY CITY	HWY 17/11 AND HWY 61 INTERSECTION			A	AMMONIA GAS (ANHYDROUS)		UKN	L.E.MATCHETTE-UNK QTY ANHAMMONIA TO ATM FRM TANK TRUCK.OPP.	C	Human health	0
9600000318	13-Jan-96	THUNDER BAY CITY	CPR TRACK,MILEAGE 70.5(SAVANNE SUBD) TO 131.7(THUNDER BAY AT JACKNIFE BRIDGE)			L	FUEL (N.O.S.)	3600	L	CPR-3825L FUEL TO 70K OF TRACK-2 PUNCTURED TANKS. CLEAN'G,MOST UNRECOVRABLE	C	Multi Media Pollution	4
9600000410	16-Jan-96	THUNDER BAY CITY	OFF HWY 17, W OF SAVANT RIVER, E OF UPLSALA, W SIDE OF HWY.			L	DIESEL FUEL	550	L	PODOLSKI TRUCKING: 550L QUANTITY OF DIES TO DITCH. ONGOING CLEANUP	P	Soil contamination	0
9600000477	17-Jan-96	THUNDER BAY CITY	HWY # 11 NORTHBOUND, JUST OUTSIDE OF THUNDER BAY.			L	DIESEL FUEL	100	L	DAVID JAGGARD TRUCKING- 100 L DIESEL TO HWY # 11,1 FATALITY, MVA, MTO, OPP	N		0
9600000920	27-Jan-96	THUNDER BAY CITY	3OO 106TH STREET	333993	5360182	L	DIESEL FUEL	50	L	PETRO-CANADA: 50L DIESEL TO LOADING PAD/TRANSPORT TRAILER: OVERFILL: MCCR	N		100
9600001010	30-Jan-96	THUNDER BAY CITY	HWY 61 B			L	LIME SLUDGE			AVENOR INC.- 1/2 TRUCK OFCAUSTIC MUD TO HWY.FROZENCLEANING, NO WATER.	N	Water course or lake	0
9600001162	4-Feb-96	THUNDER BAY CITY	CP RAIL YARD			L	DIESEL FUEL			CP RAIL: DIESEL FUEL TO GROUND	N		0
9600001226	6-Feb-96	THUNDER BAY CITY	THUNDER BAY LANDFILL SITE.			L	SEWAGE SLUDGE		UKN	THUNDER BAY LANDFILL SITE-UNK QUANT OF TREATEDSLUDGE TO MARSH AREA.	P	Other	0
9600001405	12-Feb-96	THUNDER BAY CITY				L	DIESEL FUEL	30	L	PETRO-CANADA TERMINAL-30LDIESEL TO CONCRETE.TANKEROVERFILL-ERROR.CLEANED.	N		100
9600001687	22-Feb-96	THUNDER BAY CITY	1879 NICHOLS ST.	329921	5371202	W	SEWAGE,RAW UNCHLORINATED		UKN	DAWSON RD. TRUCK STOP SEWAGE TO RESIDENT'S PROPERTY FROM SEPTIC.	C	Human health	0
9600001932	8-Mar-96	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	HIGH PH EFFLUENT (N.O.S.)			AVENOR: CAUSTIC LEAK FROM A VALVE CAUSED 15 MIN. PH EXCEEDENCE AT RIVER.	P	Water course or lake	0
9600001958	10-Mar-96	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	HIGH PH EFFLUENT (N.O.S.)		UKN	AVENOR-PH EXCEEDENCE TO 10.4,ALKALINE FLOOR CLEANER IN SEWER,	P	Water course or lake	0
9600002102	25-Mar-96	THUNDER BAY CITY	KAM RIVER			LW	PAPER MILL CLARIFIER EFFLUENT		UKN	AVENOR: PRIMARY TREATED KRAFT EFFLUENT TO KAM RIVER ICE: ONGOING	P	Water course or lake	0
9600002209	1-Apr-96	THUNDER BAY CITY	300 106TH ST.	333993	5360182	L	DIESEL FUEL	25	L	PETRO-CANADA: 25 L DIESELTO LOADING RACK, TRUCK OVERFILL, CLEANED UP.	N		88
9600002652	9-Apr-96	THUNDER BAY CITY	SILVER SPRINGS ESTATES TRAILER PARK, TRAILER #1, RR 16, BOX 62.			L	FURNACE OIL	90	L	PRIVATE RESIDENCE: 90 L FURNACE OIL TO GROUND FROM BROKEN VALVE ON TANK	P	Multi Media Pollution	0
9600002651	12-Apr-96	THUNDER BAY CITY	HWY 61 B			L	LANDFILL LEACHATE (N.O.S.)		UKN	AVENOR INC.: LANDFILL LEACHATE SPILLED TO PAVEDHIGHWAY OVER 1 KM.	N	Other	0
9600002684	13-Apr-96	THUNDER BAY CITY	LAKE SUPERIOR, THUNDER BAY HARBOUR POOL 7A			W	BUNKER FUEL OIL (NO. 4, 5 OR 6)		UKN	MARINE VESSEL "COMEAUDOC": BUNKER OIL LEAKING FROMRIVET PATCH,CCG,HARBOUR C	P	Water course or lake	90
9600003436	28-Apr-96	THUNDER BAY CITY				A	FLY ASH			ONT HYDRO THUNDER BAY TGS-HIGH OPACITY TO ATM- METER FAIL.LOAD REDUCED.	C	Air Pollution	0
9600003969	9-May-96	THUNDER BAY CITY				L	DIESEL FUEL	3	L	DAWSON RD TRUCK SPOT: 3L DIESEL TO ASPHALT. ABSORBENTS PUT DOWN.	N		89
9600004263	15-May-96	THUNDER BAY CITY	300 106TH ST.	333993	5360182	L	DIESEL FUEL	30	L	PETRO-CANADA BULK PLANT: 30 L OF DIESEL TO GROUND FROM SPLIT HOSE,CLEANED.	C	Soil contamination	99
9600004444	19-May-96	THUNDER BAY CITY	LAKE SUPERIOR			W	SLUDGE (N.O.S.)	400	L	PROVINCIAL PAPERS INC- 400 LITRES SLUDGE TO LAKE	N	Water course or lake	0
9600004622	23-May-96	THUNDER BAY CITY	AT THE NEEBING RAIL YARD			L	DIESEL FUEL	1300	L	C.N. RAIL - 1300 L OF DIESEL FUEL TO GROUND AT LOCOMOTIVE FUELING DEPOT.	P	Soil contamination	100

Table H-4
Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9600004647	24-May-96	THUNDER BAY CITY	NEEBING AVENUE			LA	WOOD		UKN	AVENOR INC.-WOOD FIBRE TOAIR AND RESIDENTIAL SITESFROM BROKEN SAFETY VALVE.	P	Multi Media Pollution	0
9600004735	26-May-96	THUNDER BAY CITY	DAWSON RD TRUCK STOP			L	DIESEL FUEL		UKN	STEN TRUCKING-UKN QTY DIESEL TO LOT,SOME TO DITCH,PARTIAL CLEAN-UP.	P	Multi Media Pollution	60
9600005174	4-Jun-96	THUNDER BAY CITY				L	DIESEL FUEL	18.2	L	CENTRA GAS-18.2 L DIESEL TO SOIL FROM COMPRESSOR. TO BE EXCAVATED.	C	Soil contamination	0
9600005590	13-Jun-96	THUNDER BAY CITY	5 MILES EAST OF THUNDER BAY ON HWY 11/17.			L	ASPHALT EMULSION		UKN	TANK TRUCK-OVERTURNED TANKER SPILLING ASPHALT WATER MIXTURE TO DITCH.	P	Soil contamination	0
9600006177	25-Jun-96	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	PAPER MILL STOCK		UKN	AVENOR-UNK QTY PAPER MILLSTOCK TO RIVER.PROCESS SEWER OVERFLOW.UNPLUGGED.	C	Soil contamination	0
9600006290	28-Jun-96	THUNDER BAY CITY	MAY STREET AT FINLAYSON STREET	333775	5362305	L	HYDRAULIC OIL			BFI: HYDRAULIC OIL TO ROAD	N		0
9600006501	4-Jul-96	THUNDER BAY CITY	AT ONTARIO HYDRO'S THUNDER BAY TERMINALS ON MCKELLER ISLAND			LW	HYDRAULIC OIL	10	L	ONTARIO HYDRO - 10 L OF HYDRAULIC OIL TO GROUND FROM TRUCK.	C	Multi Media Pollution	0
9600006979	15-Jul-96	THUNDER BAY CITY	AT CARD LOCK STATION AT 645 MOUNTDALE RD.	330006	5360686	L	DIESEL FUEL	30	L	IMPERIAL OIL STATION - 30 L OF DIESEL FUEL TO GROUND FROM HOSE.	P	Soil contamination	100
9600007410	25-Jul-96	THUNDER BAY CITY	62 WALKOVER ROAD	333630	5368283	L	TRANSFORMER OIL	137	L	TB HYDRO: 137 L NON-PCB TRANSFORMER OIL TO PAD & SOIL; CLEANED UP.	C	Soil contamination	95
9600007650	1-Aug-96	THUNDER BAY CITY	1110 WEST ARTHUR STREET, SHELL S.S.	329198	5361161	L	USED MOTOR OIL	2	L	SOURCE UNKNOWN: 2 L OF MOTOR OIL TO PAVED LOT ATSHELL S.S.,CLEANED UP.	N		99
9600008104	12-Aug-96	THUNDER BAY CITY	CP RAIL YARD			L	DIESEL FUEL	90	L	CP RAIL - 90 L OF DIESEL FUEL TO GROUND FROM LOCOMOTIVE.	P	Soil contamination	0
9600008302	16-Aug-96	THUNDER BAY CITY	ON BROADWAY AVE. & HWY 61 & 61B			L	LIME SLUDGE		UKN	AVENOR - UNKNOWN AMOUNT OF LIME MUD TO GROUND FROM TRUCK.	P	Soil contamination	0
9600009068	19-Aug-96	THUNDER BAY CITY	BOULEVARD LAKE RECREATION CENTRE.	333537	5361341	LW	SEWAGE,RAW UNCHLORINATED		UKN	THUNDER BAY WORKS:SEWAGE OVERFLOW DUE TO PLUGGED MAIN.	P	Soil contamination	70
9600008582	23-Aug-96	THUNDER BAY CITY				L	DIESEL FUEL	24	L	TRANSPORT ACCIDENT SPILL OF DIESEL AND OIL TO DITCH-CLEANED UP	P	Vegetation	75
9600008950	2-Sep-96	THUNDER BAY CITY	NEEBING AVENUE			A	BLACK LIQUOR		UKN	AVENOR:BLACK LIQUOR FROM RECOVERY BOILER,UP STACK COVERING EMPLOYEE'S CARS.	P	Air Pollution	70
9600009021	3-Sep-96	THUNDER BAY CITY	300 106TH ST.	333993	5360182	L	DIESEL FUEL	70	L	PETRO-CANADA: 70L DIESEL TO LOADING RACK, TRUCK OVERFILL, CLEANED UP.	N		90
9600009214	7-Sep-96	THUNDER BAY CITY	FORT WILLIAM RESERVE			L	SEWAGE,RAW UNCHLORINATED		UKN	FORT WILLIAM RESERVE- SEPTIC WASTES TO GROUND.	P	Water course or lake	0
9600009243	8-Sep-96	THUNDER BAY CITY	CORNER DAWSON ROAD AND DOG LAKE ROAD IN MACINTRYRE RIVER.			W	GASOLINE		UKN	PRIVATE OWNER-AUTO TO RIVER, OPERATING FLUIDS TO RIVER.	P	Water course or lake	0
9600009319	10-Sep-96	THUNDER BAY CITY				W	SEAL OIL (TURBINE LUBE OIL)	90	L	ONTARIO HYDRO:90L LUBE OIL SPILLED TO LAKE SUPERIOR.	P	Water course or lake	0
9600009641	16-Sep-96	THUNDER BAY CITY	868 COPPER CRESCENT	332991	5364913	L	TRANSFORMER OIL		UKN	THUNDER BAY HYDRO-SMALL LEAK OF TRANSFORMER OIL TO GROUND.	P	Soil contamination	50
9600009762	19-Sep-96	THUNDER BAY CITY	863 POLELINE RD.			LA	TRANSFORMER OIL	9	L	ONTARIO HYDRO: 9 L TRANS-FORMER OIL TO POLE,BURNEDDURING FIRE,NO CLEANUP.	P	Air Pollution	0
9600010046	26-Sep-96	THUNDER BAY CITY	NEEBING AVENUE			LW	SEWAGE,RAW UNCHLORINATED			AVENOR-20 MIN SEWAGE OVER-FLOW TO STREET & RIVER.	P	Water course or lake	0
9600010447	7-Oct-96	THUNDER BAY CITY	KAM RIVER			LW	PULP STOCK		UKN	AVENOR INC: LARGE QTY OF GROUND NEWSPRINT SLURRY TO BUILDING & KAM RIVER	P	Water course or lake	0
9600010544	9-Oct-96	THUNDER BAY CITY	PETRO-CANADA DISTRIBUTION TERMINAL ON MISSION ISLAND			L	GASOLINE	100	L	HARMAC- 100L GASOLINE TO CEMENT,O/W SEPARATOR.TANKOVERFILL. NO ENV IMPACT	N		100
9600010900	19-Oct-96	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	DIESEL FUEL	20	L	PETRO-CANADA-20 L DIESEL TO CONCRETE PAD AT TERMI-NAL, CLEANED UP.	N		90
9600010907	19-Oct-96	THUNDER BAY CITY				L	GASOLINE	40	L	TRIMAC TRANSPORT-40 L GA-SOLINE TO TERMINAL GROUNDVALVE FAILURE, CLEANED-UP	N		98
9600011000	22-Oct-96	THUNDER BAY CITY	THUNDER BAY HARBOUR, SLIP 7A			W	USED MOTOR OIL	180	L	UNKNOWN SOURCE:180L USED MOTOR OIL IN HARBOUR, CONTAINED.	P	Water course or lake	100
9600011063	23-Oct-96	THUNDER BAY CITY	EXPRESSWAY (HWY 11-17) AT BALSAM			LW	DIESEL FUEL	136	L	TRANSPORT TRUCK-136 L DIESEL TO DRAINAGE DITCH,MVA,OPP,MTO ENROUTE.	P	Multi Media Pollution	0
9600011350	31-Oct-96	THUNDER BAY CITY	CENTENNIAL PARK CHALET			L	MINERAL OIL (LT 50 PPM PCB)	90	L	THUNDER BAY HYDRO: 90 L MINERAL OIL TO GROUND, CONTAINED AND CLEANED UP.	C	Soil contamination	99
9600011388	1-Nov-96	THUNDER BAY CITY	AT THE NEEBING RAIL YARD			L	DIESEL FUEL		UKN	C.N. RAIL: UNKNOWN AMOUNTDIESEL FUEL TO GROUND AT LOCOMOTIVE FUELING DEPOT.	P	Soil contamination	90
9600011496	4-Nov-96	THUNDER BAY CITY	LAKE SUPERIOR			W	SUSPENDED SOLIDS [N.O.S.]		UKN	ONTARIO HYDRO TGS - HIGH SUSPENDED SOLIDS IN EFFLUENT, BLOCKED SCREENS	P	Water course or lake	0
9600011497	4-Nov-96	THUNDER BAY CITY	300 106TH ST.	333993	5360182	L	DIESEL FUEL	3	L	PETRO-CANADA: 3L DIESEL TO LOADING RACK, TRUCK OVERFILL, CLEANED UP.	N		90

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9600011553	5-Nov-96	THUNDER BAY CITY	300 106TH ST.	333993	5360182	L	GASOLINE ADDITIVE (N.O.S.)	6	L	PETRO-CANADA:6L ADDITIVE TO LOADING RACK PAD: VALVE ERROR, CLEANED UP.	N		99
9600011582	5-Nov-96	THUNDER BAY CITY	NEEBING AVENUE			W	UNKNOWN			AVENOR:PH FROM OUTFALL FROM STORM SEWER DROPPED TO 2.9. CAUSE UNKNOWN.	P	Water course or lake	0
9600011632	7-Nov-96	THUNDER BAY CITY	645 MOUNTDALE AVENUE	330006	5360686	L	DIESEL FUEL	70	L	RUUSKA TRUCKING-70 LITERSDIESEL TO CEMENT PAD, CONTAINED,CLEANED-UP.	N		99
9700000443	13-Jan-97	THUNDER BAY CITY	CN RAIL YARD.			L	DIESEL FUEL	2.27	M3	C.N. RAIL-2.27 M3 DIESEL TO GROUND AT RE-FUELING STATION,CLEANED-UP.	N		0
9700000898	29-Jan-97	THUNDER BAY CITY	THUNDER BAY AIRPORT			L	AVIATION FUEL (JET A OR B, TURBO)	500	L	MAINTAIR AVIATION: 500 L JET FUEL TO GR'ND AT AIR-PORT,TK OVERFILL,CLEANING	P	Soil contamination	0
9700001184	7-Feb-97	THUNDER BAY CITY	TO KAMINISTIQUIA RIVER			W	CHLORINE DIOXIDE			AVENOR INC: PH 5 FOR 10 MINUTES AT KRAFT CLEANWATER OUTFALL	P	Water course or lake	0
9700001380	13-Feb-97	THUNDER BAY CITY	300 106TH ST.	333993	5360182	L	DIESEL FUEL	20	L	PETRO-CANADA: 20L DIESEL TO LOADING RACK DUE TO OVERFILL, CLEANED UP .	N		99
9700001855	25-Feb-97	THUNDER BAY CITY	600 HARBOUR EXPRESSWAY.			L	FURNACE OIL	20	L	TRIMAC- 20L OF GASOLINE TO ASPHALT.. CLEANED.	N		95
9700002089	2-Mar-97	THUNDER BAY CITY	CORNER OF NICKEL ST. & HUNTER RD.	330078	5371118	L	DIESEL FUEL		UKN	DAWSON RD TRUCK STOP- DIESEL FUEL RUNNING OFF PROPERTY DOWN STREET.	P	Soil contamination	0
9700002098	3-Mar-97	THUNDER BAY CITY	300 106TH ST.	333993	5360182	L	DIESEL FUEL	84	L	PETRO-CANADA: 84 L DIESELTO LOADING RACK PAD,SPOUTFELL OUT OF TANK,CLEANED.	N		99
9700002180	5-Mar-97	THUNDER BAY CITY	NEEBING AVE.			A	CHLORINE GAS		UKN	AVENOR INC.-UNK QUANT OF CHLORINE GAS TO ATM DUE TO PROCESS UPSET AT MILL.	C	Air Pollution	0
9700003193	26-Mar-97	THUNDER BAY CITY				L	WHITE LIQUOR		UKN	AVENOR INC. - UNKNOWN AMOUNT OF WHITE LIQUOR TO GROUND.	P	Soil contamination	0
9700003224	3-Apr-97	THUNDER BAY CITY	LAKEHEAD UNIVERSITY	332578	5365488	LW	DIESEL FUEL	55	L	CITY OF THUNDER BAY: 55L OF DIESEL FULE TO ROAD AND CATCH BASIN	N	Water course or lake	70
9700003282	4-Apr-97	THUNDER BAY CITY	937 ALLOY DR.	333419	5364260	L	WASTE OIL	1300	L	BULK SYSTEMS-1300 L OF WASTE OIL TO THE GROUND FROM STORAGE TANK	P	Multi Media Pollution	0
9700003336	6-Apr-97	THUNDER BAY CITY	570 FORT WILLIAM			LW	DIESEL FUEL	40	L	THUNDER BAY TRANSIT: 40 L DIESEL TO HOLDING TANK,WORKS TO CLEAN UP.	N	Other	99
9700003868	18-Apr-97	THUNDER BAY CITY	C.P. TERMINAL, 949 FORT WILLIAM ROAD			L	BLEACH SOLUTION	20	L	CANADIAN TIRE: 20 L JAVEXAND 16 L FEEDEX SPILLED INSIDE TRAILER & GROUND.	N	Other	99
9700003923	19-Apr-97	THUNDER BAY CITY	LAKE SUPERIOR, NORTH HARBOUR INSIDE THE PIERS			W	OIL (PETROLEUM BASED, NOT SPECIFIED)		UKN	UNKNOWN SOURCE-OIL SHEEN 500M LENGTH IN NORTH HARBOUR OF THUNDER BAY.	P	Water course or lake	0
9700004107	23-Apr-97	THUNDER BAY CITY				L	WHITE LIQUOR			AVENOR - UNKNOWN AMOUNT OF WHITE LIQUOR TO LAND FROM STORAGE TANK.	C	Soil contamination	0
9700004196	26-Apr-97	THUNDER BAY CITY	538 RED RIVER ROAD	334668	5367505	L	FURNACE OIL	350	L	PRIVATE RESIDENCE:UP TO 400L FURNACE OIL TO GROUND,CONTAINED,ERP C/O.	P	Soil contamination	0
9700004577	5-May-97	THUNDER BAY CITY	LAKE SUPERIOR VIA CURRENT RIVER			L	PETROLEUM OIL (N.O.S.)		UKN	UNK SOURCE-LIGHT OIL SHEEN NOTED IN CURRENT R.COMING FROM SHORE	C	Water course or lake	0
9700004852	12-May-97	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	6	L	MAINTAIR AVIATION:6 L JETFUEL TO GR'ND AT AIRPORT FROM AIRCRAFT VENT,CLEAND	N	Soil contamination	99
9700004999	13-May-97	THUNDER BAY CITY				L	HYDRAULIC OIL		UKN	GREAT WEST TIMBER LTD- HYDRAULIC OIL SPILLED TO GROUND, CLEANED.	P	Soil contamination	90
9700005894	7-Jun-97	THUNDER BAY CITY	ESSO DAWSON TRUCK STOP ON HWY # 102. 1869 DAWSON RD.	329965	5371205	L	DIESEL FUEL	750	L	N YANKE TRANSPORT-750 L DIESEL LEAK AT ESSO TRUCKSTOP & HWY # 102, CLEANED	C	Soil contamination	95
9700006047	7-Jun-97	THUNDER BAY CITY				W	STARCH	2080	KG	PROVINCIAL PAPERS INC.- 2080 KG STARTCH TO LAGOON(BACKENTRY).	P	Water course or lake	0
9700006046	10-Jun-97	THUNDER BAY CITY	965 STRATHCONA AVE	339997	5370827	L	DEFOAMING AGENT (N.O.S.)	1000	L	BACKENTRY-THUNDER BAY PACKAGING-1000 L DEFOAMERTO SEWERS.	P		0
9700006150	13-Jun-97	THUNDER BAY CITY	9 SOUTH HWY ST.			L	HYDRAULIC OIL	3	L	THUNDER BAY HYDRO-3 L HY-DRAULIC OIL TO RD FROM TRUCK HOSE, CLEANED UP.	N		99
9700006661	23-Jun-97	THUNDER BAY CITY	LAKE SUPERIOR (THUNDER BAY HARBOUR-BETW UNITED GRAIN GROWERS & PASCAL)			W	PETROLEUM OIL (N.O.S.)		UKN	UNK SOURCE-UNK VOL OF LIGHT OIL IN HARBOUR.	P	Surface Water Pollution	0
9700006968	30-Jun-97	THUNDER BAY CITY	611 MCLAUGHLIN ST.	334753	5362297	L	TRANSFORMER OIL	20	L	TB HYDRO: 20 L NON-PCB TRANSFORMER OIL TO GRASS & SOIL; WILL CLEANUP.	C	Soil contamination	0
9700007558	11-Jul-97	THUNDER BAY CITY				A	FREON R-11 (CFC)	600	KG	ST. JOSEPH'S HOSPITAL- 600 KG FREON R-11 TO AIR,EVAPORATOR RUPTURE.	P	Air Pollution	0
9700007589	12-Jul-97	THUNDER BAY CITY	1535 CITY ROAD			L	SODIUM CHLORATE (SOLUTION)	100	L	STERLING PULP CHEMICALS 50-100 L SODIUM CHLORATE SOLUTION TO GROUND.	C	Soil contamination	90
9700007756	16-Jul-97	THUNDER BAY CITY				L	CHROME SOLUTION	400	L	STERLING PULP CHEMICALS: 400 L WASTE WATER WITH CHROMIUM TO DITCH	N		0
9700007953	18-Jul-97	THUNDER BAY CITY	251 WEST ARTHER ST.	330913	5361178	L	GASOLINE	90	L	SHELL-<90L OF GASOLINE FOUND IN CONTAINMENT BOX.CLEANING & REPAIRING.	P	Soil contamination	99
9700008501	29-Jul-97	THUNDER BAY CITY	1101 ARTHUR STREET			L	DIESEL FUEL	67	L	BEATRICE FOODS: 67 L DIESEL FUEL TO LAND	N		100

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9700009174	13-Aug-97	THUNDER BAY CITY	1110 WEST ARTHUR ST.	329198	5361161	L	ETHYLENE GLYCOL (ANTIFREEZE)	3	L	SHELL CANDA-3L ANTIFREEZETO GROUND, CLEANED UP, NO CATCHBASINS.	N		90
9700009295	15-Aug-97	THUNDER BAY CITY	INTERSECTION OF MAIN STREET AND FORT WILLIAM RD.	334168	5363911	L	DIESEL FUEL	200	L	MANITOULIN TRANSPORT: 200L DIESEL TO ROAD AND GRAVEL PARKING LOT.	P	Soil contamination	60
9700010719	21-Aug-97	THUNDER BAY CITY				W	OIL (PETROLEUM BASED, NOT SPECIFIED)	80	L	BACKENTRY:ABITIBI- 80L OIL TO LAKE.	P	Water course or lake	90
9700009821	27-Aug-97	THUNDER BAY CITY	HABOUR EXPRESSWAY & MEMORIAL AVE.	333821	5363942	LW	DIESEL FUEL	450	L	BULK SYSTEMS-450 L DIESELTO ROADWAY & STORM SEWER,FD,PD AND WORKS.	P	Multi Media Pollution	0
9700010137	29-Aug-97	THUNDER BAY CITY	MOUNTAIN ROAD AT HWY 61B	329395	5357318	L	ASH AND WATER	50	L	AVENOR INC.-BACKENTRY 50 L ASH/WATER TO ROAD, CLEANED UP.	N	Soil contamination	90
9700010078	2-Sep-97	THUNDER BAY CITY				L	DIESEL FUEL	9	L	NORTHER WOOD PRESERVERS: 9 L DIESEL TO SOIL AT SEDIMENT REMEDIATION	P	Soil contamination	0
9700010144	4-Sep-97	THUNDER BAY CITY	HWY 117 AT HWY 102.			L	DIESEL FUEL	10	L	UNK TRANSPORT-<10L OF DIESEL OR HYDRAULIC OIL TO ROADWAY. FD CLEANED.	N		90
9700010226	5-Sep-97	THUNDER BAY CITY	1110 WEST ARTHUR STREET	329198	5361161	L	ETHYLENE GLYCOL (ANTIFREEZE)	3	L	PRIVATE AUTO-3 LITERS ANTIFREEZE TO LOT, CONTAINED AND CLEANED-UP.	N		99
9700010474	11-Sep-97	THUNDER BAY CITY				A	SALT CAKE		UKN	AVENOR: SALT CAKE PARTICULATE TO ATM :A-BOILER PRECIP FAILURE	P	Air Pollution	0
9700010476	11-Sep-97	THUNDER BAY CITY	84 SOUTH ALGOMA STREET	335252	5366966	L	GASOLINE	135	L	FRANK'S SERVICE STATION: 135 L GASOLINE TO GROUND :CONTAINED: FD CLEANING	N	Soil contamination	99
9700010857	19-Sep-97	THUNDER BAY CITY	RED RIVER RD. & CLARKSON AVE.	333807	5368111	L	GASOLINE	10	L	PAULS HAULAGE- 10L GASOLINE TO CONCRETE. CONTAINED/CLEANED	N		90
9700010996	23-Sep-97	THUNDER BAY CITY	901 ATLANTIC AVENUE	335116	5362658	L	FERRIC CHLORIDE (SOLUTION)	682	L	THUNDER BAY PUC-682 L FERRIC CHLORIDE TO GRND, CLEAN-UP UNDERWAY.	N		0
9700011267	28-Sep-97	THUNDER BAY CITY	CREEK AT SPRUCE RIVER RD, SOUTH OF HWY 1117			LW	GASOLINE	5	L	PRIVATE OWNER:UP TO 10 GASOLINE AND OIL SPILLED TO CREEK.	P	Water course or lake	0
9700011558	5-Oct-97	THUNDER BAY CITY	1120 ALLOY DRIVE, HUSKY HOUSE GAS BAR.			L	DIESEL FUEL	100	L	HUSKY CARDLOCK STATION- 80 TO 100 L DIESEL FUEL TO GROUND,CONTAINED.	P	Soil contamination	90
9700012001	15-Oct-97	THUNDER BAY CITY	LAKE SUPERIOR, THUNDER BAY HARBOUR BETW. BUOY #P2 & MISSION RIVER.			W	PETROLEUM OIL (N.O.S.)		UKN	UNK SOURCE-UNK VOL OF UNK OIL IN THUNDERBAY HARBOUR	C	Water course or lake	0
9700012845	15-Oct-97	THUNDER BAY CITY	4TH LINE AT VICKERS ST. & NEEBING RIVER.			W	GASOLINE		UKN	BACKENTRY-PRIVATE VEHICLE-UNK VOL OF GASOLINE TO RIVER. NOT RECOVERED.	C	Water course or lake	0
9700012289	21-Oct-97	THUNDER BAY CITY	EXPRESSWAY/OLIVER RD.			L	DIESEL FUEL	2	L	GMAX TRANSPORT- MVA, 4 L DIESEL & ANTIFREEZE TO HWY, WORKS & MOE ON SITE.	N		0
9700012506	22-Oct-97	THUNDER BAY CITY	HWY 11/17 AND JOHN STREET			L	DIESEL FUEL	800	L	BACKENTRY: HYNDMEN TRANS:800L DIESEL TO ROAD AND DITCH.	P	Soil contamination	50
9700012814	2-Nov-97	THUNDER BAY CITY	408 WEST FREDERICA			L	GASOLINE	5	L	BEAVER GAS BAR- 5L GAS TO GROUND, HOSE RIPPED OFF PUMP.	N		90
9700013142	10-Nov-97	THUNDER BAY CITY	ARTHUR STREET			L	HYDRAULIC OIL			RECOOL: HYDRAULIC OIL TO PARKING LOT AND ROAD	P	Other	0
9700013328	14-Nov-97	THUNDER BAY CITY	WELDLAND STEEL LTD, TERMINAL 6 WHARF DEVELOPMENT-MARINA PARK.			L	HYDRAULIC OIL	20	L	WELDLAND STEEL- 20 L OF HYDRAULIC FLUID TO LAND, CLEANING UP.	P	Soil contamination	90
9700013724	27-Nov-97	THUNDER BAY CITY	CP RAILYARD IN THE AREA OF HARDISTY AND VICTORIA			A	BUTANE		UKN	CANADIAN PACIFIC RAILWAYSBUTANE LEAK TO AIR FROM DERAILED TANKER,EVAC'N.	P	Air Pollution	0
9700013927	3-Dec-97	THUNDER BAY CITY	HWY 61 NEAR CN OVERPASS BETWEEN THUNDER BAY AIRPORT AND AVENOR PULP MILL.			L	DIESEL FUEL	100	L	LANDSTAR LIGON -RUPTURED SADDLE TANK, DIESEL & ANTIFREEZE TO ROAD/DITCH.	P	Soil contamination	90
9700014010	5-Dec-97	THUNDER BAY CITY				L	DIESEL FUEL	5	L	PETRO CANADA:5L DIESEL SPILLED TO OIL-WATER SEPARATOR.	N		98
9700014048	6-Dec-97	THUNDER BAY CITY	HWY 11-17 AT HODDER AVENUE.			L	DIESEL FUEL	90	L	KILBAR TRANSPORT-90 L DIESEL TO ROADWAY & DRY DITCH,FD,MTO,OPP.	P	Soil contamination	0
9700014172	9-Dec-97	THUNDER BAY CITY				L	WHITE LIQUOR		UKN	AVENOR INC.-UNK VOL OF WHITE LIQUOR TO GROUND. TO BE CLEANED.	P	Soil contamination	0
9700014441	16-Dec-97	THUNDER BAY CITY	1100 MONTREAL STT.			L	SALT CAKE		UKN	AVENOR INC. - SALT CAKE PARTICULATE FALLOUT FOR 1 HR.	N	Other	0
9700014493	17-Dec-97	THUNDER BAY CITY				L	DIESEL FUEL	75	L	PETRO-CANADA-75 L DIESEL TO CEMENT APRON, CLEANED.	N		90
9800000492	14-Jan-98	THUNDER BAY CITY				L	WHITE LIQUOR	450	L	AVENOR INC: 450 L TREATEDWHITE LIQUOR TO GRAVEL, HOLE IN TANK SUCTION LINE	C	Soil contamination	0
9800001118	4-Feb-98	THUNDER BAY CITY	300 106TH STREET	333993	5360182	L	GASOLINE	10	L	PETRO-CANADA: 10 L GASOLINE TO CEMENT PAD	N		100
9800001399	13-Feb-98	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	5	L	MAINTAIR AVIATION:5 L JETFUEL TO GR'ND AT AIRPORT FROM SWIVEL SEAL,CLEANED.	N	Other	99
9800001426	14-Feb-98	THUNDER BAY CITY	1100 MONTREAL ST.			L	RESIN/WATER SOLUTION	3000	KG	NESTE RESINS -3000 KG OF RESIN (52% WATER) TO ASPHALT, CONTAINED.	N	Other	0

Table H-4
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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9800001754	24-Feb-98	THUNDER BAY CITY	AT THE DAWSON ROAD TRUCK STOP AT THE CORNER OF NICKEL ST. & HUNTER RD.	329965	5371205	L	NAPTHALENE	150	L	TRANSPORT TRUCK - 150 L OF NAPTHA TO PAVEMENT FROM LEAKY DRUM.	N	Other	0
9800001886	28-Feb-98	THUNDER BAY CITY	AT THE SHELL CANADA CARD-LOCK STATION, 760 WEST ARTHUR STREET	330058	5360683	LW	DIESEL FUEL	100	L	P & D TRUCKING: 100 L OF DIESEL TO FILL ISLAND & OIL/WATER SEPARATOR.	N	Other	99
9800002060	6-Mar-98	THUNDER BAY CITY	ROADWAY FROM 645 MOUNTDALE AVE TO BUCHANAN B.N.A.			L	DIESEL FUEL		UKN	DELMAR TRUCKING-UNK QUAN DIESEL TO ROADWAY, LEAK STOPPED.	P	Soil contamination	10
9800002160	9-Mar-98	THUNDER BAY CITY	1450 WALSH ST AT JOHN DEERE WOODLAND TRACTORS SITE.			L	HYDRAULIC OIL	100	L	IMPERIAL OIL TRANSPORT TRUCK-100 L HYDRAULIC OILTOPAVEMENT, CLEANED UP.	P	Soil contamination	99
9800002624	23-Mar-98	THUNDER BAY CITY				L	LIME SLUDGE	1	M3	BACKENTRY: 1M3 LIME MUD TO ROAD.	N		0
9800003070	2-Apr-98	THUNDER BAY CITY	1869 DAWSON ROAD	329965	5371205	L	DIESEL FUEL	10	L	REBER INC.: 10 L DIESEL FUEL TO GROUND	N		99
9800003355	9-Apr-98	THUNDER BAY CITY	HWY 11-17, PASS LAKE			L	DIESEL FUEL		UKN	TRANSPORT ACCIDENT SPILL OF DIESEL TO 25 MILES OF HIGHWAY.	P	Soil contamination	0
9800003550	14-Apr-98	THUNDER BAY CITY	FORD AND RIVERVIEW			L	HYDRAULIC OIL	1	L	ONTARIO HYDRO- 1L HYDRAULIC OIL TO GROUND CLEANED.	P	Soil contamination	90
9800004191	2-May-98	THUNDER BAY CITY	888 RED RIVER ROAD, SHELL SERVICE STN.	333712	5368479	L	GASOLINE	6	L	SHELL CANADA- 6 LITRES GASOLINE TO GROUND FROM LEAKING GAS TANK.	N		90
9800004822	20-May-98	THUNDER BAY CITY	IN PARKING AREA OF KOUNTRY KORNER, HWY 590 AND HWY 588			L	GASOLINE	40	L	ROBIN OLIVER: 60L GASOLINE SPILLED TO GRAVEL AND SOD.	P	Soil contamination	10
9800006142	25-Jun-98	THUNDER BAY CITY	KAMINISTIKWA RIVER			W	WASTEWATER WITH PULP FIBRE		UKN	AVENOR INC. -20 MINUTE PRIMARY EFFLUENT BYPASS DUE TO POWER OUTAGE.	P	Water course or lake	0
9800006164	25-Jun-98	THUNDER BAY CITY	807 RIVER RD.			L	GASOLINE	4	L	PRIVATE CAR-4 L GASOLINE LEAK AT BEAVER GAS STN, HOLE IN CAR TK,WILL CLEAN	N		80
9800006172	26-Jun-98	THUNDER BAY CITY	KAMINISTIKIA RIVER			W	MILL EFFLUENT	1000	M3	AVENOR: 1000M3 UNTREATED MILL EFFLUENT TO RIVER DUE TO POWER FAILURE.	P	Water course or lake	0
9800006323	29-Jun-98	THUNDER BAY CITY				L	SULPHURIC ACID		UKN	AVENOR INC.-UNK QUANT OF SULPHURIC ACID ONTO GRND FROM RAILCAR, WILL CLEAN.	C	Soil contamination	0
9800006469	2-Jul-98	THUNDER BAY CITY	476 HAZELWOOD DR	31748	5372102	L	TRANSFORMER OIL	55	L	BACKENTRY: THUNDER BAY HYDRO-55L NONPCB X-FORMEROIL TO GROUND.CLEANED UP.	N	Soil contamination	100
9800006747	11-Jul-98	THUNDER BAY CITY	IN PARKING LOT AT LIMBERICK PLACE			LW	GASOLINE	135	L	TRUCK (N.O.S) -135 L OF GASOLINE TO PAVEMENT, SMALL AMT. OF STORM SEWER	N		90
9800006931	16-Jul-98	THUNDER BAY CITY				L	SODIUM HYDROXIDE (SOL'N) (CAUSTIC SODA)	60	L	AVENOR - 60 L OF CAUSTIC SODA TO GROUND, TANK OVERFLOW, CONTAINED.	P	Soil contamination	0
9800007005	17-Jul-98	THUNDER BAY CITY	KENTUCKY FRIED CHICKEN AT ARTHUR AND EDWARD.			L	COOKING GREASE		UKN	KENTUCKY FRIED CHICKEN- GREASE OVERFLOW TO GROUNDAND C/B. CONTAINED.	N	Water course or lake	90
9800007363	29-Jul-98	THUNDER BAY CITY	ON HWY 61 NEAR NEAR THE KAMINISTIQUIA RIVER			L	DIESEL FUEL	675	L	TRUCK (N.O.S) -675 L OF DIESEL TO HWY. & DITCH FROM SADDLE TANKS.	C	Soil contamination	75
9800007521	2-Aug-98	THUNDER BAY CITY	PETRO-CANADA DISTRIBUTION TERMINAL ON MISSION ISLAND			L	FURNACE OIL	40	L	PETRO-CANADA TERMINAL - 40 L OF FURNACE OIL TO GRAVEL.	P	Soil contamination	100
9800008084	20-Aug-98	THUNDER BAY CITY	FLORRIE ROAD \@25KM S OF HWY#11			L	PESTICIDE N.O.S.	100	L	SUPERIOR HELICOPTER- 100 L DILUTE PESTICIDE TO GRAVEL RD DUE TO LEAK.	P	Soil contamination	60
9800008461	31-Aug-98	THUNDER BAY CITY	MISSION ISLAND BULK TERMINAL			W	OIL (PETROLEUM BASED, NOT SPECIFIED)	1	L	MISSION RIVER - SHEEN FROM OILY WATER DISCHRGE FROM MARINE VESSEL.	P	Water course or lake	0
9800008560	2-Sep-98	THUNDER BAY CITY	CAM RIVER			W	PULP MILL EFFLUENT	2295	M3	BOWATER-2295 M3 UNTREATEDMILL EFFLUENT TO RIVER, LEVEL INDICATOR FAILURE.	P	Water course or lake	0
9800009085	18-Sep-98	THUNDER BAY CITY	374 OTTO STREET, RESIDENCE OF MRS ISOMAKI.	336502	5369925	L	FURNACE OIL	800	L	PRIVATE RESIDENCE-900L FURNACE OIL TO HOUSE AND YARD, TANK LEAK.	P	Soil contamination	0
9800009086	18-Sep-98	THUNDER BAY CITY	807 RED RIVER ROAD			L	GASOLINE	9	L	BEAVER GAS STATION- 9L GASOLINE TO PUMP ISLAND AREA, CLEANED.	N	Soil contamination	90
9800009130	19-Sep-98	THUNDER BAY CITY	KAMINISTIKIA RIVER			W	MILL EFFLUENT	300	M3	AVENOR: 300M3 UNTREATED MILL EFFLUENT TO RIVER DUE TO POWER FAILURE.	P	Water course or lake	0
9800009743	8-Oct-98	THUNDER BAY CITY	300 106 ST., MISSION ISLAND.	333993	5360182	L	DIESEL FUEL	10	L	PETRO-CANADA TERMINAL-10 L DIESEL LEAK, TANKER OVERFILL, CLEANING UP.	N		90
9800009906	14-Oct-98	THUNDER BAY CITY	PIKANGIKUM FIRST NATION			L	DIESEL FUEL		UNK	UNKNOWN-DIESEL FUEL SPILL TO GRND. DUE TO VALVE LEAK. AMOUNT UNKNOWN.	P	Soil contamination	50
9800010022	17-Oct-98	THUNDER BAY CITY	HWY 102 AND HUNTER ROAD, NW CORNER	330057	5371229	L	DIESEL FUEL	3	L	DAWSON ROAD TRUCK STOP- RESIDENT REPORTS DIESEL SPILL TO DITCH.NSP-ERP.	N		100
9800010053	19-Oct-98	THUNDER BAY CITY	VANHORNE STREET BETWEEN ALGOMA & COURT.			LW	SEWAGE,RAW UNCHLORINATED		UKN	THUNDER BAY WORKS-SEWER COLLAPSE, DILUTE SEWAGE OVERFLOW TO STREET.	N	Water course or lake	10
9800010190	19-Oct-98	THUNDER BAY CITY	490 MAUREEN STREET			W	WASTEWATER N.O.S.		UNK	CONNOR PACIFIC -DISCHARGE OF WASTE WATER FROM SITE REMEDIATION.	P	Water course or lake	0

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9800010416	31-Oct-98	THUNDER BAY CITY	CP RAIL YARD,TRACK E-20.			A	GASOLINE		UKN	CP RAIL-SLIGHT LEAK OF GASOLINE FROM TANKCAR, GASKET LEAK,EVAPORATING.	N		0
9800010584	6-Nov-98	THUNDER BAY CITY	DAWSON ROAD TRUCK STOP.			L	DIESEL FUEL	20	L	DAWSON ROAD TRUCK STOP MINOR FUEL SPILL TO LAND.	N	Soil contamination	90
9800010881	15-Nov-98	THUNDER BAY CITY	CN ORE DOCKS, THUNDER BAY HARBOUR			L	WASTEWATER WITH AROMATICS	227.5	L	NORTHERN WOODS REMEDIATN SITE: 228 L CONTAM WATER TO CONCRETE PAD.CLEANING.	N		0
9800010932	17-Nov-98	THUNDER BAY CITY	300 106TH STREET (MISSION ISLD)	333993	5360182	LW	DIESEL FUEL	15	L	PETRO-CAN- 12L DIESEL TO GND & 3L TO C/B DUE TO LEAK FROM TRUCK, CLN'D.	N		75
9800011017	20-Nov-98	THUNDER BAY CITY	KAMINISTIKWA RIVER			W	COOLING WATER		UKN	BOWATER-1.5 HOUR RELEASE OF COOLING WATER WITH PH BELOW 6.	P	Water course or lake	0
9800011563	8-Dec-98	THUNDER BAY CITY	CAM RIVER			W	TURPENTINE		UNK	BOWATER- TURPENTINE TO MILL SEWER SYSTEM WHEN A TANK EXPLODED.	P	Water course or lake	10
9800011646	11-Dec-98	THUNDER BAY CITY	HWY 11/17, ACROSS FROM FOURWAY SCHL \@DAWSON ROAD LOTS			L	TRANSFORMER OIL		UNK	ONT HYDRO- UNK QTY XFMR OIL TO GND, CUSTOMER KNOCKED OVER POLE.	P	Soil contamination	98
9800012055	29-Dec-98	THUNDER BAY CITY	608 JAMES STREET			L	TRANSFORMER OIL	112.5	L	THUNDER BAY HYDRO- 112.5 L OF TRANSFORMER OIL TO GROUND. CONTAINED.	P	Soil contamination	90
9800012065	29-Dec-98	THUNDER BAY CITY				L	HYDROGEN PEROXIDE (MORE THAN 60%)		UKN	BOWATER-UKN QTY HYDROGEN PEROXIDE TO RAILBED AND W.W.T.P.,GASKET LEAK.	N		0
9900000547	21-Jan-99	THUNDER BAY CITY	CN NEEDING YARD.			L	DIESEL FUEL	2000	L	CN RAIL -1500 TO 2000 L DIESEL FUEL TO RAIL FROM FUEL TANK PUNCTURE.	P	Soil contamination	0
9900000802	28-Jan-99	THUNDER BAY CITY	BOWATER PULP AND PATER			W	SODIUM CHLORATE (SOLUTION)	100	L	BOWATER PULP AND PAPER 100L SODIUM CHLORATE TO CLEAN WATER OUTFALL.	N	Water course or lake	
9900000943	2-Feb-99	THUNDER BAY CITY	608 JAMES STREET			L	WHITE WATER (PULP MILL WASTE)	900	L	LONGLAC WOOD INDUSTRIES- SPILL OF 900 L OF POND THAW WATER TO GRD.	P	Soil contamination	90
9900000980	3-Feb-99	THUNDER BAY CITY				L	SEWAGE,RAW UNCHLORINATED			LAKEHEAD UNIVERSITY-UKN QTY RAW SEWAGE TO GROUND,BURST PIPE,CONTAINED.	P	Soil contamination	0
9900001052	5-Feb-99	THUNDER BAY CITY	251 DOWNING ST.			L	TRANSFORMER OIL	90	L	THUNDER BAY HYDRO- 90 L OF TRANSFORMER OIL TO GROUND. CONTAINED.	P	Soil contamination	90
9900001463	19-Feb-99	THUNDER BAY CITY	701 NORAH CRESCENET	332992	5362808	L	DEFOAMING AGENT (N.O.S.)	225	L	DIACHEM- 225 L OF DEFOAMER TO GROUND WHILE OFF-LOADING TRUCK.	N		0
9900001901	6-Mar-99	THUNDER BAY CITY	316 HECTOR DOUGALL WAY (AIRPORT)	328246	5360054	L	AVIATION FUEL (JET A OR B, TURBO)	35	L	SHELL CANADA- SPILL OF 35 L JET A-1 FUEL TO BERMED AREA FROM TANK LEAK.EPS.	P	Soil contamination	90
9900002445	24-Mar-99	THUNDER BAY CITY	PASCOL ENGINEERING SHIPYARD, THUNDER BAY HARBOUR			W	PETROLEUM OIL (N.O.S.)	22.5	L	UNKNOWN M/V- APPROX. 22.5 L OIL TO ICE ON THUNDER BAY HARBOUR.	P	Water course or lake	0
9900002471	25-Mar-99	THUNDER BAY CITY	AT RAIL YARD AT THE PETRO-CANADA HOLDING TRACK			L	GASOLINE	200	L	C.P. RAIL - 200 L OF GASOLINE TO RAILBED FROM TANKER RAILCAR.	C	Soil contamination	0
9900002541	27-Mar-99	THUNDER BAY CITY	PETRO-PASS AT 720 HEWITSON STREET	333029	5363721	L	DIESEL FUEL	80	L	PETRO PASS 0 70-80 L DIESEL TO GROUND, CONTAINED, CLEANING.	N	Soil contamination	80
9900002594	29-Mar-99	THUNDER BAY CITY	HARBOUR			W	PETROLEUM OIL (N.O.S.)		UKN	SOURCE UNKNOWN - LIGHT OIL SHEEN ON WATER. UNRECOVERABLE.	P	Water course or lake	0
9900002821	5-Apr-99	THUNDER BAY CITY	MOUNT MCCAY LOOKOUT			L	TRANSFORMER OIL		UNK	CANTEL: UNKNOWN QUANTITY OF TRANSFORMER OIL LEAKED TO SOIL.	P	Soil contamination	70
9900002987	8-Apr-99	THUNDER BAY CITY	316 HECTOR DOUGALL WAY (AIRPORT)	328246	5360054	L	AVIATION FUEL (JET A OR B, TURBO)	20	L	SHELL CANADA- SPILL OF 20 L JET A-1 FUEL & WATER TO GRD AND DITCH.CLEANING	P	Soil contamination	90
9900003101	12-Apr-99	THUNDER BAY CITY	WEST FORT YARD			L	POTASH (POTASSIUM CHLORIDE)	20	TON	C.P.RAIL- 20 TONNES OF POT ASH FROM HOPPER CAR TO TRACK AND GROUND.	P	Soil contamination	0
9900003462	21-Apr-99	THUNDER BAY CITY	500 MCNAUGHTON STREET			L	DIESEL FUEL	400	L	CPR: 400L DIESEL SPILLED DURING AN ENGINE FILL. CONTAINED.			70
9900003595	25-Apr-99	THUNDER BAY CITY	914 RED RIVER RD.	333676	5368550	L	GASOLINE	30	L	PRIVATE CAR-30 L GASOLINEONTO S.S. PROPERTY,CAR TKDAMAGED,FD,CONTND/CLEANED	N		90
9900003735	28-Apr-99	THUNDER BAY CITY	108TH AVENUE			L	OIL (PETROLEUM BASED, NOT SPECIFIED)		UKN	BACKENTRY: OIL SPILLED TOROADWAY; MOE RESPONDED.	P	Multi Media Pollution	0
9900003858	2-May-99	THUNDER BAY CITY	1126 NEEBING AVE			A	SALT CAKE		UKN	BOWATER-SALT CAKE FALLOUTTO RESIDENT CAR,PROPERTY.PRECIP PROBLEMS-FIXING.	C	Air Pollution	0
9900003979	4-May-99	THUNDER BAY CITY	AT THE CORNER OF GRENVILLE AND RITA			L	FLOOR CLEANING LIQUID (N.O.S.)	20	L	LAKEHEAD FREIGHTWAYS: 20 L CLEANING FLUID TO GRND,CLEANED UP.	P	Soil contamination	90
9900004307	13-May-99	THUNDER BAY CITY	914 RED RIVER RD.	333676	5368550	L	GASOLINE	30	L	TIL-KA CONSTRUCTION:30 L GASOLINE TO LOT,CAR TANK DAMAGED,FD,CONTND/CLEANED	N		90
9900004652	22-May-99	THUNDER BAY CITY	IN FRONT OF 2236 WEST ARTHUR STREET.	324613	5361329	L	GASOLINE		UKN	PRIVATE AUTO-UKN QTY GASOLINE TO DITCH,MVA, FD ONSITE.	P	Soil contamination	0
9900004877	29-May-99	THUNDER BAY CITY	665 THORNLOE DRIVE.	329801	5361836	L	GASOLINE	45	L	PRIVATE CAR-45 L GASOLINEONTO GROUND, DRAIN & WEE-PING TILES, FD. CLEANED.	C	Soil contamination	50

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9900005529	14-Jun-99	THUNDER BAY CITY	WEST END OF TB AIRPORT, ADJACENT TO CP RAIL LINE.			L	AVIATION FUEL (JET A OR B, TURBO)		UKN	THUNDER AIR LINES- UNK QUANT JET FUEL TO DITCH AFTER AIR CRASH,MOE,BOOMS	P	Water course or lake	10
9900006035	25-Jun-99	THUNDER BAY CITY				A	SALT CAKE		UKN	BOWATER-CALLER COMPLAINT OF SALT CAKE SNOWING ON HER BACK YARD AND HOUSE	C	Air Pollution	
9900006112	27-Jun-99	THUNDER BAY CITY	1075 CARRICK ST	333513	5363757	L	TRANSFORMER OIL	9.1	L	THUNDER BAY HYDRO-9.1 L NON-PCB X-FORMER OIL TO GND ONLY.CLEANING.	C	Soil contamination	0
9900007213	24-Jul-99	THUNDER BAY CITY	9427 JOHN ST (MUNICIPAL WDS)	323886	5367045	LA	PHENOLIC RESINS (COMBUSTED)		UKN	THUNDER BAY JOHN ST WDS- SMALL QTY PHENOLIC RESININ RUBBISH FIRE.F/D,W/D.	P	Multi Media Pollution	0
9900007309	26-Jul-99	THUNDER BAY CITY	HWY 11 4 KM EAST OF KINGHORN RD			L	GASOLINE/OIL MIXTURE	4	L	PVT OWNR: 5L SPILL OF GASOIL TO GRND FATAL MVA F/DHAS EFFECTED CLEANUP	P	Soil contamination	
9900008841	4-Sep-99	THUNDER BAY CITY	KAMINISTQUIA RIVER			W	BLACK LIQUOR		UKN	BOWATER PULP & PAPER - 8 MIN. RELEASE OF BLACKLIQUOR TO KAMINISTQUIA R.	C	Water course or lake	0
9900008986	8-Sep-99	THUNDER BAY CITY	217 WEST ARTHUR ST.	331020	5361202	L	TRANSFORMER OIL		UNK	THUNDER BAY HYDRO- SPILL OF NON-PCB TRANSFORMER OIL TO GRD. CLEANING.	C	Soil contamination	70
9900009430	20-Sep-99	THUNDER BAY CITY	126 IRIS CRES.	333456	5370140	L	TRANSFORMER OIL		UKN	THUNDER BAY HYDRO- UNK QUANT NON PCB'S X-FORMER OIL TO GRAVEL,WILL CLEAN.	C	Soil contamination	0
9900009479	21-Sep-99	THUNDER BAY CITY	300 106TH STREET (MISSION ISLD)	333993	5360182	L	DIESEL FUEL	200	L	PETRO-CAN-200L DIESEL TO PAVEMENT AND SOME TO OIL/WATER SEPARATOR. CLN'D.	N		90
9900010545	21-Oct-99	THUNDER BAY CITY	2135 SILLS ST AT 5 MILE SCHOOL.	331966	5361260	L	ETHYLENE GLYCOL (ANTIFREEZE)		UKN	5 MILE SCHOOL-UNK QUANT ANTIFREEZE ONTO CRAWL SPACE FROM HEATING SYSTEM	C	Soil contamination	0
9900010561	21-Oct-99	THUNDER BAY CITY	AGORA CIRCLE (LAKEHEAD U CAMPUS), AND OLIVER ST (IN FRONT OF MAIN ENTRANCE)	332733	5365746	LW	DIESEL FUEL		UKN	THUNDER BAY TRANSIT-UKN QTY DIESEL TO ROAD, 3 B- BASINS.CONTAINED/CLEANED.	N		95
9900010692	25-Oct-99	THUNDER BAY CITY	1908 WEST FREDERICA ST.	328929	5359419	L	TRANSFORMER OIL		UKN	THUNDER BAY HYDRO- X-FOR-MER OIL ONTO RD/GRASS DUETO MVA, CLEANING UP.	P	Soil contamination	0
9900010767	27-Oct-99	THUNDER BAY CITY	CNR NORTH YARD.			L	DIESEL FUEL	45	L	CANADIAN NATIONAL RAILW.-TANK OVERFLOW INTO DYKE &45 L DIESEL ONTO GRAVEL.	P	Soil contamination	90
9900011371	14-Nov-99	THUNDER BAY CITY				L	SULPHURIC ACID	100	L	BOWATER: 100 L OF 93% SULPHURIC ACID TO SOIL, NEUTRALIZED.	P	Soil contamination	90
9900011515	19-Nov-99	THUNDER BAY CITY	ON HWY. 1117 BETWEEN BALSAM & RED RIVER STREETS			L	DIESEL FUEL	900	L	TRANSPORT TRUCK - 900 L OF DIESEL FUEL TO HWY. FROM SADDLE TANKS.	P	Soil contamination	0
9900011632	23-Nov-99	THUNDER BAY CITY	ON HWY. 61 AND CLOUD RIVER, 200 YARDS FROM THE CREEK			L	DIESEL FUEL	800	L	MONSON TRUCKING - 800 L OF DIESEL FUEL TO HWY. FROM SADDLE TANKS. MVA.	P	Soil contamination	0
9900011633	23-Nov-99	THUNDER BAY CITY	ON HWY. 11 AT PITPAGMI HILL			L	DIESEL FUEL	200	L	AMAN TRUCKING - 200 L OF DIESEL FUEL TO HWY. FROM SADDLE TANKS. MVA.	P	Soil contamination	0
9900011665	24-Nov-99	THUNDER BAY CITY	KM 48, GRAHAM RD.			L	DIESEL FUEL	200	L	BUCHANAN FOREST PRODUCTS-MVA, 200 L DIESEL ONTO RDFROM TRUCK, CLEANED UP.	N	Soil contamination	95
9900011774	28-Nov-99	THUNDER BAY CITY	RIVERSIDE GRAIN PRODUCTS, 675 NEW VICKERS ST.	333273	5360243	L	TREATED EFFLUENT (N.O.S.)		UKN	RIVERSIDE GRAIN-UKN QTY TREATED EFFLUENT TO GRND FROM TANK OVERFLOW,FD,CCG	P	Soil contamination	0
9900012560	22-Dec-99	THUNDER BAY CITY	AT JNW CONFECTIONARY, 100 CITY ROAD			L	GASOLINE	400	L	JNW CONFECTIONARY: 400 L GASOLINE TO GROUND WHEN TANK OVERFILLED, F.D.	P	Soil contamination	90
9900012569	23-Dec-99	THUNDER BAY CITY	BANNONS GAS BAR AT FORT WILLIAM INDIAN RESERVE.			L	GASOLINE	400	L	MURPHY OIL:200-400L GAS SPILL AT GAS BAR DURING FUEL DELIVERY.CLEANED.	P	Soil contamination	90
9900012639	27-Dec-99	THUNDER BAY CITY	1580 WEST ARTHUR ROAD	327331	5361027	L	FURNACE OIL	500	LIT	OMNR- SPILL OF 500 L OF FURNACE OIL TO GROUND-NO SURFACE WATER IMPACTS	C	Soil contamination	90
9900013132	13-Jan-00	THUNDER BAY CITY	AT SANTAROLLIS TRUCK STOP, HWY 17			L	USED MOTOR OIL	500	L	BACKENTRY-SANTAROLLIS TRUCK STOP: 500 L OF OIL TO PARKING LOT,CONTAINED.	P	Multi Media Pollution	0
9900013972	14-Feb-00	THUNDER BAY CITY	THUNDER BAY TERMINAL			L	DIESEL FUEL	456	LIT	C.P. RAIL: 456 L DIESEL FUEL SPILLED TO TERMINAL FLOOR-CLEAN UP ON-GOING	P	Soil contamination	0
9900014290	24-Feb-00	THUNDER BAY CITY				L	FUEL (N.O.S.)		UKN	BACK ENTRY/BUCHANAN: FUEL SPILL FROM FUEL TRUCK UKN QTY. NOT CELANED UP.	P	Multi Media Pollution	0
9900014677	6-Mar-00	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	WHITE WATER (PULP MILL WASTE)	26	M^3	BOWATER P & P CAN: SPILL OF MILL WATER TO RIVER- NO ADVERSE EFFECT EXPECT.	P	Water course or lake	0
9900015374	28-Mar-00	THUNDER BAY CITY	IN DITCH ON ONION LAKE ROAD, JUST PAST IMPERIAL TRAILER COURT, ON LEFT SIDE			L	GASOLINE	60	L	PRIVATE VEHICLE: 60 L OF GASOLINE TO DRY ROADSIDE DITCH, SOAKED INTO SOIL.	C	Soil contamination	0
9900015495	31-Mar-00	THUNDER BAY CITY	ALLOY & BALMORAL STREETS	332892	5364193	L	HYDRAULIC OIL	30	L	BFI TRUCK-25 L HYDR OIL TO RD, RUPTURED LINE. NO C-B IMPACTED. W/D.	N		0
9900016365	24-Apr-00	THUNDER BAY CITY				L	GASOLINE	200	L	PETRO CAN: 200 L GAS SPILL DUE TO LEAKY PIPE. CONTAINED/CLEANED.	P	Soil contamination	99
9900016504	28-Apr-00	THUNDER BAY CITY	1 NAUTICAL MILE EAST OF SOUTH ENTRANCE IN THUNDER BAY HARBOUR			W	OIL (PETROLEUM BASED, NOT SPECIFIED)	UNK		UNK SOURCE: 3 M OIL SHEENIN THUNDER BAY HARBOUR. UNRECOVERABLE.CCG	P	Water course or lake	0
9900016770	2-May-00	THUNDER BAY CITY	AT THE CLOSED POOL 4 ELEVATOR ON SHIPYARD RD.			L	TRANSFORMER OIL (N.O.S.)	2700	L	CITY OF THUNDER BAY-2700 L OF MINERAL OIL TO ASPHALT FROM TRANSFORMER.	N		100

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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9900016883	8-May-00	THUNDER BAY CITY	316 HECTOR DOUGALL WAY (AIRPORT)	328246	5360054	L	AVIATION FUEL (JET A OR B, TURBO)	35	L	SHELL CANADA- SPILL OF 35 L JET A-1 FUEL TO GRD. AIRCRAFT VALVE FAILURE.	N	Other	100
9900017065	11-May-00	THUNDER BAY CITY				A	NON-CONDENSIBLE GASES		UKN	BOWATER - NCG'S VENTED TO ATMOSPHERE FOR 45 MINUTES.	P	Air Pollution	0
9900017153	13-May-00	THUNDER BAY CITY	JAMES STREET FROM WALSH TO ARTHUR/WEST ON ARTHUR OUT OF CITY			L	DIESEL FUEL		UNK	TRANSPORT TRUCK: SPILL ONROAD FROM SADDLE TANK (MINOR LEAK).WORKS, FD.	P	Multi Media Pollution	0
9900017206	14-May-00	THUNDER BAY CITY				LA	BLACK LIQUOR		UKN	BOWATER-BLACK LIQUOR MISTTO EMPLOYEE PKG LOT FROM RELIEF VALVE.WASHING CARS	N		0
9900017651	25-May-00	THUNDER BAY CITY	BETWEEN DOG RIVER RD. AND MUSKEG LAKE ON A TERTIARY ROAD 17.5KM OF HIGHWAY			L	DIESEL FUEL	20-30	L	GROUND ZERO: 20 TO 30L OFDIESEL TO GROUND,NOT CONTAINED OR CLEANED.	P	Groundwater pollution	0
9900017824	30-May-00	THUNDER BAY CITY	KAMINISTIKWIA			L	DIESEL FUEL	90	L	HURST:90 L DIESEL TO GRD FROM TRUCK - LEAKY PIPE. CLEANING UP.	P	Soil contamination	50
9900018307	9-Jun-00	THUNDER BAY CITY				L	SODIUM HYPOCHLORITE	225	L	ABITIBI-PRICE - 225 L OF SODIUM HYPOCHLORITE TO GROUND FROM LEAKY LINE.	C	Soil contamination	0
9900018308	9-Jun-00	THUNDER BAY CITY				L	RESIN N.O.S.	25	L	ABITIBI-PRICE - 25 L OF RESIN NET FLOCK TO GROUNDWHILE OFF-LOADING.	C	Soil contamination	0
9900018954	22-Jun-00	THUNDER BAY CITY				L	DIESEL FUEL		UKN	TRANSPORT TRUCK-UKN QTY DIESEL TO HWY FROM PULLEDFUEL LINE; MTO, OPP.	N		0
9900019004	23-Jun-00	THUNDER BAY CITY	LAKE SUPERIOR, THUNDER BAY HARBOUR, BESIDE UNITED GRAIN ELEVATOR DOCKS			W	OIL (PETROLEUM BASED, NOT SPECIFIED)		UKN	UKN SRC-30 X 200M OIL SLICK NEAR THUNDER BAY HARBOUR DOCKS.CCG CLEAN	C	Water course or lake	0
9900019159	26-Jun-00	THUNDER BAY CITY	300 106 ST MISSION ISLAND.	333993	5360182	L	DIESEL FUEL	50	L	PETRO-CANADA TERMINAL-50 L DIESEL ONTO APRON,ERRORCLEANED UP.	N		99
9900042877	27-Jul-00	THUNDER BAY CITY	277 NORTH CUMBERLAND ST, THUNDER BAY.	336716	5367917	L	PAINT (WATER-BASED)	20	L	SHELL SERVICE STN - 20 L PAINT SPILLED TO GND FROM WASTE DISPOSAL TRUCK	P	Soil contamination	0
9900021514	17-Aug-00	THUNDER BAY CITY	CAN-OP OIL \@910 COMMERCE ST.			L	MOTOR OIL	300	L	BACK ENTRY: CAN-OP OIL: 300 L MOTOR OIL TO GROUND. FITTING VALVE FAILED.	N	Soil contamination	
9900021731	25-Aug-00	THUNDER BAY CITY	MOUNTAIN ROAD AND CHIPPEWA ROAD			L	DIESEL FUEL	UNK		PELLETIER GAS STATION: DIESEL FUEL SPILL- FIRE, PUBLIC WORKS, TSSA NOTIFY	C	Soil contamination	
9900022443	6-Sep-00	THUNDER BAY CITY	MAINSTREET, CENTRAL AVENUE AND BALMORAL TO HARBOUR EXPRESSWAY, ON ROADWAY			L	HYDRAULIC OIL	8	L	UNKNOWN: HYDRAULIC OIL LEAK TO 6 KM OF ROADS IN TB, WORKS CLEANING UP	P	Soil contamination	0
9900023161	17-Sep-00	THUNDER BAY CITY				L	FORMALDEHYDE (N.O.S.)	20	L	BOWATER: SLOW LEAK IN TANKER TRUCK ON SITE, 20 L OF 1% FORMALDEHYDE SOLN	P	Soil contamination	0
9900023564	24-Sep-00	THUNDER BAY CITY	SHELL STATION (#20347) SW CORNER OF LOT			L	GLYCOL/WATER SOLUTION	3	L	SHELL/TSSA: SPILL OF 3L OF ANTIFREEZE IN LOT, UNKNOWN SOURCE	P	Soil contamination	90
9900023831	29-Sep-00	THUNDER BAY CITY	HWY#527 TOWARDS ARMSTRONG			L	DIESEL FUEL	25	L	PYE FUELS (DITTMAR'S) DIESEL TO GROUND,NO WATERCONTAINED ,CLEANED UP	P	Soil contamination	100
9900024385	8-Oct-00	THUNDER BAY CITY	LANEWAY ACROSS FROM 1006 RIDGEWAY			L	UNKNOWN			SOURCE UKN-UKN MATERIAL DUMPED IN LANEWAY CAUSINGODOURS.WORKS.	P	Soil contamination	0
9900024392	9-Oct-00	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	20	L	SHELL CANADA- 20 L OF JET FUEL TO PAVEMENT WHILE FUELING AIRCRAFT.	N	Other	100
9900024463	11-Oct-00	THUNDER BAY CITY	ABITIBI PRICE INC. FORT WILLIAM SITE			L	WASTEWATER (HIGH BOD)	2000	L	ABITIBI-PRICE INC. 2000L OVERFLOW BROKE TANKTO GROUND, CLEANED.	N	Soil contamination	90
9900024590	13-Oct-00	THUNDER BAY CITY	CHIPPAWA RD, BETWEEN HWY 61 & JANE			L	CONTAMINATED SOIL	1000	KG	J.U. CALONEGO CONST: 1000 KG GAS-CONTAMINATED SOIL TO ROADWAY. CLEANING.	N		0
9900025386	26-Oct-00	THUNDER BAY CITY	EXPRESSWAY (HWY 11-17) AT OLIVER	331008	5365393	L	UNKNOWN		UKN	SOURCE UNKNOWN:UKN AMOUNTOPERATING FLUID TO ROAD -WAY. WORKS.	P	Multi Media Pollution	0
9900027074	24-Nov-00	THUNDER BAY CITY	HAMMOND AVE TRUNK SEWER			L	SEWAGE,RAW UNCHLORINATED	150000	L	THUNDER BAY SEWER: FORCE-MAIN RUPTURED 150,000L SEWAGE TO EXCAVATION PIT	P	Soil contamination	80
9900027353	29-Nov-00	THUNDER BAY CITY	LAKE SUPERIOR, THUNDER BAY NEAR P & H GRAIN ELEVATOR			W	PETROLEUM OIL (N.O.S.)		UKN	UNKNOWN SOURCE:CLEAR SHEEN IN PORT OF THUNDER BAY.MATERIAL UNK. CCG	P	Water course or lake	0
9900027366	29-Nov-00	THUNDER BAY CITY	LAKE SUPERIOR, THUNDER BAY HARBOUR			W	GRAIN		UKN	GRAIN BOAT: SUSPECTED SPILL OF OIL - TRANSPORT CANADA -> GRAIN ON WATER.	N		0
9900027699	5-Dec-00	THUNDER BAY CITY	CPR RIGHT OF WAY, HWY 17 W OF TB, CITY LIMITS & OLIVER-PALIPOONGE TOWNSHIP			A	SMOKE		UKN	UNKNOWN: 1 KM OF DENSE SMOKE ACROSS HWY 17. CHOKING SMOKE.	P	Air Pollution	0
9900028964	4-Jan-01	THUNDER BAY CITY	CN RAIL - NEEBING YARD			L	GASOLINE	1	L	SHELL/PETRO CANADA:SPILL 1 L OF GASOLINE DRIPPED FROM LEAKING TANKER.	P	Soil contamination	95
9900029333	13-Jan-01	THUNDER BAY CITY	914 RED RIVER ROAD			L	GASOLINE	68	L	PRIVATE OWNER,MOTOR VEHICLE:SPILL OF 68 L GASDUE TO SPLIT TANK.CLEANED	N	Other	90
9900029957	26-Jan-01	THUNDER BAY CITY	PICTON ST/WALKOVER ST.			L	TRANSFORMER OIL (N.O.S.)		UKN	THUNDER BAY HYDRO- UNK QUANT X-FORMER OIL(2 PPM PCB'S) TO SNOW, CLEANING.	N		0
9900031159	16-Feb-01	THUNDER BAY CITY	BOWATER MILL, THUNDER BAY			L	BLACK LIQUOR		UKN	BOWATER: SPILL OF BLACK LIQUOR MIST TO GROUND. CONTAINED, NO WATER IMPTS	P	Soil contamination	0

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9900031935	3-Mar-01	THUNDER BAY CITY	336 EAST CHRISTINA	332246	5359926	L	FURNACE OIL AND WATER MIXTURE	200	L	PRIVATE RESIDENCE FURNACE OIL SPILL TO GROUND		Soil contamination	0
9900032661	17-Mar-01	THUNDER BAY CITY	1735 CITY ROAD.	335567	5356690	L	BUNKER FUEL OIL (NO. 4, 5 OR 6)	200	L	ABITIBI-PRICE-200 L BUN- KER C OIL ONTO SNOW, TK OVERFLOW, CLEANING UP.	N		0
9900032838	21-Mar-01	THUNDER BAY CITY	AT ATLANTIC & 1 TENTH AVE.			L	HYDRAULIC OIL	2.5	L	THUNDER BAY HYDRO - 2.5 L OF HYDRAULIC OIL TO LAND FROM TRUCK.	N		100
9900033073	25-Mar-01	THUNDER BAY CITY	BOWATER PROPERTY AT RECYCLE WHAREHOUSE.			L	DIESEL FUEL	200	L	MONSON TRUCKING-200 L DIESEL TO GRAVEL ROAD IN BOWATER,CLEANUP UNDERWAY.	P	Soil contamination	99
9900034402	15-Apr-01	THUNDER BAY CITY	FEEDER CREEK TO LAKE SUPERIOR, PEARL (60 KM EAST OF THUNDER BAY)			W	GASOLINE		UKN	PRIVATE AUTOMOBILE: MVA CAR UPSIDE DOWN IN CREEK SOME FUEL TO CREEK.	P	Water course or lake	0
9900034808	20-Apr-01	THUNDER BAY CITY	1510 DAWSON RD	331442	5370374	L	AVIATION FUEL (JET A OR B, TURBO)	199	L	BROLAND ENTERPRIZES INC.:100 L TURBO FUEL TO GROUN-D OFFSITE FROM DRUMS.	P	Water course or lake	0
9900034934	22-Apr-01	THUNDER BAY CITY	GERNAT HOME, 1048 GREENGATE CIRCLE	324805	5354290	L	DIESEL FUEL	60	L	GERNAT AGST: SPILL OF 60 L OF DIESEL FUEL ON THE GROUND. WILL CLEAN.	P	Soil contamination	0
9900035381	27-Apr-01	THUNDER BAY CITY	FORT WILLIAM HIGH SCHOOL,512 SOUTH MARKS STREET.	333132	5360643	L	MERCURY		UKN	FORT WILLIAM HIGH SCHOOL-UKN QTY MERCURY TO SOUTH PARKING LOT,CLEANED-UP.	P	Multi Media Pollution	99
9900035524	30-Apr-01	THUNDER BAY CITY	307-309 MAIN STREET ATIKOKAN, ON			L	OIL (PETROLEUM BASED, NOT SPECIFIED)	40	L	UKN: ATIKOKAN FUEL TANK SPILLED IN HOLE 20-40 L DEISEL FUEL			0
9900035559	30-Apr-01	THUNDER BAY CITY	1758 ROSLYN RD.	326498	5359181	L	GASOLINE		UKN	PRIVATE CAR - GASOLINE TOROAD FROM PRIVATE AUTO THAT OVER-TURNED.	P	Soil contamination	0
9900035906	4-May-01	THUNDER BAY CITY	1520 DAWSO RD (ADJACENT PROPERTY)	331374	5370404	L	WASTE OIL	25	LIT	25 L WASTE OIL ON GROUND SOME ON ADJACENT PRPERTY ORDER ISSUED	P	Multi Media Pollution	0
9900036078	7-May-01	THUNDER BAY CITY	JACKNIFE BRIDGE UP TO FREDERICA AVE.			L	DIESEL FUEL		UKN	SOURCE UNKNOW-UNK QUANT OF FUEL ONTO ROAD, WORKS WILL SAND ROAD/CHECK C.B.	P	Soil contamination	0
9900036656	15-May-01	THUNDER BAY CITY	LAKE SUPERIOR THUNDER BAY GRAIN TERMINAL ELEVATOR A			W	UNKNOWN		UKN	SOURCE UNKNOWN: LIGHT OILSHEEN AROUND THUNDER BAY GRAIN ELEVATORS. UNRECOV.	P	Water course or lake	0
9900036759	16-May-01	THUNDER BAY CITY	1110 WEST ARTHUR STREET	329198	5361161	L	ETHYLENE GLYCOL (ANTIFREEZE)	2	L	SHELL STATION:2 L ANTI- FREEZE TO GROUND, CLEAN ED UP, NO SEWERS	P	Soil contamination	0
9900036965	19-May-01	THUNDER BAY CITY	MAIN STATION, THUNDER BAY			A				UNION GAS:GAGE VANDELISED 1/4 INCH HOLE,VENT FOR 1 HOUR, EVAC. REPAIRED.	P	Air Pollution	0
9900037192	23-May-01	THUNDER BAY CITY	550 SHIPYARD ROAD, T.B.	339503	5369649	L	HYDRAULIC OIL	7	L	HYDRO ONE 7L HYDRAULIC OIL TO GROUND EQUIPMENT FAILURE CLEANED UP	P	Soil contamination	90
9900039179	13-Jun-01	THUNDER BAY CITY	PASS LAKE TRUCK STOP, THUNDER BAY			L	DIESEL FUEL		UKN	PAUL'S HAULAGE: SPILL OF DIESEL FUEL - UNKNOWN AMOUNT.	P	Human health	0
9900040515	29-Jun-01	THUNDER BAY CITY	PETRO-CANADA TERMINAL 300 106TH ST. MISSION ISLAND	333993	5360182	L	DIESEL FUEL	20	L	PETRO CAN:20 L TO GROUND 10L TO OIL/WATR SEPARATOR,CONTAINED,CLEANED	N		90
9900042707	25-Jul-01	THUNDER BAY CITY	1.8 KM OUTSIDE OF HARBOUR ENTRANCE.			W	LUBRICANT OIL(LUBE OIL)	5	L	M/V"CANADIAN ENTERPRISE"-5 L SHAFT LUBE TO LAKE,NO RECOVERY.	P	Water course or lake	0
9900043100	30-Jul-01	THUNDER BAY CITY	BIRTCH T.S.,GOLFLINKS ROAD.			L	TRANSFORMER OIL (N.O.S.)	90	L	HYDRO ONE-90 L NON-PCB BREAKER OIL SOAKED INTO GROUND.	P	Soil contamination	60
9900045467	24-Aug-01	THUNDER BAY CITY	DOG RIVER AT THE 10KM MARK ON SHELBY RD, EAST OF DOG RIVER RD			LW	HYDRAULIC OIL	20	L	BOWATER: 20L HYDRAULIC OIL/DIESEL TO WATERWAY. CONTAINED AND CLEANING	P	Groundwater pollution	50
9900045874	29-Aug-01	THUNDER BAY CITY	NEEPING RIVER			LW	DIESEL FUEL	30	L	CPR: SMALL LEAK FROM LOCO-MOTIVE TO TRACK/SOME TO RIVER - 20L TOTAL SPILLED	P	Water course or lake	0
9900046322	4-Sep-01	THUNDER BAY CITY	PETRO-CANADA TERMINAL 300 106TH ST. MISSION ISLAND	333993	5360182	L	DIESEL FUEL	50	L	PETRO CAN: 50 L OF DIESEL LOADING RACK. CONTAINED AND CLEANED.	N		99
9900046456	5-Sep-01	THUNDER BAY CITY	1100 MONTREAL STREET			L	PHENOLIC RESIN	90	L	TRANSBORT TRUCKING-90 L PHENOLIC RESIN TO LOT, HOSE FAILURE,CONTAINED.	N		99
9900047653	21-Sep-01	THUNDER BAY CITY	277 NORTH CUMBERLAND STREET	336716	5367917	L	HYDRAULIC OIL		UKN	SHELL CANADA-<UKN AMOUNT OF HYDRAULIC FUEL TO CAR WASH.	N		0
9900049478	15-Oct-01	THUNDER BAY CITY	WEST ARTHUR ST AT 20TH SIDE ROAD			W	SEDIMENT(SUSPENDED SOLIDS/ SAND/ SILT)		UKN	THUNDER BAY PUC: FLUSHINGHYDRANTS CAUSING LARGE SEDIMENT AMOUNTS TO NEEBING	P	Water course or lake	0
9900053037	4-Dec-01	THUNDER BAY CITY	10920 JOHN ST ROAD			L	FURNACE OIL	500	L	PRIVATE RES:500L FURNACE OIL TO GRD.	P	Soil contamination	50
9900053038	4-Dec-01	THUNDER BAY CITY	ABITIBI-CONSOLODATED, HYPOCHLORITE LINE, AT SECONDARY CLARIFIER			L	SODIUM HYPOCHLORITE	200	L	ABITIBI-CONSOLODATED: 200L SODIUM HYPOCHLORITE TO GROUND/CONTAINMENT.	P	Soil contamination	0
9900053832	15-Dec-01	THUNDER BAY DISTRICT	167 BURWOOD RD.			W	LUBRICATING OIL/GREASE	<1	ML	THUNDER BAY TGS: < 1 ML LUBRICATING OIL TO WATER.	P	Water course or lake	0
9900053966	18-Dec-01	THUNDER BAY CITY	2517 GOVERNMENT ROAD	327068	5371025	L	TRANSFORMER OIL (N.O.S.)	50	LTR	T.BAY HYDRO: POLE MOUNT SPILL OF 50 LTRS OF OIL. CLEANED-UP.AWAITING LAB	P	Soil contamination	100
9900056341	5-Feb-02	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	DIETHYLENE GLYCOL(DIGLYCOL, DEG)	2	L	SHELL CANADA- 2 L OF METHYL CARBITOL TO RAMP CLEANED.	N	Other	100
9900057122	19-Feb-02	THUNDER BAY CITY	CN RAIL, NEBBING YARD			L	LUBRICATING OIL/GREASE	90	L	CN RAIL: 90 L LUBE OIL TO GROUND BETWEEN TRACKS BEING CLEANED.	P	Soil contamination	99
9900058908	27-Mar-02	THUNDER BAY CITY	580 LAKESHORE DR			A	NATURAL GAS (METHANE)		UKN	UNION GAS: 175 LBS NATUR-AL GAS TO ATM FOR 2 HOURS, DAMAGED PIPELINE	P	Air Pollution	0

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9900058998	30-Mar-02	THUNDER BAY CITY	27 KM EAST OF TERRACE BAY ON HWY 17			L	DIESEL FUEL	300	L	QUIK X-300L DIESEL TO GRDFROM SADDLE TANK. MVA. NO WATERCOURSES IMPACTED	P	Soil contamination	0
9900059164	5-Apr-02	THUNDER BAY CITY	THUNDER BAY HARBOUR AT UNITED GRAIN GROWERS ELEVATOR M.			L	GRAIN		UKN	CANADIAN NATIONAL RAILW.-GRAIN CAR LOAD SPILLED ATTB HARBOUR GROND,CLEANING	N		0
9900072918	30-Apr-02	THUNDER BAY CITY	1130 COMMERCE ST.	329821	5360213	L	TRANSFORMER OIL		UKN	THUNDER BAY HYDRO- UNK QUANT NON PCB'S OIL-GRND WILL CLEAN. **BACKENTRY*	P	Soil contamination	95
9900060993	16-May-02	THUNDER BAY CITY	CP RAIL YARD IN THUNDER BAY.			L	GRAIN	3	MT	CP RAIL-3 CARS DE-RAILED,3 TONNES GRAIN TO GROUND.	N		0
9900061993	29-May-02	THUNDER BAY CITY	NEEBING RIVER AT ARTHUR ST			W	SEDIMENT (SUSPENDED SOLIDS/ SAND/ SILT)		UKN	THUNDER BAY CITY:SPILL OF SEDIMENT INTO NEEBING RIVER FROM HYDRANT FLUSH	P	Water course or lake	0
9900061995	29-May-02	THUNDER BAY CITY	735 HEWITSON ST	332941	5363820	L	TRANSFORMER OIL (N.O.S.)		UKN	THUNDER BAY HYDRO- 56 L OF POSSIBLY >50 PPM PCB OIL TO GROUND.	C	Soil contamination	0
9900062422	3-Jun-02	THUNDER BAY CITY	26 HANIAK RD			L	WASTE OIL/WATER (N.O.S.)	1200	L	POTTER PUMPING: VANDALS OPENED VALVED ON TRUCK 1200L WASTE OILY/WATER	P	Soil contamination	80
9900063750	5-Jun-02	THUNDER BAY CITY	LAKE SUPERIOR AT PIER 3 MARINA.			W	UNKNOWN			SOURCE UNKNOWN-300/50 YARDS SHEEN AT PIER 3 IN THUNDER BAY,TO DISSIPATE.	P	Water course or lake	0
9900062830	7-Jun-02	THUNDER BAY CITY	KAMINISTIQUIA RIVER			W	WATER (BASIC, IE: HIGH PH)			BOWATER-FOAM TO RIVER & PH SPIKE FROM PLANT START-UP.	P	Water course or lake	0
9900063506	14-Jun-02	THUNDER BAY CITY	CLAUDE GARDEN SCHOOL			L	HYDRAULIC OIL	20	L	LAKEHEAD DISTR.SCH.BD 20L HYDRAULIC OIL TO GND FM BURST HOSE. CLEANED.	N		99
9900064030	19-Jun-02	THUNDER BAY CITY	84 ALGOMA ST,SOUTH	335252	5366966	L	WASTE OIL		UKN	FRANK SERVICE STN:WASTE OIL FROM STORAGE TANK OVERFLOWING.CITY PROPERTY			
9900065035	26-Jun-02	THUNDER BAY CITY	200 CASCADE CRESENT	332180	5367424	L	TRANSFORMER OIL		UKN	THUNDER BAY HYDRO- UNK QUANT NON PCB'S X-FORMER OIL TO GROUND,WILL CLEAN.	P	Soil contamination	95
9900068534	25-Jul-02	THUNDER BAY CITY	KEEFER TERMINAL- THUNDER BAY HARBOUR	335567	5356690	WL	HYDRAULIC OIL	1	GAL	THUNDER BAY HARBOUR: 1 GALLON OF HYDRAULIC OIL TO WATER FROM CRANE	P	Water course or lake	
9900069394	1-Aug-02	THUNDER BAY CITY	FORT WILLIAM DIVISION MILL 1735 CITY ROAD	330786	5359916	L	WASTEWATER N.O.S.		UKN	ABITIBI: SECONDARY CLARIFIER OVERFLOW: TREATED EFFLUENT	P	Water course or lake	
9900071307	17-Aug-02	THUNDER BAY CITY	263 MARY ST. W			L	TRANSFORMER OIL (N.O.S.)	45	L	HYDRO ONE: 45 L OF OIL TO GROUND FROM TRANSFORMER POLE	P	Soil contamination	95
9900072011	23-Aug-02	THUNDER BAY CITY	FORT WILLIAMS MILL			L	WASTEWATER N.O.S.		UKN	ABITIBI-PRICE:SEC CLARIF-IER OVERFLOW, MAY BE PLUGGED LINE	P	Water course or lake	0
9900073576	6-Sep-02	THUNDER BAY CITY	408 FREDRICK ST W			L	GASOLINE	30	L	BEAVER GAS STN: 30L GAS TO CEMENT PAD, NO DRAINS IMPACTED, CLEANING	N	Soil contamination	99
9900074752	17-Sep-02	THUNDER BAY CITY	700 MONTREAL ST., KAMINISTIQUIA RIVER	330262	5358203	AW	SMOKE		UKN	HARBOUR METALS: SMOKE TO ATM & FIRE WATER TO RIVER. FD. MOE.	P	Air Pollution	0
9900076819	9-Oct-02	THUNDER BAY CITY	THUNDER BAY AIRPORT	327805	5360339	L	AVIATION FUEL (JET A OR B, TURBO)	4	L	MAINTAIR AVIATION: 4 L OF JET FUEL TO PAVEMENT FROM AIRCRAFT REFUELLER	N	Other	100
9900077200	13-Oct-02	THUNDER BAY CITY	HACQUOIL CONSTRUCTION \@729 MAUREEN STREET	335077	5364365	L	ASPHALT		UKN	HACQUOIL CONSTRUCTION: SPILL OF ASPHALT TO GROUND, TANK EXPLOSION	P	Soil contamination	0
9900077830	21-Oct-02	THUNDER BAY CITY	KAMINISTIQUIA RIVER.			W	SEWAGE,RAW CHLORINATED		UKN	BOWATER PULP & PAPER- IN-TERMITTENT CHLORINATED RAW SEWAGE BYPASS TO RIV.	P	Water course or lake	0
@	3-Feb-92	GORHAM TOWNSHIP (UNORGANIZED)	AT THE CENTRA GAS COMPRESSOR STATION ONION LAKE RD. 1/4 MI. PAST PIKE LAKE RD			L	WASTEWATER WITH ETHYLENE GLYCOL	2250	L	CENTRA GAS - 2250 L OF GLYCOL/WATER MIXTURE TO GROUND AT COMPRESSOR ST'N	P	Soil Contamination	99
@	7-Sep-92	GORHAM TOWNSHIP (UNORGANIZED)	CONCESSION 4 3 KM EAST OF HWY589			L	DIESEL FUEL	90	L	DUMP TRUCK: 67-90L DIESELFUEL TO SIDE OF ROAD WHENDUMP TRUCK OVERTURNED.	C	Soil contamination	99
9300013508	2-Dec-93	GORHAM TOWNSHIP (UNORGANIZED)	SPRINGDALE TRAILER PARK, UNIT #4			L	FUEL OIL	300	L	PRIVATE: 300 L FUEL OIL TO FROZEN GROUND FROM STORAGE TANK.	N	Soil contamination	100
9800001730	23-Feb-98	GORHAM TOWNSHIP (UNORGANIZED)	ON HWY. 102, 2 KM WEST OF DOG LAKE RD.			L	DIESEL FUEL		UKN	TRANSPORT TRUCK (N.O.S) - DIESEL FUEL TO HWY. FROM SADDLE TANK.	P	Soil contamination	0
9900012271	13-Dec-99	GORHAM TOWNSHIP (UNORGANIZED)	POND ON GORVALE ROAD			WL	DIESEL FUEL		UKN	PRIVATE OWNER: SPILL OF DIESEL FUEL/BATTERY ACID FROM FRONT END LOADER.	C	Multi Media Pollution	0
@	17-Mar-88	THUNDER BAY DISTRICT	BUCCHANAN WOOD LOT,BLOCK 6 60 MI.N.ON GRAHAM RD. & 40 MI.W.LOG.RD.			L	DIESEL FUEL	100-200	L	DITTMAR'S FUELS-TANK LEAKWHILE FILLING--100-200 L TO GROUND.	N		
@	8-Apr-88	THUNDER BAY DISTRICT	MILL SITE HEMLO			L	TAILINGS	UNKNOWN		HEMLO GOLD - TAILING LINE SPILL - MILL SITE			100
@	11-Jun-88	THUNDER BAY DISTRICT	KYRO'S AIRWAYS 5 KM FROM JELLICOE			L	AVIATION FUEL (JET A OR B, TURBO)	5900	L	AERODAT - 5900 L TURBO FUEL B TO GRAVEL RUNWAY.			
@	27-Jun-88	THUNDER BAY DISTRICT	MCKENZIE LAKE 50 14 (LAT) 89 07 (LONG)			W	GASOLINE	5	L	ARMSTRONG AIR AND OUTPOSTSERVICES - 5 L GASOLINE TO MCKENZIE LAKE.			
@	15-Jul-88	THUNDER BAY DISTRICT	1 MI. EAST ON HWY. 11.			L	DIESEL FUEL	400	L	TRANSPORT ACCIDENT - 180-450 LITRES DIESEL FUEL TO DITCH.			
@	17-Aug-88	THUNDER BAY DISTRICT	HWY 11 2KM EAST OF JELLICOE			L	FERRIC CHLORIDE (SOLUTION)	5 - 10	L	5-10 L FERRIC CHLORIDE LEAKED TO HWY FROM EAGLE-BROOK TANKER TRUCK			

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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
@	29-Aug-88	THUNDER BAY DISTRICT	NEAR KLOTZ LAKE, APPROX 50 KM EAST OF LONGLAC			L	SYNTHETIC OIL(S) N.O.S.	820	L	TRANSCANADA PIPELINE- 820 L SYNTHETIC OIL TO LAND			
@	1-Sep-88	THUNDER BAY DISTRICT	HWY 17			L	DIESEL FUEL	UNKNOWN	AMT	BACKENTRY - HYNDMAN TRANSDIESEL FUEL TO DITCH (AMOUNT UNKNOWN)	N		100
@	25-Sep-88	THUNDER BAY DISTRICT	SAGNAGON LAKE ROAD, 14 MILES DOWN ROAD AT BOTTOM OF HILL			L	DIESEL FUEL	UNKNOWN		UNKNOWN AMOUNT OF DIESEL FUEL TO GROUND FROM LEAKYSTORAGE TANK.			
@	1-Nov-88	THUNDER BAY DISTRICT	ON HIGHWAY 17, IN KAMINISTIQWA, 6 MILES WEST OF KAKABEKA			L	GASOLINE	410	L	PETROCANADA-410 L GASOLINE TO GROUND	N		85
@	15-Dec-88	THUNDER BAY DISTRICT	FIRST AVE. WEST, GERALDTON			L	DIESEL FUEL	135	L	TRANSPORT TRUCK			
@	20-Jan-89	THUNDER BAY DISTRICT	LAC DES MILLE LAC NEAR HOOK ISLAND			W	DIESEL FUEL	200	L	CANADA WEST DRILLING - 200 LTR. OF DIESEL FUEL TO WATER.		Water course or lake	90
@	27-Jan-89	THUNDER BAY DISTRICT	TWIN CITY INTERSECTION HWY 1117 AND 130			L	DIESEL FUEL	340	L				
@	8-Feb-89	THUNDER BAY DISTRICT	LOT 3 CORNER CONC. 2 & 3 TWP OF JOYNT			L	DIESEL FUEL	100	L				
@	17-Apr-89	THUNDER BAY DISTRICT	TOTEM TOURIST COURT			L	DIESEL FUEL	UNKNOWN		HEATING OIL TANK-DIESEL FUEL TO GROUND.	P	Groundwater pollution	90
@	23-Apr-89	THUNDER BAY DISTRICT	HWY 17 JUST BEFORE NIPIGON			L	PAINT OR PAINT RELATED N.O.S.	3	L	C.P.EXPRESS TRANS. TRUCK -ENAMEL PAINT TO ROADWAY.			90
@	11-May-89	THUNDER BAY DISTRICT	MNR, MACDAIRMAD SATELLITE BASE			L	GASOLINE	UNKNOWN		MNR MACDAIRMAD SATELLITE BASE- GAS SPILL, TANK TO BE PUMPED OUT.			
@	16-May-89	THUNDER BAY DISTRICT	ANGUS ISLE LIGHTHOUSE, LAKE SUPERIOR			W	DIESEL FUEL	2700	L	2700 L. DIESEL FUEL TO GROUND & LAKE SUPERIOR ATANGUS ISLAND LIGHTHOUSE.	N		95
@	10-Jun-89	THUNDER BAY DISTRICT	CHABAQUA TO SAND IN MTO YARD			L	OILY WATER (N.O.S.)	UNKNOWN		KLEYSEN TRANSPORT WATER BASE OIL TO ROAD & TO SAND AT MTO YARD.	N		0
@	21-Jun-89	THUNDER BAY DISTRICT	IRISH ROVER TRUCK STOP HWY 11 JELLICOE			L	INK			BASF TRANSPORT TRUCK- INK TO SAND PARKING LOT.			
@	25-Jun-89	THUNDER BAY DISTRICT	UMBER LAKE (NEAR TOWN OF ENGLISH RIVER)			W	AVIATION FUEL (JET A OR B, TURBO)	UNKNOWN		CONTENTS OF FUEL TANK FROM CRASHED AIRCRAFT INTO UMBER LAKE.			0
@	5-Jul-89	THUNDER BAY DISTRICT	OBIE CREEK(EAST OF ORIENT BAY) MAIN LINE VALVE 75 + 7.5KM			W	DIESEL FUEL	10	L	TRANSCANADA PIPELINE- 10 L DIESEL FUEL TO OBIE CREEK.			90
@	17-Jul-89	THUNDER BAY DISTRICT	ORIENT BAY, 150 METRES NORTH OF OBEI CREEK (EAST & SOUTH OF ORIENT BAY).			L	DIESEL FUEL	625	L	TRANSCANADA PIPELINE- SPILL OF 625 LTR OF DIESEL TO LAND.			100
@	22-Jul-89	THUNDER BAY DISTRICT	INTERSECTION HWY 11-17 & 587 TEXACO TRUCK STOP NEAR PASS LAKE			L	DIESEL FUEL	MAX 500	L	TRANSPORT TRUCK ACCIDENT DIESEL FUEL TO PAVE PARKING LOT, MAX 300 L.	N		
@	24-Jul-89	THUNDER BAY DISTRICT	HWY. 17 UPPSALA, 100 MILES WEST OF THUNDER BAY			W	PETROLEUM OIL (N.O.S.)	UNKNOWN		MTO T. BAY- REPORT OF OILIN CREEK 20 MILES WEST OFUPPSALA.			
@	24-Jul-89	THUNDER BAY DISTRICT	WHITE LAKE PROVINCIAL PARK			L	SEWAGE (UNTREATED/ RAW)	UNKNOWN	AMT	MNR - WHITE LK PROV PARK SEWAGE HOLDING TANK LEAK SMALL AMT	N		100
8906010384	3-Aug-89	THUNDER BAY DISTRICT	RD. #25 BETWEEN LONGLAC AND GERALDTON			L	HYDRAULIC OIL		UKN	BACKENTRY-HYDRAULIC OIL TO ROAD FROM UNKNOWN VEHICLE.	N		0
8906010383	4-Aug-89	THUNDER BAY DISTRICT	JELLICOE VILLAGE			A	PROPANE	SLIGHT		BACKENTRY-TRADING POST - SLIGHT PROPANE LEAK FROM TANK RELIEF VALVE.	N		0
@	14-Aug-89	THUNDER BAY DISTRICT	70 KM WEST OF ATIKOKAN BESIDE HWY 807			L	PETROLEUM ASPHALT (BITUMEN)	900	L	MILLER PAVING - 900 L OF LIQUID ASPHALT TO GROUND.			
@	20-Sep-89	THUNDER BAY DISTRICT	HWY 11 BETWEEN GERALDTON & LONGLAC			L	DIESEL FUEL	UNKNOWN	AMT	SHERWAY TRANSPORT - TRUCKWITH LEAK IN FUEL LINE SPILLED DIESEL ON HIGHWAY	N		0
@	26-Sep-89	THUNDER BAY DISTRICT	0N HWY. 11 AT VILLAGE OF PEARL 50 KM E. OF THUNDER BAY			L	DIESEL FUEL	400	L	APPROXIMATELY 400 L OF DIESEL FUEL TO ROAD FROM SADDLE TANK ON TRANSPORT.	N	Other	100
@	2-Oct-89	THUNDER BAY DISTRICT	1-2 MILES PAST RAITH DOWN FISH SANCTUARY ROAD FOR 10 KM.			L	DIESEL FUEL	UNKNOWN		VEHICLE FUEL TANK- DIESEL FUEL TO GROUND.			
@	11-Oct-89	THUNDER BAY DISTRICT	11/17 OLIVER ROAD			L	DIESEL FUEL	100	L	BACKENTRY-MOTOR VEHICLE- 100 L DIESEL FUEL TO HWY			
@	8-Nov-89	THUNDER BAY DISTRICT	WILDROSE TRAILER PARK			L	FURNACE OIL	450	L	HEATING OIL TANK-1250 L FURNACE OIL TO GROUND.			95
@	9-Nov-89	THUNDER BAY DISTRICT	MARATHON, TOMBOY PLAZA			L	GASOLINE	20	L	20 L. GASOLINE & VARSOL TO GROUND AND STORM SEWERDURING CLEANING EXERCISE.	N		
@	29-Nov-89	THUNDER BAY DISTRICT	STRATHCONA GOLF COURSE			L	HYDRAULIC OIL	25	L	ONTARIO HYDRO TRUCK- 25 L HYDRAULIC FLUID TO GROUND.			100
8906010852	20-Dec-89	THUNDER BAY DISTRICT	PORT ARTHUR CN YARD			L	MINERAL OIL (LT 50 PPM PCB)	23	L	BACKENTRY - CN RAIL: 23L MINERAL OIL TO GROUND	P	Soil contamination	100
9006010083	5-Feb-90	THUNDER BAY DISTRICT	BLAKE TWP. LOT 9, CONC. 2			L	TRANSFORMER OIL (GT 50 PPM PCB)	1.5	L	ONTARIO HYDRO - 1 1/2 L OF TRANSFORMER OIL (>50 PPM PCB'S) TO LAND.			
9006010087	8-Feb-90	THUNDER BAY DISTRICT	COLLINS - 21.1 TRACK MILES WEST OF ARMSTRONG			L	DIESEL FUEL	5000	L	CNR - 5000 L DIESEL FUEL TO GROUND.	P	Soil contamination	
9006010124	28-Feb-90	THUNDER BAY DISTRICT	HWY #17, 5 MILES WEST OF SUNSHINE			L	DIESEL FUEL	MAX 400	L.	HWY ACCIDENT- MAX 400 L. DIESEL FUEL TO DITCH FROMTRUCK SADDLE TANK.			
9006010150	13-Mar-90	THUNDER BAY DISTRICT	CEDAR CREEK			W	WASTEWATER WITH CYANIDE	600	M3	HEMLO GOLD- SLURRY TO CEDAR CREEK.	P	Fish kill	0
9006010152	13-Mar-90	THUNDER BAY DISTRICT	BEARDMORE, SUMMERS TWP			L	DIESEL FUEL	450	L	CNR-400 L DIESEL TO LAND AFTER COLLISION WITH TRANSPORT TRUCK	P	Soil contamination	0

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9006010154	16-Mar-90	THUNDER BAY DISTRICT	NEAR LAKE SHEBANDOWAN, NORTH SIDE OF ROSSMERE BAY			L	TRANSFORMER OIL (N.O.S.)	9	L	ONTARIO HYDRO -9 L. TRANSFORMER OIL TO GROUND	N	Soil contamination	100
9006010183	30-Mar-90	THUNDER BAY DISTRICT	MTO INSTALLATION AT SMALL AIRPORT AT BEARSKIN LAKE			L	DIESEL FUEL	135	L	AIR CREEBEC - 135 L OF DIESEL FUEL TO GROUND DURING DELIVERY.	N		
9006010185	4-Apr-90	THUNDER BAY DISTRICT	HWY 17 EAST OF MARATHON AT LOOKOUT			L	HYDRAULIC OIL	5	L	BACKENTRY - ONTARIO HYDRO5L HYDRAULIC OIL TO LAND FROM TRUCK	P	Soil contamination	100
9006010303	22-Apr-90	THUNDER BAY DISTRICT	KASHECHEWAN AIRPORT HUDSON BAY			L	FURNACE OIL	675	L	BACKENTRY - KASHECHEWAN AIRPORT: 675 L HEATING OIL TO GROUND FROM TANK	P	Soil contamination	100
9006010308	26-Apr-90	THUNDER BAY DISTRICT	MABELLA TWP.			L	MINERAL OIL (LT 50 PPM PCB)	1	L	BACKENTRY - ONTARIO HYDRO1L MINERAL OIL TO GROUND	P	Soil contamination	100
9006010337	3-May-90	THUNDER BAY DISTRICT	FLORAL BEACH ROAD			L	DIESEL FUEL		UKN	BACKENTRY - FUEL OIL DUMPED ON ROAD. SOURCE ISUNKNOWN.	N		100
9006010425	23-May-90	THUNDER BAY DISTRICT	WALKER LAKE AREA			L	GREY WATER	150	L	CAMPER-150 L GREY WATER TO DITCH.	P	Water course or lake	100
9006010503	8-Jun-90	THUNDER BAY DISTRICT	HWY 17 UPSALA 200 M EAST OF GRAHAM RD.			L	DIESEL FUEL	400	L	400 LTR DIESEL FUEL TO HWY AFTER TWO TRUCKS COLLIDE.	P	Soil contamination	100
9006010566	22-Jun-90	THUNDER BAY DISTRICT	GOLDEN GIANT MINE SITE			L	CRANKCASE OIL	45	L.	BACKENTRY -HEMLO GOLD 45 L. USED MOTOR OIL TO GROUND.	P	Soil contamination	100
9006010648	13-Jul-90	THUNDER BAY DISTRICT	IN GRAHAM, 40 MILES OF TRANSCANADA HWY 1/2 WAY BETWEEN THUNDER BAY AND SOUIX LO			L	DIESEL FUEL	12500	L	CNR-12500 L DIESEL FUEL TO SANDY GROUND	C	Soil contamination	30
@	16-Jul-90	THUNDER BAY DISTRICT	MTO THUNDER BAY HWY 61,NEEBING TWP.			LW	GASOLINE		UKN	BACKENTRY-MTO U/TANK LEAKSMALL QTY OF UNLEADED GASLEAKED INTO GROUND & WELL	N		100
9006010669	18-Jul-90	THUNDER BAY DISTRICT				L	GASOLINE	980	L	SHELL - 980 L GASOLINE TOLAND FROM SPLIT TRAILER OVER LONG DISTANCE.	N		0
@	20-Jul-90	THUNDER BAY DISTRICT	WILLIAMS MINE SITE HEMLO			L	MINERAL OIL (LT 50 PPM PCB)	100	L	BACKENTRY - WILLIAMS OPERATING: MAXIUM 45 L TRANSFORMER OIL TO GROUND	C	Soil contamination	100
@	25-Jul-90	THUNDER BAY DISTRICT	SHEBANDOWAN			W	PETROLEUM OIL (N.O.S.)			MCISSAC EXPLORATIONS: VEGETATION KILLED BY WASTEWATER OVERFLOW	C	Vegetation	
9006010715	31-Jul-90	THUNDER BAY DISTRICT	HEMLO GOLD MINE			L	MILL TAILINGS WITH CYANIDE	300	L	HEMLO GOLD - 3,000 L OF MILL TAILINGS TO GROUND DUE TO OVERFLOW.	P	Soil contamination	0
9060100793	7-Aug-90	THUNDER BAY DISTRICT	MANITOUWADGE			W	SEWAGE (UNTREATED/RAW)		UKN	BACKENTRY-MOE -RAW SEWAGEBYPASS DUE TO PUMP FAILURE.	N		0
9006010790	9-Aug-90	THUNDER BAY DISTRICT	HWY 17 - 9-10 KM SOUTH OF BEARDMORE			L	SULPHUR, MOLTEN	100	KG	LAIDLAW TRANSPORT - UNKNOWN QTY SULFUR TO HWY 17 NEAR BEARDMORE.	N		95
9006010799	13-Aug-90	THUNDER BAY DISTRICT	20 MILES SOUTHEAST OF SUMMER BEAVER AND 25 MILES NORTHWEST OF LANSDOWNE H.			LW	AVIATION FUEL (JET A OR B, TURBO)	1800	L	MNR - 1800 LTR JET FUEL TO SWAMP AREA IN AREA UNACCESSIBLE BY ROAD.	P	Water course or lake	0
@	20-Aug-90	THUNDER BAY DISTRICT	EAST LOON ROAD			LW	DIESEL FUEL		UKN	ARNOLD BROS.TRANS-SPILL OF DIESEL FUEL TO DITCH FROM SADDLE TANK.	P	Soil contamination	
9006010846	22-Aug-90	THUNDER BAY DISTRICT	HOUGH/MATTAWIN RD - 7.5 KM EAST OF SWALLOW LAKE AIRSTRIP			L	VISION, ROUNDUP, GLYPHOSATE	800	L	CP FOREST PRODUCTS: 800 LPESTICIDE TO GRAVEL AFTERTRUCK OVERTURNED	N	Soil contamination	
@	25-Aug-90	THUNDER BAY DISTRICT	HWY #11/17 EAST OF THUNDER BAY AT NELSON ROAD			L	WASTE SLURRY	20	T	TRUCK TIPPED OVER - 20 TON OF IRON ORE SLURRY TO DITCH.	P	Water course or lake	100
@	27-Aug-90	THUNDER BAY DISTRICT	COMPRESSOR BLDG.			L	COOLING WATER	1000	L	BACKENTRY- MCISSAC MINES:1,000 L COOLING WATER TO GROUND.	N		75
@	29-Aug-90	THUNDER BAY DISTRICT	SHEBANDOWAN INCO MINE			L	FURNACE OIL		UKN	BACKENTRY - INCO: HEATINGFUELSPILLED TO BERMED AREA FROM LEAKING TANK	P	Soil contamination	100
@	10-Sep-90	THUNDER BAY DISTRICT	PUKASWA AIRSTRIP NEAR ROAD 600			L	VISION, ROUNDUP, GLYPHOSATE	139	L	BACKENTRY - SUPER MARINE:139 L HERBICIDE TO GROUNDFROM AIRCRAFT	P	Vegetation	0
@	26-Sep-90	THUNDER BAY DISTRICT	PAYS PLAT RESERVE			L	GASOLINE		UKN	BACKENTRY - PRIVATE HOME:GASOLINE SPILLED WHILE REFUELING CHAINSAW	C	Soil contamination	
@	2-Oct-90	THUNDER BAY DISTRICT	AT RESORT ON BLIND BAY RD. IN UPSALA			L	DIESEL FUEL	4,500	L	4,500 L OF DIESEL FUEL TOGROUND FROM LINE LEADING TO FUEL TANK.	C	Soil contamination	90
9060101077	22-Oct-90	THUNDER BAY DISTRICT	UPSALA ESSO STN.			L	BATTERY ACID (SULFURIC ACID)	20	L	FIRE IN TRUCK MELTED 20 OLD CAR BATTERIES. ACID RAN OUT BACK OF TRUCK.	N		0
9006011094	25-Oct-90	THUNDER BAY DISTRICT	PRIVATE RESIDENCE AT CORNER OF HWY. 588 & HWY. 590, ACROSS FROM ESSO STATION			L	FURNACE OIL	200	L	200 L OF FURNACE OIL DUMPED ON RESIDENT'S PROPERTY NEAR WELL.	P	Groundwater pollution	100
@	30-Oct-90	THUNDER BAY DISTRICT	DAWSON TRAILS CAMPGROUND QUETICO PROVINCIAL PARK			L	GASOLINE		UKN	BACKENTRY - MNR: GASOLINELEAKED FROM STORAGE TANK AND CONTAMINATED SOIL	C	Soil contamination	100
@	31-Oct-90	THUNDER BAY DISTRICT	BAWK, GOULET UNORG. TWP BETWEEN LONGLAC & NAKINA			A	PROPANE		UKN	CNR - PROPANE LEAKING FROM TANK CAR RELIEF VALVE IN ISOLATED AREA.	N		
@	20-Nov-90	THUNDER BAY DISTRICT	HWY 17, 35M WEST OF MARATHON			L	DIESEL FUEL	20	L	TRANSPORT TRUCK:20L DIESEL FUEL TO GROUND.	C	Soil contamination	0
@	17-Dec-90	THUNDER BAY DISTRICT	MTO YARD, HWY 17, UPSALA			L	SEWAGE,RAW UNCHLORINATED		UKN	BACKENTRY: SEWAGE TO GROUND FROM SEPTIC FIELD.	P	Soil contamination	0
@	23-Dec-90	THUNDER BAY DISTRICT	HWY 17, 0.5KM WEST OF STEELE RIVER BRIDGE.			L	DIESEL FUEL	50	L	SCOTT WINSTON TRANSPORT: 50L DIESEL TO DITCH.	P	Soil contamination	98
@	7-Feb-91	THUNDER BAY DISTRICT	HIGHWAY 11 & 17			L	NICKEL COPPER CONCENTRATE (SLURRY)	404	KG	BACKENTRY: INCO - 404 KG COPPER-NICKEL CONCENTRATELOST ALONG HIGHWAY.	P	Soil contamination	0
@	25-Feb-91	THUNDER BAY DISTRICT	9 KM. WEST OF KENOGAMIE R. BETWEEN LONGLAC AND GERALDTON (13.2 KM)			L	HYDRAULIC OIL	10	L	TRANS CANADA PIPELINES - 10 L. HYDRAULIC OIL TO GROUND.	N		100

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@	4-Mar-91	THUNDER BAY DISTRICT	RAITH, CP-RAIL MILE 53, SUB STN.			L	FURNACE OIL	987	L	ESSO -987 L. OIL TO GR'D,WHEN ABANDONED TANK FILLED AT CP-RAIL YARD.	P	Groundwater pollution	100
@	12-Mar-91	THUNDER BAY DISTRICT	SHABAQUA CORNERS (GRAVEL SHOULDER OF ROAD IN FRONT OF OPP STATION)			L	DIESEL FUEL	45	L	VEHICLE ACCIDENT - 45 L DIESEL FROM SADDLE TANK TO ROAD SHOULDER.	P	Soil contamination	50
@	13-Mar-91	THUNDER BAY DISTRICT	MAINLINE # 71+11.45 20 KM EAST OF 527			L	HYDRAULIC OIL	25	L	TRANSCANADA PIPELINES VEHICLE-25 L HYDRAULIC OIL TO GROUND.	P	Soil contamination	100
@	15-Mar-91	THUNDER BAY DISTRICT	MILE MARKER 25 CATLONITE ROAD			L	DIESEL FUEL	5	L	KIMBERLY-CLARK TRUCK- 5 L DIESEL FROM SADDLE TANK TO LONGLAC.	P	Water course or lake	0
@	1-Apr-91	THUNDER BAY DISTRICT	ON EASTBOUND LANE OF HWY. 11 1 MILE WEST OF SUCKLE LAKE			L	DIESEL FUEL	150	L	150 L OF DIESEL TO HWY. FROM RUPTURED SADDLE TANKON TRANSPORT TRUCK.	N		99
@	5-Apr-91	THUNDER BAY DISTRICT	WHITESAND RIVER			W	MINE WATER (HEAVY METALS N.O.S.)		UKN	MINNOVA-UNKNOWN QUANTITY OF RECLAIM WATER TO WHITESAND RIVER	P	Water course or lake	
@	6-Apr-91	THUNDER BAY DISTRICT	WHITESAND RIVER			W	PARTIALLY TREATED MINE WATER		UKN	BACKENTRY-MINOVA WINSTON -RECLAIMED WATER TO WHITESAND RIVER.	P	Water course or lake	0
@	23-Apr-91	THUNDER BAY DISTRICT	ABITIBI BLOCK 3, KM 5 DOG RIVER ROAD			L	CRANKCASE OIL	18	L	18 L CRANKCASE OIL DUMPEDFROM FORESTRY SKIDDER TO GROUND.	P	Soil contamination	
@	23-Apr-91	THUNDER BAY DISTRICT	ROUSE LAKE			LW	DIESEL FUEL	20	L	TRANSPORT TRUCK CAUGHT FIRE-DIESEL FUEL TO WATERFILLED DITCH	N	Water course or lake	100
@	11-Jun-91	THUNDER BAY DISTRICT	DOG LAKE RD., SURPRISE LAKE AREA			L	DIESEL FUEL	360	L	BACKENTRY-POULIN CONST. 360 L. DIESEL FUEL TO DOG LAKE ROAD.	N		90
@	14-Jun-91	THUNDER BAY DISTRICT	SHABAQUA			L	DIESEL FUEL	100	L	PRIVATE CONTRACTOR - 100 L DIESEL FUEL TO LOGGING ROAD FROM PORTABLE TANK.	P	Soil contamination	0
@	20-Jun-91	THUNDER BAY DISTRICT	FLATROCK ROAD			L	WASTE OIL	10	L	BACKENTRY: C.P.F.P. - U/KQTY WASTE OIL TO GROUND FROM LOG-SKIDDER.	P	Soil contamination	0
@	20-Jun-91	THUNDER BAY DISTRICT	END OF FLATROCK RD., NORTH OF AOC # 635			L	MOTOR OIL		UK	BACKENTRY-CDN PACIFIC F.P -USED MOTOR OIL TO GROUND.	C	Soil contamination	0
@	27-Jun-91	THUNDER BAY DISTRICT				L	WASTE WATER	0.8	M3	HEMLO GOLD MINES -0.8 M3 TAILINGS WATER TO GROUND.	C	Soil contamination	0
@	2-Jul-91	THUNDER BAY DISTRICT	ON HWY. 17 EAST OF PIC RIVER BRIDGE			L	PETROLEUM DISTILLATE	10	L	SHELL - UNKNOWN AMOUNT OFDISTILLATE TO HWY. FROM TANK TRUCK.	C	Soil contamination	99
@	3-Jul-91	THUNDER BAY DISTRICT	BRIGHT SANDS ROAD UPSALA			L	DIESEL FUEL	4.5	M3	C.P.FOREST PROD-4500 L. DIESEL FUEL TO ROADWAY, MOVING TANK RUPTURED	P	Soil contamination	100
@	12-Jul-91	THUNDER BAY DISTRICT	OLIVER ROAD MARILLOW			L	GASOLINE	600	L	MARILLOW GAS BAR-600 L GASOLINE TO GROUND.	C	Soil contamination	50
@	25-Jul-91	THUNDER BAY DISTRICT	HWY 61 KAM RIVER BRIDGE			L	PETROLEUM OIL (N.O.S.)		UKN	PETROLEUM ON HWY 61.	N		0
@	26-Aug-91	THUNDER BAY DISTRICT	ON HWY. 527 20 MILES NORTH OF THUNDER BAY			L	DIESEL FUEL	100	L	100 L OF DIESEL FUEL TO HIGHWAY FROM SADDLE TANKSON TRANSPORT.	C	Soil contamination	99
@	4-Sep-91	THUNDER BAY DISTRICT	HWY 527 OPPOSITE NEW WEIGH SCALES			L	HYDRAULIC OIL	45	L	ONTARIO HYDRO - 45 L. OF HYDRAULIC FLUID TO GROUND FROM BROKEN HOSE	N		100
@	6-Sep-91	THUNDER BAY DISTRICT	HWY 11 NORTH OF 17 MCDERMID			L	DIESEL FUEL	400	L	BURNS TRANSPORT - APPROX. 400 L. OF DIESEL TO SHOULDER HWY 11	P	Soil contamination	90
@	13-Sep-91	THUNDER BAY DISTRICT	HWY 130 AT ROSSALYNN RD.			L	POTASH (POTASSIUM CHLORIDE)	114	KG	PRIVATE TRUCK -250 LBS. POTASH TO ROAD.	N		99
@	13-Sep-91	THUNDER BAY DISTRICT	TAILINGS EMPOUNDMENT			L	TAILINGS		UK	HEMLO GOLD -TAILINGS LINEBREAK, TAILINGS TO DITCH;CONTAINED.	N		100
@	1-Oct-91	THUNDER BAY DISTRICT	10 KM WEST OF NIPIGON BETWEEN TCPL VALVES 72 AND 73			L	FUEL OIL	15	L	TRANSCANADA PIPELINES: 15 L FUEL OIL TO GROUND FROM HOSE ON STORAGE TANK	C	Soil contamination	100
@	3-Oct-91	THUNDER BAY DISTRICT	BUSH CAMP #53 - 45 KM SOUTH OF LONGLAC ON CONCORD BUSH ROAD			L	DIESEL FUEL	4000	L	KIMBERLY-CLARK: 4 000 L DIESEL FUEL SPILLED TO GROUND AT BUSH CAMP	P	Soil contamination	0
@	21-Oct-91	THUNDER BAY DISTRICT	LEGAULT TWP.			L	DIESEL FUEL	48	L	TRANSCANADA PIPELINES: DIESEL, MOTOR & HYDRAULIC FLUID LEAKS	P	Water course or lake	90
@	21-Oct-91	THUNDER BAY DISTRICT	RAITCH STATION/HWY#17 GOLDING TWP			L	SEWAGE (TREATED)	50	L	PRIVATE OWNER-50L SEWAGE ONTO DITCH FROM MOTOR HOME SEPTIC TANK.	P	Soil contamination	0
@	4-Nov-91	THUNDER BAY DISTRICT				LW	SLUDGE (N.O.S.)		UKN	WILLIAMS OPERATING CORP- SLUDGE TO GRND & POND, NO QTY.LINE FROZEN.	N	Other	
@	8-Nov-91	THUNDER BAY DISTRICT	KASHABOWIE SUBDIVISION			L	DIESEL FUEL	1200	L	CN RAIL - 1200 L. OF DIESEL FUEL TO TRACKS FROM DERAILED ENGINE	P	Soil contamination	0
@	15-Nov-91	THUNDER BAY DISTRICT	EAGLEHEAD (50 MILES NORTH OF THUNDER BAY)			L	ETHYLENE GLYCOL (ANTIFREEZE)	113	L	TRANSCANADA PIPELINE: 225L WATER/GLYCOL MIXTURE TOGRND FROM RUPTURED LINE.	P	Soil contamination	100
@	28-Nov-91	THUNDER BAY DISTRICT				L	MINE WATER (HEAVY METALS N.O.S.)	5000	L	HEMLO GOLD: 5 M3 RECLAIM WATER OVERFLOWED FROM THECLARIFIER TO THE GROUND.	N		90
@	14-Dec-91	THUNDER BAY DISTRICT	POLLY LAKE, 18 KM NORTH OF JCTN OF HWYS. 11 &17.			L	FUEL OIL	450	L	PRIVATE RESIDENCE -450L. FUEL OIL TO GROUND DUE TOVANDALISM TO FUEL TANK.	C	Soil Contamination	99
@	16-Dec-91	THUNDER BAY DISTRICT	PHILLIPS CREEK RD, MILE 4, 13MILES OFF BOUND LAKE RD. HILLSPORT			L	DIESEL FUEL	30	L	HUSKY-30L DIESEL FUEL TO GROUND, TANKER TRUCK ROLLED OVER, CLEANED UP.	P	Soil Contamination	99

Table H-4
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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
@	13-Jan-92	THUNDER BAY DISTRICT	KLOTZ LAKE AREA			L	HYDRAULIC OIL	3	L	SPYE CONTRACTORS: 3L HYDRAULIC OIL LEAK FROM CATERPILLAR HOSE	N		100
@	14-Jan-92	THUNDER BAY DISTRICT	BUSH CAMP 20 MI. N.E. OF LONGLAC			L	DIESEL FUEL	900	L	KIMBERLY-CLARK - 900 L DIESEL FUEL SPILLED TO GROUND AT BUSH CAMP.	P	Soil Contamination	99
@	15-Jan-92	THUNDER BAY DISTRICT	GOLDEN GIANT MINE			L	RECIRCULATION WATER	100	M3	HEMLO: 100 M3 RECLAIM H2OFROM TAILINGS PIPE TO GROUND.	N	Soil Contamination	0
@	19-Jan-92	THUNDER BAY DISTRICT				L	TAILINGS RUN OFF WATER	300	M3	HEMLO GOLD- 300 M3 OF RECYCLE WATER TO DITCH FROM TAILINGS POND.	P	Soil Contamination	85
@	25-Jan-92	THUNDER BAY DISTRICT	33.2 KM EAST OF LONGLAC			L	HYDRAULIC OIL	68	L	TRANSCANADA PIPELINES: 68 L HYDRAULIC OIL FROM BROKEN HOSE TO GROUND.	C	Soil Contamination	80
@	3-Feb-92	THUNDER BAY DISTRICT	49 KM EAST OF LONGLAC 200 M EAST OF COMPRESSOR STATION #84			L	MOTOR OIL	16	L	TRANSCANADA PIPELINES: 16 L MOTOR OIL TO GROUND WHILE CHANGING OIL FILTER	C	Multi-media Pollution	100
@	3-Feb-92	THUNDER BAY DISTRICT	60 KM EAST OF LONGLAC CUTTING CAMP #31			L	DIESEL FUEL	675	L	KIMBERLY-CLARK: 3 600 L DIESEL FUEL TO GROUND WHEN SKIDDER BROKE HOSE	C	Other	0
@	12-Feb-92	THUNDER BAY DISTRICT	HWY #585 ON CAMERON FALLS RD			L	DIESEL FUEL	10	L	ONTARIO HYDRO -10L DIESEL& 2L HYDRAULIC OIL TO GROUND FROM TRACTOR.	N		98
@	2-Mar-92	THUNDER BAY DISTRICT	3RD CONCESSION WARE TWP.			L	HYDRAULIC OIL	113	L	NORTHWEST VEGETATION CONTROL - 113 L HYDRAULICOIL TO SNOW/GROUND.	P	Soil Contamination	75
@	6-Mar-92	THUNDER BAY DISTRICT	HWY 17 AT DEAD HORSE CREEK WALSH TP (GEO)			L	DIESEL FUEL	200	L	200 L DIESEL FUEL TO HWY,ICY CONDITION RESULTING IN TRUCK JACKNIFE.	C	Surface Water Pollution	50
@	18-Mar-92	THUNDER BAY DISTRICT	BUSH CAMP #32, 30 MI. N.E. OF NAKINA			L	DIESEL FUEL	450	L	KIMBERLY-CLARK - 450 L OF DIESEL FUEL TO GROUND FROM TANK AT BUSH CAMP.	N	Other	90
@	2-Apr-92	THUNDER BAY DISTRICT	IN UPSULA AT THE SHELL STATION WHICH IS ALSO A BUS STATION			L	DIESEL FUEL	45	L	DRYDEN BUSLINES - 45 L OF DIESEL FUEL TO PAVEMENT FROM BUS.	C	Soil Contamination	100
@	9-Apr-92	THUNDER BAY DISTRICT	HWY 11 1 MILE WEST OF SUCKLE LAKE			L	DIESEL FUEL	450	L	TRANSPORT TRUCK: 450L DIESEL FUEL SLICK ALONG HWY. HOLE IN SADDLE TANK	P	Soil Contamination	80
@	9-Apr-92	THUNDER BAY DISTRICT	DAVID BELL MINE (HEMLO)			L	CEMENT	450	KG	DAVID BELL MINE -450 KG. SLAG CEMENT TO GROUND, CLEANING UP.	N		99
@	3-May-92	THUNDER BAY DISTRICT				W	WASTEWATER WITH CYANIDE	300	M3	WILLIAMS MINE - 300 M3 RECLAIM H2O (<2 PPM CYA- NIDE) TO LIM LAKE SYSTEM.	P	Surface Water Pollution	0
@	7-May-92	THUNDER BAY DISTRICT	BLACK STURGEON RD (20 KM NORTH OF HWY 17)			L	DIESEL FUEL	300	L	C.P. FOREST PRODUCTS: 300L DIESEL FUEL LEAK DURING FILLUP, PIPE SPLIT	C	Soil Contamination	90
@	28-May-92	THUNDER BAY DISTRICT				L	OILY WATER (N.O.S.)	200	L	WILLIAM OPERATING CORP. -200 L. HEATING OIL TO GROUND.	C	Soil Contamination	0
@	3-Jul-92	THUNDER BAY DISTRICT				W	DIESEL FUEL	45	L	PETRO-CANADA - 45 L OF DIESEL FUEL SPILLED TO DYKED AREA	N		99
@	14-Jul-92	THUNDER BAY DISTRICT				L	SEWAGE (UNTREATED/RAW)	10	M3	WILLIAMS MINE - SEWAGE SPILLED TO GROUND FROM BUILDING	P	Other	0
@	17-Jul-92	THUNDER BAY DISTRICT	WILLIAMS MINE			L	WASTEWATER WITH CYANIDE	12000	L	WILLIAMS OPERATING CORP.:CYANIDE SOLUTION TO LAND DUE TO PUMP FAILURE	P	Soil contamination	0
@	19-Jul-92	THUNDER BAY DISTRICT				L	PROCESS WATER (NOT OTHERWISE SPECIFIED)	38	M3	WILLIAMS MINE SITE- 38 M3PROCESS WATER (CYANIDE & SOME METALS) TO GROUND.	C	Soil contamination	100
@	20-Jul-92	THUNDER BAY DISTRICT	SCOBLE TWP. (OFF 6TH CONCESSION)			L	TRANSFORMER OIL (N.O.S.)	60	L	ONT.HYDRO- LIGHTNING STRUCK TRANSFORMER;LEAKED60L TRANSF. OIL TO AREA.	P	Soil Contamination	0
@	24-Jul-92	THUNDER BAY DISTRICT	LOT 24, PAIPOONIGE TWP. TRANSFORMER LOC. 2043			L	TRANSFORMER OIL (N.O.S.)	4	L	ONTARIO HYDRO: 4 L TRANSFORMER OIL TO GROUNDOVER LONG TIME PERIOD	C	Soil contamination	99
@	31-Jul-92	THUNDER BAY DISTRICT	75 KM EAST OF LONGLAC NEAR PIPELINE			L	DIESEL FUEL	135	L	TRANSCANADA PIPELINES - 135 L OF DIESEL FUEL TO GROUND FROM TRUCK.	C	Soil Contamination	100
@	1-Aug-92	THUNDER BAY DISTRICT				L	GRINDING WATER	180	L	WILLIAMS OPERATING CORP.:SUMP WATER TO GROUND	P	Soil contamination	0
@	1-Aug-92	THUNDER BAY DISTRICT	LEDUC TWP 6 KM EAST OF JELLICO TOWN			L	DIESEL FUEL	25	L	TRANSCANADA PIPELINES: 35 L OPERATING FUEL TO GRND FROM DRILL.	C	Soil contamination	99
@	4-Aug-92	THUNDER BAY DISTRICT	GRAHAM RD. AT HWY 17 UPSALA			L	DIESEL FUEL	300	L	BUCHANNON FOREST PRODUCTS-300 L OF DIESEL FUEL ON GROUND	C	Soil contamination	75
@	10-Aug-92	THUNDER BAY DISTRICT	HWY 17, EAST OF MARATHON			L	USED MOTOR OIL	15	L	WILLIAMS OPERATING CORP. -15 L. USED MOTOR TO GRD., CONTAINED, CLEANED UP.	C	Soil contamination	99
@	11-Aug-92	THUNDER BAY DISTRICT	80 KM EAST OF LONGLAC			L	DIESEL FUEL	70	L	MACHETE PIPE STRINGING: 70 L DIESEL FUEL TO LAND	C	Soil contamination	100
@	13-Aug-92	THUNDER BAY DISTRICT	HWY 1117 AT HWY 587, WEST BOUND			L	COPPER SULFATE		UK	TRANSPORT TRUCK -BAGS OF COPPER SULPHATE TO HWY., 2-3 BROKEN OPEN.	N		90
@	18-Aug-92	THUNDER BAY DISTRICT	HWY 17, MCTAVISH NEAR SILVER LAKE RD			L	DIESEL FUEL	135	L	GARY STEEL HAULAGE: 500 LDIESEL FUEL TO DITCH FROMRUPTURED SADDLE TANK.	C	Soil contamination	90
@	18-Aug-92	THUNDER BAY DISTRICT				L	ORE SLURRY	13	L	WILLIAMS OPERATING CORP.-13L LEACH SLURRY ONTO GRAVEL. CLEANED UP.	C	Soil contamination	95
@	20-Aug-92	THUNDER BAY DISTRICT	GOLDEN GIANT MINE			L	LIME SLURRY/SLUDGE	700	L	HEMLO - 700 L OF LIME SLURRY TO GROUND.	P	Soil contamination	
@	17-Sep-92	THUNDER BAY DISTRICT	IN JELLICOE AT VALVE STATION 77			L	HYDRAULIC OIL		UKN	TRANSCANADA PIPELINES - HYDRAULIC FLUID TO GROUND, SOURCE UNKNOWN.	N		100
@	20-Sep-92	THUNDER BAY DISTRICT	WILLAIMS MINE SITE HEMLO			L	CALCIUM HYDROXIDE (HYDRATED LIME)	4	M3	WILLIAMS MINE SITE-4 M3 HYDRATED LIME TO GRND, CONTAINED,RE-USED.	N		95

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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
@	2-Nov-92	THUNDER BAY DISTRICT	ON HWY. 11/17 ABOUT 15 MI. E. OF THUNDER BAY			L	DIESEL FUEL		UKN	TRANSPORT TRUCK - UNKNOWNAMOUNT OF DIESEL FUEL TO HWY. FROM TRANSPORT TRUCK	N	Other	100
@	11-Nov-92	THUNDER BAY DISTRICT	HEMLO MINE SITE			L	WATER/SEDIMENT		UKN	WILLIAMS MINE - WATER FROM THE SEDIMENT POND TO GROUND	P	Soil contamination	0
@	19-Nov-92	THUNDER BAY DISTRICT	VICINITY OF PARTRIDGE LAKE LEGAULT TWP			W	GASOLINE	45	L	PRIVATE: GASOLINE SEEPED INTO LAKE DUE TO JEEP DRIVEN INTO LAKE.	P	Water course or lake	0
@	1-Dec-92	THUNDER BAY DISTRICT	HWY 17 25 MI. WEST OF MARATHON			LW	DIESEL FUEL	450	L	TRANSPORT TRUCK - 450 L OF DIESEL FUEL TO DITCH AND CREEK FROM TANKS	P	Multi Media Pollution	0
@	7-Dec-92	THUNDER BAY DISTRICT	STEDMAN TWP			L	MOTOR OIL	4	L	TRANSCANADA PIPELINES - 4 L OF MOTOR OIL TO GROUND	N		90
@	11-Dec-92	THUNDER BAY DISTRICT	CUTTING CAMP ABOUT 20 MILES NORTH OF LONGLAC			L	DIESEL FUEL	550	L	KIMBERLY-CLARK - 550 L OFDIESEL FUEL TO GROUND FROM HOSE ON TANK.	P	Soil contamination	0
9300000457	15-Jan-93	THUNDER BAY DISTRICT	WABA EXTENSION, NORTH OF NAKINA CAMP 32			L	DIESEL FUEL			KIMBERLY-CLARK: FUEL LEAK FROM STORAGE TANK ATBUSH CAMP	C	Soil contamination	0
9300001333	12-Feb-93	THUNDER BAY DISTRICT				L	SEWAGE (UNTREATED/RAW)	100	L	HEMLO GOLD MINE - 100 L OF RAW SEWAGE TO GROUND	N		90
9300001463	17-Feb-93	THUNDER BAY DISTRICT	KAKABEKA RIVER			W	LUBRICATING OIL/GREASE	10	L	ONTARIO HYDRO-10 LITERS LUB OIL TO KAKABEKA RIVER,HOSE FAILED IN PLANT.	P	Water course or lake	0
9300001671	24-Feb-93	THUNDER BAY DISTRICT	HIGHWAY 17 EAST OF MARATHON			L	FUEL OIL	10	L	MIKUS FUELS: FUEL OIL LEAKING FROM VALVE ON TRUCK	N		50
9300001681	24-Feb-93	THUNDER BAY DISTRICT	SECTION 18, CONC B, COMPRESSOR STN #68 MACGREGOR TWP			L	ETHYLENE GLYCOL (ANTIFREEZE)	450	L	TRANSCANADA PIPELINES- 450L GLYCOL/WATER MIX TO SNOW,TANK VALVE LEFT OPEN	C	Soil contamination	99
9300002069	8-Mar-93	THUNDER BAY DISTRICT	AT THE HEMLO GOLD MINE 40 KM EAST OF MARATHON			L	FLY ASH		UKN	HEMLO - UNKNOWN AMOUNT OF FLY ASH TO GROUND FROM TRUCK.	N	Other	100
9300002079	9-Mar-93	THUNDER BAY DISTRICT				L	LUBRICATING OIL/GREASE	1100	L	HEMLO GOLD-1100 L LUBE OIL TO GROUND, CONTAINED.	P	Soil contamination	90
9300002254	14-Mar-93	THUNDER BAY DISTRICT	HIGHWAY 17 8 KM WEST OF MARATHON			L	WAX, LIQUID	50	L	QUICK-X TRANSPORTATION: WAX SPILLED INSIDE TRUCK AND ON ROAD	N		100
9300002662	25-Mar-93	THUNDER BAY DISTRICT	HWY 17 BETWEEN RAITH & UPSALA			LW	PHOSPHORIC ACID	25	L	CP EXPRESS & TRANSPORT: TRACTOR OVERTURN ON HWY 17. MINOR CHEMICAL LEAK	P	Soil contamination	99
9300003011	2-Apr-93	THUNDER BAY DISTRICT				L	USED MOTOR OIL	8	L	WILLIAMS MINE-8 LITERS USED MOTOR OIL TO GROUND,CONTAINED & CLEANED-UP.	N		99
9300003312	9-Apr-93	THUNDER BAY DISTRICT	WILLIAMS MINE			L	HYDRAULIC OIL	15	L	HEMLO GOLD: 10-15 L HYDRAULIC OIL TO LAND DUETO BROKEN HOSE ON LOADER.	P	Soil contamination	25
9300003361	10-Apr-93	THUNDER BAY DISTRICT				L	TAILINGS	40000	L	HEMLO GOLD: 40,000 L TAILINGS SLURRY TO GROUNDDUE TO PUMP FAILURE.	P	Soil contamination	0
9300003515	12-Apr-93	THUNDER BAY DISTRICT	GOLDEN GIANT MINE			L	TREATED EFFLUENT (N.O.S.)	30	L	HEMLO - 30 LITRES OF TREATED EFFLUENT TO LAND FROM CONTAINMENT SYSTEM.	P	Soil contamination	0
9300004206	28-Apr-93	THUNDER BAY DISTRICT	HWY 11, 60 KM EAST OF LONGLAC			L	DIESEL FUEL	60	L	STYX INTERNATIONAL-TRUCK 60 L OF DIESEL TO DITCH ON HWY 11	P	Soil contamination	90
9300004324	30-Apr-93	THUNDER BAY DISTRICT	80 KM NORTH OF MANITOUWADGE			L	WASTE OIL	50	L	CONTRACTOR: 50 L WASTE OIL DUMPED ON GROUND BY BULLDOZER DRIVER.	P	Water course or lake	0
9300004543	4-May-93	THUNDER BAY DISTRICT	KOWKASH AT MILE 155 ON CN RAIL BETWEEN NAKINA,MILE 131 AND ARMSTRONG,MILE 243.			LW	DIESEL FUEL	3600	L	CN RAIL-3600 L DIESELFUELTO SWAMPY AREA FROM TANK CAR LEAK.	P	Water course or lake	75
9300004584	5-May-93	THUNDER BAY DISTRICT	HEMLO MINE SITE			L	PETROLEUM OIL (N.O.S.)	5	L	WILLIAMS OPERATING CORP.:POSSIBLE SPILL OF OIL ANDANTIFREEZE TO THE GROUND	C	Soil contamination	100
9300004702	7-May-93	THUNDER BAY DISTRICT	RAILWAY SIDING AT EXTON 20 KM WEST OF NAKINA			L	OILY MATERIAL N.O.S.	30	L	KIMBERLY-CLARK- 30 L OIL TO GROUND AT EXTON SIDING	C	Soil contamination	90
9300004890	11-May-93	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	90	L	WILLIAMS OPERATING CORP: 90L HYDRAULIC OIL LEAK FROM TRUCK TO GROUND	C	Soil contamination	95
9300005679	28-May-93	THUNDER BAY DISTRICT				L	WASTE OIL	650	L	WILLIAMS OPERATING CORP.-650 L OF WASTE OIL TO GROUND	C	Soil contamination	50
9300005796	31-May-93	THUNDER BAY DISTRICT	HIGHWAY 11, 30 MILES NORTH OF NIPIGON BOTTOM OF ORIENT BAY HILL			L	DIESEL FUEL		UKN	LAIDLAW - UNK QTY DIESEL FUEL FROM FUEL TANKS TO DITCH: TRUCK ROLLOVER.	C	Soil contamination	99
9300005898	2-Jun-93	THUNDER BAY DISTRICT	AT COLD STORAGE AREA OF HEMLO MINES			L	HYDRAULIC OIL	20	L	HEMLO GOLD - 20 L OF HYDRAULIC OIL TO GROUND FROM KNOCKED OVER PAIL.	N	Other	100
9300006223	9-Jun-93	THUNDER BAY DISTRICT	AEROLAND			L	DIESEL FUEL	45	L	AEROLAND-45L DIESEL FUEL TO LAND FROM STORAGE TANKTIPPED WHILE REFILLING.	N		0
9300006831	21-Jun-93	THUNDER BAY DISTRICT	AT WILLIAMS MINE AT THE PIT GARAGE			L	TRANSMISSION OIL	135	L	WILLIAM OPERATING CORP. - 135 L OF TRANSMISSION FLUID TO LAND FROM DRILL.	N	Other	100
9300007694	9-Jul-93	THUNDER BAY DISTRICT	HWY 17, EAST OF MARATHON			L	TAILINGS	225	L	WILLIAMS OPERATING CORP. -225 L OF TAILINGS TO GROUND.	N	Other	100
9300008591	29-Jul-93	THUNDER BAY DISTRICT				L	SLURRY (N.O.S.)	135	L	WILLIAMS MINE: 135 L SLURRY TO SOIL.	N	Soil contamination	90
9300008637	30-Jul-93	THUNDER BAY DISTRICT	HEMLO			L	HYDRAULIC OIL	90	L	WILLIAMS MINE - 90 L OF HYDRAULIC OIL TO GROUND	P	Soil contamination	0

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9300008683	31-Jul-93	THUNDER BAY DISTRICT	TRANSCANADA(HWY #11(17), 6 KM WEST OF JUNCTION OF HWY #102 & 11(17), SHABAQUA			LW	DIESEL FUEL	100	L	ATLAS VANLINES -TRUCK HITBRIDGE & IS ON FIRE, 98L DIESEL TO HWY,2L TO CREEK	C	Soil contamination	98
9300008928	6-Aug-93	THUNDER BAY DISTRICT				L	PROCESS WATER (NOT OTHERWISE SPECIFIED)	400	L	WILLIAMS MINE-400L OILY PROCESS WATER TO GROUND, ABSORBANT APPLIED.	N		85
9300009192	13-Aug-93	THUNDER BAY DISTRICT	HWY 17 PASS LAKE TOWN			L	TOLUENE SULPHONIC ACID (<5%) LIQUID	30	L	TRANSX LTD: 30L TOLUENE SULPHONIC ACID TO HWY 17 & PARKING LOT.	N		0
9300009202	13-Aug-93	THUNDER BAY DISTRICT	EAST OF IGNACE 5 MILES NORTH ON BREEZY POINT ROAD			L	HYDRAULIC OIL	450	L	CPFP: 450 L OIL & FUEL TO LAND FROM CHIPPER ENGINE	C	Soil contamination	100
9300009721	23-Aug-93	THUNDER BAY DISTRICT	HIGHWAY 11, 25 MILES EAST OF NIPIGON			L	DIESEL FUEL		UKN	CP EXPRESS & TRANSPORT - UNK QTY DIESEL FUEL TO LAND FROM FUEL TANK	P	Soil contamination	99
9300010298	3-Sep-93	THUNDER BAY DISTRICT	48 KM NORTH OF HWY 11 AUDEN FOREST MANAGEMENT AREA			L	DIESEL FUEL	450	L	ABOVEGROUND FUEL TANK - 450 L OF DIESEL FUEL TO GROUND	C	Soil contamination	50
9300010686	14-Sep-93	THUNDER BAY DISTRICT	CAMP 64,5 MILE ON STOCKPILE RD MILE 16 ON CRIB ROAD.			L	DIESEL FUEL	5.2	M3	KIMBERLY CLARK-5.2 M3 DIESEL FUEL TO GROUND, CONTAINED,VALVE LEFT OPEN	P	Soil contamination	98
9300010925	20-Sep-93	THUNDER BAY DISTRICT	GOLDEN GIANT MINE			L	TAILINGS	100	L	HEMLO - 100 L OF TAILINGSSLURRY TO GROUND FROM RUPTURED LINE IN MILL.	C	Soil contamination	0
9300011659	8-Oct-93	THUNDER BAY DISTRICT	MILE 28 - BLUEBERRY ROAD			L	MOTOR OIL	50	L	KIMBERLY-CLARK CANADA: 50 L MOTOR OIL TO GROUND	P	Soil contamination	0
9300011817	15-Oct-93	THUNDER BAY DISTRICT	TRACK MILE 116.6, KAMINISTQUIA SUB-DIVISION, LAKEHEAD DIVISION			L	HYDRAULIC OIL	80	L	C.P. RAIL - 80 L OF HYDRAULIC OIL TO TRACKS FROM REPAIR EQUIPMENT.	N		0
9300009066	21-Oct-93	THUNDER BAY DISTRICT	RUSH & RAMBLER ROADS NORTH OF ENGLISH RIVER.			L	WASTE OIL	450	L	CANADIAN FOREST PRODUCTS-450 L CRANKCASE OIL TO ROAD.	P	Soil contamination	0
9300012441	2-Nov-93	THUNDER BAY DISTRICT	35 MILES WEST OF ARMSTRONG, \@HOT BOX DETECTOR SITE ON RAIL.			LW	DIESEL FUEL		UKN	BACKENTRY-CN RAIL-DIESEL FUEL TO SOIL AND POND.	C	Soil contamination	0
9300012488	4-Nov-93	THUNDER BAY DISTRICT	HEMLO MINE SITE			L	DIESEL FUEL	90	L	WILLIAMS OPERATING CO: 90L DIESEL FUEL LEAK FROM PUMP NOZZLE TO GROUND	C	Soil contamination	99
9300012518	5-Nov-93	THUNDER BAY DISTRICT	BETWEEN SCHREIBER AND COLDWELL			L	FUEL OIL	22	L	CP RAIL: 18-22 L FUEL OIL FROM ENGINE TO RAIL BED OVER 50 KM DISTANCE.	N	Soil contamination	0
9300013074	19-Nov-93	THUNDER BAY DISTRICT	OPEN PIT			L	HYDRAULIC OIL	12	L	WILLIAMS OPERATING CORP.-12L HYDRAULIC OIL ONTO GROUND FROM DRILL,CLEANED.	C	Soil contamination	99
9300013143	22-Nov-93	THUNDER BAY DISTRICT	RAIL BED BETWEEN CHAPLEAU & THUNDER BAY.			L	DIESEL FUEL	4500	L	CP RAIL: 4500L DIESEL LEAK FROM FUEL PUMP TO RAIL BED OVER 600KM.	P	Soil contamination	0
9300013250	25-Nov-93	THUNDER BAY DISTRICT	ON HWY. 17, 30 KM EAST OF NIPIGON, 400 METRES W. OF DUBLIN CRK, E OF KAMA BAY			LW	DIESEL FUEL	130	L	TRANSPORT TRUCK - 135 L OF DIESEL FUEL TO GROUND & CRK. FROM FUEL TANK.	N	Other	100
9300013949	16-Dec-93	THUNDER BAY DISTRICT	HWY 17 NORTH 15 KM EAST OF 614, DUNC LAKE			W	DIESEL FUEL	400	L	ARNOLD BROS. TRANSPORT - 400 L OF DIESEL FUEL TO LAKE FROM SADDLE TANKS	C	Water course or lake	50
9400000066	4-Jan-94	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	180	L	WILLIAMS MINE-180 LITERS HYDRAULIC OIL TO OPEN PIT,CONTAINED BY DYKE.	N		99
9400000344	14-Jan-94	THUNDER BAY DISTRICT	HWY 643 JUST EAST OF AROLAND INDIAN RESERVE.			L	HYDRAULIC OIL	45	L	ONTARIO HYDRO-45 L OF HYDRAULIC OIL TO LAND, CLEANED UP.	N		95
9400000383	15-Jan-94	THUNDER BAY DISTRICT	FIRST NATION RESERVE, LAC LA CROIX			L	FURNACE OIL		UKN	LAC LA CROIX RESERVE-UNK QUANT. OF FURNACE OIL TO HOUSE BASEMENT & SNOW.EPS	C	Multi Media Pollution	50
9400000478	18-Jan-94	THUNDER BAY DISTRICT	COMPANY ROAD,2 KM FROM HWY # 622			L	ROAD SALT	25	MT	LAFARGE-25 MT ROAD SALT TO DITCH,TRUCK SLID OFF ROAD,CLEANUP ONGOING.	N		0
9400001267	11-Feb-94	THUNDER BAY DISTRICT	UPSALA TWP \@CAMP #134			L	WASTE OIL	135	L	CANADIAN PACIFIC FOREST PRODUCTS: 135 L WASTE OILTO GROUND FROM TANK.	N		100
9400001369	14-Feb-94	THUNDER BAY DISTRICT	WILLIAMS MINE OPEN PIT			L	HYDRAULIC OIL		UKN	WILLIAMS OPERATING CORP.:HYDRAULIC OIL LEAK FROM LOADER TO GROUND	C	Soil contamination	0
9400001637	20-Feb-94	THUNDER BAY DISTRICT	HANSON LAKE \@VIA CREEK			W	TAILINGS	6750	L	LAC-DES-ISLES MINE: SEEPAGE FROM RECLAIM POND TO CREEK	P	Water course or lake	0
9400001762	23-Feb-94	THUNDER BAY DISTRICT	R.R.13,SITE 15.			L	FURNACE OIL	50	L	ANTONIAZZI FUELS-50 L FURNACE OIL TO GROUND, NOZZLE FELL OUT OF PIPE.	P	Multi Media Pollution	0
9400001838	25-Feb-94	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	45	L	WILLIAMS OPERATING CORP- 45 L HYDRAULIC OIL TO GROUND,CLEANED UP.	P	Soil contamination	0
9400002082	5-Mar-94	THUNDER BAY DISTRICT	RR 1 KAMINISKIQUIA			L	FURNACE OIL	90	L	PRIVATE RESIDENCE-90 L OFFURNACE OIL TO GROUND, CONTAINED,SOME CLEANUP.	P	Soil contamination	0
9400002207	9-Mar-94	THUNDER BAY DISTRICT				L	PROCESS WATER (NOT OTHERWISE SPECIFIED)	450	L	WILLIAMS OPERATING CORP.:450 L PROCESS WATER TO GROUND	N		0
9400003150	5-Apr-94	THUNDER BAY DISTRICT	HEMLO MINE SITE			L	FUEL (N.O.S.)	90	L	WILLIAMS OPERATING CO: 90 L FUEL OIL TO GROUND NO FURTER DETAILS KNOWN	P	Soil contamination	
9400003587	13-Apr-94	THUNDER BAY DISTRICT	MOOSE LAKE			W	SEDIMENT(SUSPENDED SOLIDS/ SAND/ SILT)		UKN	WILLIANS MINE - SILT TO MOOSE LAKE WHEN RUNOFF WATER BROKE THROUGH BERM.	P	Water course or lake	0
9400004182	27-Apr-94	THUNDER BAY DISTRICT				L	MINERAL OIL (LT 50 PPM PCB)		UKN	THUNDER BAY HYDRO:UNKNOWNAMOUNT OF TRANS. OIL TO GROUND-CLEANED UP	P	Soil contamination	98

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9400004465	4-May-94	THUNDER BAY DISTRICT	TRANSCANADA(HWY #11(17) AT SHABAQUA BESIDE MTO INSTALLATION			L	DIESEL FUEL	225	L	TRANSPORT TRUCK - 225 L OF DIESEL FUEL TO HWY. FROM SADDLE TANK.	N	Other	0
9400005021	18-May-94	THUNDER BAY DISTRICT				L	TAILINGS			LAC DES ILES MINES: TAILINGS NOTICED OUTSIDE TAILINGS MANAGEMENT AREA	P	Other	0
9400006101	13-Jun-94	THUNDER BAY DISTRICT	HWY #11, 37 KM NORTH OF NIPIGON, NORTH OF LEDGER TWP.			A	FREON (CFC)	112	KG	TRANSCANADA PIPELINES - 112 KGS FREON 1301 TO ATMFAULTY SMOKE DETECTOR.	C	Air Pollution	0
9400006186	14-Jun-94	THUNDER BAY DISTRICT	IN ATIKOKAN AT THE RAIL STATION			L	LUBRICATING OIL/GREASE			CN RAIL - LUBE OIL TO GROUND FROM LOCOMOTIVE'S CRANKCASE.	P	Soil contamination	0
9400006250	16-Jun-94	THUNDER BAY DISTRICT				L	GRINDING WATER	5000	L	HEMLO GOLD-1000-5000 L OFGRINDING WATER TO PLANT SITE,CONTAINED.	N	Soil contamination	0
9400006258	16-Jun-94	THUNDER BAY DISTRICT	HWY 597(LOC.#4622, SCOBLE TWP)			LW	TRANSFORMER OIL	50	L	ONT. HYDRO: 50 L NON-PCB TRANSFORMER OIL TO GRAVEL,TO DITCH, CLEANED UP	P	Water course or lake	90
9400006345	17-Jun-94	THUNDER BAY DISTRICT	MISSION ISLAND(PETRO-CAN STN)			L	FURNACE OIL	30	L	PETRO-CANADA: 30L FURNACEOIL TO SOIL, OVERFLOWED, CLEANED UP	P	Soil contamination	0
9400006378	17-Jun-94	THUNDER BAY DISTRICT	HEMLO GOLD MINE			L	MILL TAILINGS WITH CYANIDE		UKN	HEMLO GOLD - UNKNOWN AMT.MILL TAILINGS TO GROUND DUE TO OVERFLOW.	P	Soil contamination	0
9400006526	20-Jun-94	THUNDER BAY DISTRICT	MOOSE LAKE			W	SEDIMENT(SUSPENDED SOLIDS/ SAND/ SILT)		UKN	WILLIANS MINE - SILT TO MOOSE LAKE WHEN RUNOFF WATER BROKE THROUGH BERM.	P	Water course or lake	0
9400006989	29-Jun-94	THUNDER BAY DISTRICT				L	WASTEWATER WITH HEAVY METALS	2	M3	HEMLO GOLD-2000 L OF TREATED EFFLUENT TO GROUND,CONTAINED.	P	Soil contamination	0
9400007376	7-Jul-94	THUNDER BAY DISTRICT	BEHIND SURFACE BUILDING			L	DIESEL FUEL	205	L	WILLIAMS OPERATING CORP.-205L DIESEL TO ASPHALT & DIRT, ONGOING CLEANUP	C	Soil contamination	50
9400007583	12-Jul-94	THUNDER BAY DISTRICT	HWY #11, 45 KMS EAST OF LONGLAC			A	UNKNOWN		UKN	LIQUID CARBONIC- TRAILERSOVERTURNED ON HWY #11, LEAKING CYLINDERS,FD,OPP	P	Human health	0
9400007830	18-Jul-94	THUNDER BAY DISTRICT	WILLIAMS MINE SITE HEMLO			L	HYDRAULIC OIL	45	L	WILLIAMS OPERATING CORP. MAXIUM 45L HYDRAULIC OIL TO GROUND; CLEANED UP	C	Soil contamination	99
9400007950	19-Jul-94	THUNDER BAY DISTRICT	HWY 11, 20 KM EAST OF THUNDER BAY CITY			L	DIESEL FUEL	900	L	BACKENTRY, REIMER EXPRESS- EST. 900 L DIESEL FUEL TO HWY 11 FROM FUEL TANKS	C	Soil contamination	50
9400008090	24-Jul-94	THUNDER BAY DISTRICT	FUEL STORAGE AREA, HEMLO.			L	DIESEL FUEL	20	L	WILLIAMS OPERATING CORP.-20L DIESEL TO PAVEMENT, VALVE FAILURE,CLEANING UP	N		10
9400008302	29-Jul-94	THUNDER BAY DISTRICT	HEMLO MINE SITE			L	CALCIUM OXIDE (LIME)	23	KG	WILLIAMS OPERATING CORP.: 23 KG OF LIME(SOLID) TO THE GROUND, SHOVELED UP	N	Soil contamination	0
9400008782	10-Aug-94	THUNDER BAY DISTRICT	WEST ARTHUR ST/HWY #17, NEAR K-MART PLAZA.			A	NATURAL GAS (PIPELINE)		UKN	CENTRA GAS- NATURAL GAS LEAK FOR APPROX 5HRS,HIGHPRESSURE MAIN DAMAGED,FD.	P	Air Pollution	0
9400008784	10-Aug-94	THUNDER BAY DISTRICT	20 KM ON DEAD HORSE CREEK, 2 KM ONTO JACKPINE.			L	DIESEL FUEL	50	L	TRANSPORT TRUCK: 50 L DIESEL FUEL LEAKED TO ROAD FROM SADDLE TANK.	P	Soil contamination	
9400008798	11-Aug-94	THUNDER BAY DISTRICT	BLACK STURGEON FOREST MANAGEMENT UNIT			L	HERBICIDE (N.O.S.)	200	L	SUPERMARINE LTD-PLANE CRASH, HERBICIDE AND FUELTO GROUND.	P	Soil contamination	0
9400009170	20-Aug-94	THUNDER BAY DISTRICT				L	FLY ASH	1.5	MT	TRIMAC-1.5 TONNES DRY FLYASH TO GROUND,HOSE BLEW OFF,CLEANUP ONGOING.	N		0
9400009233	22-Aug-94	THUNDER BAY DISTRICT	BETWEEN ARMSTRONG AND SIOUX LOOKOUT 40 KM WEST OF SAVANT LAKE			L	DIESEL FUEL	1350	L	CN RAILWAY: 1 350 L DIESEL FUEL TO GROUND	C	Soil contamination	0
9400010647	27-Sep-94	THUNDER BAY DISTRICT	MILE 61 - POLAR ROAD			L	DIESEL FUEL	45	L	KIMBERLY-CLARK: 45 L DIESEL FUEL TO LAND	P	Soil contamination	100
9400010722	28-Sep-94	THUNDER BAY DISTRICT	AT THE EFFLUENT TREATMENT PLANT AT THE WILLIAMS MINE SITE			L	SLUDGE (N.O.S.)	900	L	WILLIAMS OPERATING CORP.-900 L OF SLUDGE TO GROUNDAT TREATMENT PLANT.	P	Soil contamination	0
9500000189	13-Oct-94	THUNDER BAY DISTRICT	CONCORDE RD,6.5 KM E OF SUN ROAD.			L	DIESEL FUEL	205	L	BACKENTRY/KIMBERLY CLARK-205 L DIESEL FUEL TO ROADFUEL LINE FAILED,CLEANED.	N		0
9400011385	18-Oct-94	THUNDER BAY DISTRICT	TRIO ROAD, LOGGING ROAD 38 MILES NORTHWEST OF TERRACE BAY.			L	FUEL OIL	450	L	KIMBERLY-CLARK CANADA- STORAGE TANK LEAK AT TRIOROAD LOGGING AREA.	C	Soil contamination	
9400011475	20-Oct-94	THUNDER BAY DISTRICT	LAKE SUPERIOR			W	OILY WATER (N.O.S.)			M/V CARTIERDOC: BALLAST PUMPED TO LAKE; OIL SHEEN RESULTED	C	Water course or lake	0
9400011716	27-Oct-94	THUNDER BAY DISTRICT	IN PASS LAKE AT THE PASS LAKE TRAIN STATION			L	HYDRAULIC OIL	100	L	C.N. RAIL - 100 L OF HYDRAULIC OIL TO GROUND FROM TRACK MACHINE.	P	Soil contamination	0
9400012073	7-Nov-94	THUNDER BAY DISTRICT	SHABAQUA, HWY 11 AT MTO YARD			L	UNKNOWN			ATOMIC TRANSPORT: LEAK OFPAINT RELATED PRODUCT FROM DRUM TO HWY. 11	P	Soil contamination	0
9400012844	2-Dec-94	THUNDER BAY DISTRICT	WABA EXTENSION,MILE MARKER 65.			L	DIESEL FUEL			KIMBERLY CLARK-UKN QTY DIESEL FUEL TO GRAVEL RD OVER 1 KM,NO RECOVERY.	P	Soil contamination	0
9400012952	6-Dec-94	THUNDER BAY DISTRICT	HWY 102 1 MILE EAST OF MUD LAKE ROAD 2-3 MILES FROM HWY 11/17 JUNCTION			L	GREEN LIQUOR	6500	L	CANEX TANK TRUCK-6500 L GREEN LIQUOR TO ROAD AND DITCH, MVA.	C	Soil contamination	0

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9400013061	9-Dec-94	THUNDER BAY DISTRICT	HWY 17, LAC DE MALAC			L	DIESEL FUEL	225	L	NEWHOPE TRANSPORT: 225 L DIESEL FUEL TO GROUND FROM SADDLE TANK.	P	Soil contamination	0
9500000263	12-Jan-95	THUNDER BAY DISTRICT	WEBEQUIE AIRPORT (MTO)			L	DIESEL FUEL	3000	L	MTO-3000 L DIESEL FUEL TOGROUND/SOIL FROM OVERFILLFURNACE TANK,UNCONTAINED.	P	Multi Media Pollution	0
9500000318	13-Jan-95	THUNDER BAY DISTRICT	SHABAQUA CORNERS (HWY 11/17), LAURIE TOWNSHIP			L	DIESEL FUEL	35	L	NORTHLAND TRANSPORT: 35 L DIESEL FUEL TO DITCH. TRUCK JACK-KNIFED.	P	Soil contamination	0
9500000535	17-Jan-95	THUNDER BAY DISTRICT				L	DIESEL FUEL	71	L	KLEYSEN TRANSPORT-71 L DIESEL TO FROZEN LAKE,MVARUPTURED SADDLE TANK.	P	Multi Media Pollution	0
9500000585	19-Jan-95	THUNDER BAY DISTRICT	SOUTH SIDE OF CATLONITE ROAD 17 MILES NORTH OF TERRACE BAY AT BLACK BAY.			L	DIESEL FUEL	900	L	TRANSPORT TRUCK- 900 L DIESEL FUEL TO LAND ON LAKE EDGE: TRUCK OVERTURN	P	Multi Media Pollution	
9500000856	27-Jan-95	THUNDER BAY DISTRICT	STATION 75, TRANS-CANADA PIPELINES ABOUT 25 MILES EAST OF NIPIGON.			A	HALON (CFC)	35	KG	TRANSCANADA PIPELINES 35 KG HALON 1301 TO AIR.	P	Air Pollution	
9500000975	1-Feb-95	THUNDER BAY DISTRICT	LAC DES ILES ROAD			L	DIESEL FUEL	6800	L	IMPERIAL OIL TANK TRUCK- 6800 L OF DIESEL FUEL TO GROUND,TRUCK OVERTURN.	C	Soil contamination	0
9500001848	4-Mar-95	THUNDER BAY DISTRICT	WILLIAMS MINE SITE, ON A HAUL ROAD.			L	GASOLINE		UKN	WILLIAMS OPERATING CORP.:UNK AMT OF GASOLINE TO ROAD FROM RUPTURED TANK.	P	Soil contamination	0
9500002890	3-Apr-95	THUNDER BAY DISTRICT	AT THE CORNER OF HWY. 11 & HWY. 17			L	DIESEL FUEL	250	L	PROVINCIAL AMERICAN TRUCKTRANSPORT - 250 L OF DIESEL FUEL TO GROUND.	P	Soil contamination	0
9500003461	21-Apr-95	THUNDER BAY DISTRICT	GULL BAY FIRST NATIONS COMM.			L	DIESEL FUEL	275	L	ONTARIO HYDRO-275 L OF DIESEL FUEL TO GROUND FROM FUEL TANK.	C	Soil contamination	
9500004196	9-May-95	THUNDER BAY DISTRICT	PIT AREA.			L	HYDRAULIC OIL	90	L	WILLIAMS OPERATING CORP.-90 L HYDRAULIC OIL TO GROUND, CLEANED UP.	C	Soil contamination	99
9500004398	14-May-95	THUNDER BAY DISTRICT	MILE 114.6, NIPPIGON SUB, 15 MILES EAST OF T.B., IN MACKENZIE.			LW	GASOLINE	900	L	C.P. RAIL: 900 L GASOLINETO TRACKS AND GROUND, CONTAINED WITH ABSORBENTS	P	Multi Media Pollution	0
9500004538	17-May-95	THUNDER BAY DISTRICT	5KM WEST OF FINMARK RD HWY 11			L	DIESEL FUEL			BACKENTRY:ARNOLD BROS MVAWITH MTO PLOW. UNK QUA OFDIESEL TO SHOULDER.			
9500004848	25-May-95	THUNDER BAY DISTRICT				L	WASTE OIL	225	L	WILLIAMS OPERATING CORP.-225 L WASTE OIL TO GRAVELDURING TRANSPORT,CLEANING	C	Soil contamination	10
9500005082	30-May-95	THUNDER BAY DISTRICT	EAVAMET LAKE NEAR EAVAMETOONG NATIVE LANDS			LW	DIESEL FUEL		UKN	NATIVE RESER. GEN. STN: DIESEL SEEPING TO LAKE FROM 1970'S SPILL	C	Multi Media Pollution	0
9500005142	1-Jun-95	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	135	L	WILLIAMS MINE - 135 L OF HYDRAULIC OIL TO GROUND FROM SCHRAMM DRILL.	N		0
9500005326	5-Jun-95	THUNDER BAY DISTRICT				L	WASTEWATER N.O.S.	900	L	HEMOLO GOLD MINES: 900 L WASTEWATER TO GROUND	P	Groundwater pollution	0
9500005435	7-Jun-95	THUNDER BAY DISTRICT	ALONG TRACKS FROM THUNDER BAY TO SCHREIBER			L	DIESEL FUEL	450	L	CPR - 450 L OF DIESEL FUEL TO TRACKS FROM MOVING LOCOMOTIVE.	N	Other	0
9500006558	5-Jul-95	THUNDER BAY DISTRICT	MOOSE LAKE- WILLIAMS MINE SITE.			W	WASTEWATER WITH CLAY		UKN	WILLIAMS OPERATING CORP. SILTY RUNOFF FROM BERM BREAK OF YARD RUNOFF.	P	Water course or lake	0
9500006601	6-Jul-95	THUNDER BAY DISTRICT	HEMLO GOLD MINE, HOLLOWAY TWP			L	WASTEWATER N.O.S.	2	M3	HEMLO GOLD- 2 M3 MINE WATER TO TRENCH FROM PIPELINE BREAK.	N		0
9500006800	12-Jul-95	THUNDER BAY DISTRICT	1ST HOUSE ON LEFT ON BLIND LINE ROAD OFF OF HWY 17.			L	FURNACE OIL	130	L	PRIVATE RESIDENCE-85-130 LITRES FURNACE OIL TO BASEMENT FLOOR AND SUMP.	P	Soil contamination	0
9500006909	13-Jul-95	THUNDER BAY DISTRICT	MILE 39 OF A-P ROAD 500, OFF SPRUCE RIVER ROAD			L	DIESEL FUEL			ABITIBI-PRICE: DIESEL FUEL TO GROUND FROM TRUCK	P	Soil contamination	50
9500007129	17-Jul-95	THUNDER BAY DISTRICT	HWY 11, NEAR KLOTZ LAKE (EAST OF GERALDTON)			L	SEWAGE,RAW UNCHLORINATED			HEARST SEPTIC- UNK QTY SEPTAGE TO HWY 11 FROM TRUCK. MNR.	P	Soil contamination	
9500008341	13-Aug-95	THUNDER BAY DISTRICT	SAVANNE TWP,18 MILES EAST OF HWY 17			L	SALT CAKE	20	T	C.P. RAIL: 20 TONS OF SALT CAKE TO GROUND :CAR DERAILED:CLEANING UP	N	Soil contamination	0
9500008616	18-Aug-95	THUNDER BAY DISTRICT	HWY 17 & HWY 614			L	DIESEL FUEL	60	L	UNKNOWN SOURCE-20-40 L DIESEL TO ASPHALT AT VACANT GAS STN.	P	Water course or lake	0
9500008777	22-Aug-95	THUNDER BAY DISTRICT				L	GEAR OIL	140	L	WILLIAMS MINE-140 LITERS GEAR OIL TO OPEN PIT CONTAINED & CLEANING UP	N		99
9500010040	22-Sep-95	THUNDER BAY DISTRICT	ONTARIO HYDRO GENERATING STATION AT KINGFISKER LAKE COMMUNITY.			L	DIESEL FUEL	300	L	ONTARIO HYDRO-300 L DIE- SEL TO GROUND AT KINGFIS-HER LAKE COMMUNITY.	C	Soil contamination	0
9500010044	23-Sep-95	THUNDER BAY DISTRICT				L	GASOLINE	10	L	LACDESMILLE LECF:10L GASOLINE TO GRAVEL PARK- ING AREA. CONTAINED. OPP	P	Soil contamination	0
9500010433	2-Oct-95	THUNDER BAY DISTRICT	GOLDEN GIANT MINE, HEMLO			L	WASTE OIL	10	L	HEMLO GOLD-10L WASTE OIL OVERFLOW TO GROUND FROM OVERFLOW OF CONTAINER.	C	Soil contamination	90
9500010429	3-Oct-95	THUNDER BAY DISTRICT	HWY 17, 1 KM WEST OF SUNSHINE HOTEL. (ABOUT 50 KM WEST OF THUNDER BAY CITY.)			L	KEROSENE		UKN	CP AMERICA-KEROSENE LEAK FROM 225 L DRUM, RECOVERED TO CONTAINER.	N		
9500010732	11-Oct-95	THUNDER BAY DISTRICT	HURONIAN HOTBOX STATION BETWEEN KASHAWE AND QUETICO.			L	DIESEL FUEL	40	L	BACKENTRY-40 L DIESEL TO GROUND FROM HOTBOX STATION.	C	Soil contamination	0
9500010868	15-Oct-95	THUNDER BAY DISTRICT	IN BEAVER POND ON ANCLIFFE RD. 200 M S. OF HWY 11/17			W	DIESEL FUEL	25	L	MNR -25 L OF DIESEL FUEL DUMPED IN BEAVER POND BY RESIDENT.	C	Water course or lake	0

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9500010975	18-Oct-95	THUNDER BAY DISTRICT	BUILDING OWNED BY REVENUE CANADA AT THE PIGEON RIVER BORDER CROSSING ON HWY 61.			L	FURNACE OIL	1600	L	REVENUE CANADA: 1600 L OFFURNACE OIL MISSING FROM U.S.T.,SOIL TEST ONGOING.	P	Soil contamination	0
9500011721	8-Nov-95	THUNDER BAY DISTRICT				LW	WASTEWATER WITH HEAVY METALS	1	M3	HEMLO GOLD-1 M3 FINAL EFFLUENT TO GROUND NEAR CREEK. LEAK STOPPED.	N		0
9500012929	13-Dec-95	THUNDER BAY DISTRICT	GOLDEN GIANT MINE			L	SLURRY (N.O.S.)	50	L	HEMLO GOLD MINES INC. - 50 L OF GOLD SLURRY TO GROUND FROM TANK.	P	Soil contamination	0
9600000141	7-Jan-96	THUNDER BAY DISTRICT				L	BUNKER FUEL OIL (NO. 4, 5 OR 6)	20	L	HEMLO GOLD MINES: 20L BUNKER C OIL TO GROUND.	N		96
9600000229	10-Jan-96	THUNDER BAY DISTRICT	PICKLE LAKE TERMINAL, HWY 599, 200 MI NORTH OF HWY 17.			LA	AVIATION GASOLINE	588	L	IMPERIAL OIL: 588 L OF AVIATION FUEL TO CONRETE CONTAINEMENT AREA, MCCR.	P	Air Pollution	90
9600000356	15-Jan-96	THUNDER BAY DISTRICT	GOLDEN GIANT MINE			L	MINE WATER (HEAVY METALS N.O.S.)	1	M3	HEMLO GOLD MINE - 1 M3 OF RECLAIM WATER TO LAND,POWER OUTAGE AT MILL.	P	Soil contamination	0
9600000512	18-Jan-96	THUNDER BAY DISTRICT	ON HWY. 11/17 ABOUT 200 YARDS FROM THE SUNSHINE BRIDGE			L	DIESEL FUEL		UKN	TRANSPORT TRUCK - DIESEL FUEL TO HWY. FROM SADDLE TANKS ON TRUCK, ACCIDENT.	P	Multi Media Pollution	0
9600000716	22-Jan-96	THUNDER BAY DISTRICT	LAC DES ISLES MINING ROAD, 8 KM IN FROM HWY 527 (@ 40 K NORTH OF THUNDER BAY)			L	DIESEL FUEL	3000	L	TRIMAC-3000L DIESEL TO ROAD SHOULDER,DITCH.CON-TAINED/CLEANING.MOEE.	C	Multi Media Pollution	0
9600002193	30-Mar-96	THUNDER BAY DISTRICT	HWY 11, REFLECTION LAKE (35 KM S. OF \@BEARDMORE)			LW	DIESEL FUEL	675	L	ACCORD TRANSPORT: 675 L DIESEL FUEL ON ICE FROM RUPTURED SADDLE TANK.	P	Water course or lake	0
9600002246	1-Apr-96	THUNDER BAY DISTRICT	AT SAVANT LAKE ABOUT 75 MI. W. OF ARMSTRONG			L	DIESEL FUEL		UKN	CN RAIL - DIESEL FUEL SPILL FROM TANK CAR INVOLVED IN DERAILMENT.	P	Multi Media Pollution	0
9600002275	2-Apr-96	THUNDER BAY DISTRICT	UPSULA STATION 62, GENERAL DELIVERY			L	LUBRICANT OIL(LUBE OIL)	35	L	TRANSCANADA PIPE: 35L SYNTHETIC OIL LEAKED TO SNOW. CLEANUP ONGOING.	N		50
9600002435	7-Apr-96	THUNDER BAY DISTRICT	KIMBERLEY CLARK BUSH CAMP AT MILE 62 ON SUPAWN ROAD, 45 MI. NORTH OF NAKINA.			L	DIESEL FUEL		UKN	KIMBERLY-CLARK CANADA DIESEL FUEL SPILL TO GROUND FROM TANK.	P	Soil contamination	0
9600003422	28-Apr-96	THUNDER BAY DISTRICT	HWY 17 3KM WEST OF MANITOUWADGE CORNERS, HEMLO.			L	WASTE OIL	182	L	WILLIAMS, HEMLO- 182L WASTE OIL TO GROUND/SNOW CONTAINED, CLEANING	P	Soil contamination	0
9600003535	30-Apr-96	THUNDER BAY DISTRICT	ON HWY. 17 E. 200 KM E. OF THUNDER BAY AT CAVERS HILL IN ROSSPORT AREA			L	DIESEL FUEL	200	L	TRANSPORT TRUCK - DIESEL FUEL TO HWY FROM ACCIDENTINVOLVING 2 TRANSPORTS.	P	Soil contamination	0
9600003606	2-May-96	THUNDER BAY DISTRICT	MILE 77.1, HERON BASE SUB LINE, BETWEEN MARATHON AND TERRACE BAY.			L	POTASH (POTASSIUM CHLORIDE)	1000	KG	CP RAIL:EST 1000KG POTASHTO GROUND DUE TO DERAIL- MENT. CLEAN-UP ONGOING.	P	Soil contamination	10
9600004245	14-May-96	THUNDER BAY DISTRICT	UPSULA SCHOOL BOARD.			L	FURNACE OIL		UKN	UPSULA SCHOOL-FUEL OIL SEEPING OUT OF GROUND TO SEPTIC HOLDING TANK.	C	Soil contamination	0
9600004330	16-May-96	THUNDER BAY DISTRICT	IN SMALL, UN-NAMED CRK. AT A MINING LOCATION IN MAGREGOR TWP., CONC. 2			W	SEDIMENT(SUSPEND ED SOLIDS/ SAND/ SILT)		UKN	TOM HOUSTON CONTRACTING - SILT TO CREEK AT JOB SITE.	C	Water course or lake	0
9600004411	18-May-96	THUNDER BAY DISTRICT	SOUTHEAST SIDE OF STURGEON RIVER RD AND HWY 11 INTERSECTION,25 MI W.OF			L	WASTE OIL	20	L	UNKNOWN SOURCE-OIL STAIN AND SHEEN ON ROADSIDE DITCH.	P	Water course or lake	0
9600004626	23-May-96	THUNDER BAY DISTRICT	JACQUES TWP.			L	TRANSFORMER OIL	2	L	ONTARIO HYDRO: 2 L OF NONPCB OIL FROM LEAKING TRANSFORMER BUSHING.	P	Soil contamination	99
9600004951	30-May-96	THUNDER BAY DISTRICT	NORTH RD, LOT OF PART 4, CONC 3, UPSALA			L	TRANSFORMER OIL	4	L	ONTARIO HYDRO- 4 L TRANS-FORMER OIL TO GRASS/DIRT SEAL LEAK,WILL CLEANUP.	C	Soil contamination	0
9600004990	31-May-96	THUNDER BAY DISTRICT				L	LUBRICANT OIL(LUBE OIL)	1125	L	WILLIAMS MINE-1125 L LUBEOIL TO GND.NO DRAINS. EXCAVATED & CLEANED.	C	Soil contamination	100
9600005091	3-Jun-96	THUNDER BAY DISTRICT	NIPIGON RIVER, ONT HYD SWITCHING STN AT END HWY 585, NORTH OF CAMERON FALLS GS			LW	TRANSFORMER OIL	18200	L	ONT HYDRO-18200 L MINERALOIL TO GND, NIPIGON R. VANDALISM. OPP, MOEE.	C	Multi Media Pollution	0
9600005250	6-Jun-96	THUNDER BAY DISTRICT	LITTLE GRAVEL RIVER SERVICE STATION OFF OF HWY 11/17.			L	DIESEL FUEL	30	L	CENTRAL CANADA FUELS- 30L DIESEL FUEL TO GROUNDFROM SPLIT HOSE.	N		90
9600005276	6-Jun-96	THUNDER BAY DISTRICT	STATION 75, TRANS-CANADA PIPELINES ABOUT 25 MILES EAST OF NIPIGON.			A	HALON (CFC)	25	KG	TRANSCANADA PIPELINES- 25 KG OF HALON TO AIR FROM TURBINE.	P	Air Pollution	0
9600005850	19-Jun-96	THUNDER BAY DISTRICT	BEARSKIN LAKE FIRST NATIONS			L	TRANSFORMER OIL	60	L	ONTARIO HYDRO-60 L NON- PCB TRANSFORMER OIL TO CLAY GRND,CLEANED-UP.	P	Soil contamination	90
9600006245	27-Jun-96	THUNDER BAY DISTRICT	HWY 102 AT THE TOP OF STRAWBERRY HILL			L	DIESEL FUEL	400	L	GUY'S TRUCKING-400 LITERSDIESEL TO SHOLDER OF HWY,OPP,MTO.	P	Soil contamination	0
9600006828	11-Jul-96	THUNDER BAY DISTRICT	LOOKOUT ROAD @ TRAILER HOME			L	DIESEL FUEL	1700	L	PRIVATE STORAGE TANK: 1700L COLOURED DIESEL TO SOIL FROM DRAINED TANK	C	Soil contamination	0
9600007200	19-Jul-96	THUNDER BAY DISTRICT	HWY 11 EASTBOUND, 0.2 KM EAST OF CAMP 25 ROAD, OVER A DISTANCE OF 3.2 KM.			L	WAX EMULSION		UKN	CHEMFLEET: UNK AMT OF NORWAX 520 ON HWY 11 OVER3.2 KM,OPP,MTO,CLEANING.	N		99
9600008115	12-Aug-96	THUNDER BAY DISTRICT				W	LUBRICANT OIL(LUBE OIL)	1	L	ONTARIO HYDRO-1 L BEARINGOIL AT OUTFALL AFTER KA- KABEKA GEN STN SHUTDOWN	P	Water course or lake	0
9600008948	2-Sep-96	THUNDER BAY DISTRICT				L	SLURRY (N.O.S.)	2	M3	HEMLO GOLD MINE-2 M3 OF SLURRY OVERFLOWED PRE- AERATION TANK TO GROUND	P	Groundwater pollution	90

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ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9600009000	3-Sep-96	THUNDER BAY DISTRICT				L	TRANSMISSION OIL	100	L	WILLIAMS MINE:100L TRANSMISSION FLUID TO GROUND. CLEANUP ONGOING.	P	Soil contamination	60
9600009278	9-Sep-96	THUNDER BAY DISTRICT	IN PARKING LOT JUST WEST OF THE HEMLO MILL			L	LUBRICATING OIL/GREASE	55	KG	HEMLO GOLD MINE - 55 KG OF OPEN GEAR OIL TO ASPHALT FROM BARREL.	N	Other	100
9600010200	30-Sep-96	THUNDER BAY DISTRICT	R R # 2, CORNER OF HWY # 588 & FOURTH SIDE RD, NOLALU.			L	FURNACE OIL	45	L	PRIVATE RESIDENCE- 45 L FURNACE OIL ONTO LAWN FROM FUEL TK, CLEANING UP	C	Soil contamination	10
9600010250	1-Oct-96	THUNDER BAY DISTRICT				L	DIRTY WATER (SUSPENDED SOLIDS/SAND)	15	M3	GOLDEN GIANT MINE-15 M3 DIRTY WATER TO GRND,DITCH& SEDIMENT POND.	N		0
9600010608	11-Oct-96	THUNDER BAY DISTRICT	R R # 2, CORNER OF HWY # 102/HILL RD IN KAMINISTIQUIA.			L	WASTE OIL		UKN	CAM EQUIPMENT- UNKNOWN QUANT OF WASTE OIL LEAK TO GRN'D, VANDALISM, OPP.	C	Soil contamination	0
9600010697	15-Oct-96	THUNDER BAY DISTRICT	STATION 77 AT JELLICOE			A	METHANE GAS, COMPRESSED (NATURAL GAS)		UKN	TRANSCANADA PIPELINES - NATURAL GAS TO AIR FOR 17 MINUTES.	P	Air Pollution	0
9600011504	4-Nov-96	THUNDER BAY DISTRICT	IN VILLAGE OF AUDEN ON CN PROPERTY			L	DIESEL FUEL	1800	L	C.N. RAIL - 1800 L OF DIESEL FUEL TO GROUND FROM STORAGE TANK.	P	Soil contamination	0
9600011672	8-Nov-96	THUNDER BAY DISTRICT	IN VILLAGE OF AUDEN ON CN PROPERTY			L	DIESEL FUEL	1800	L	C.N. RAIL - 1800 L OF DIESEL FUEL TO GROUND FAULTY VALVE ON TANK.	P	Soil contamination	0
9600012103	20-Nov-96	THUNDER BAY DISTRICT	KING FISHER LAKE FIRST NATIONS			L	TRANSFORMER OIL	40	L	ONTARIO HYDRO:40 L OF MINERAL OIL TO THE FROZENGROUND, CLEANED-UP.	P	Soil contamination	100
9600012252	24-Nov-96	THUNDER BAY DISTRICT				L	DIESEL FUEL	5	L	TRIMAC-5L OF DIESEL FUEL TO CONCRETE PAD FROM TOP-LOADING ARM- CLEANED.	N		100
9600012427	30-Nov-96	THUNDER BAY DISTRICT	HIGHWAY 11/17 AT CP RAIL OVERPASS WEST OF THUNDER BAY			L	DIESEL FUEL			TRANSPORT TRUCK: DIESEL FUEL FROM SADDLE TANKS TO DITCH	P	Other	0
9600013176	23-Dec-96	THUNDER BAY DISTRICT	HEMLO PLANT.			L	AMMONIUM NITRATE	1000	KG	ICI SUPERIOR EXPLOSIVES-1000 KG AMMONIUM NITRATE PRILLS TO GROUND, CLEANED	P	Soil contamination	95
9700000245	8-Jan-97	THUNDER BAY DISTRICT	BETWEEN NIPIGON AND SCHREIBER AT GRAVEL RIVER BRIDGE ON HWY #17			L	DIESEL FUEL		UKN	TWO MARAY CONSTRUCTION TRANSPORTS, UNKN QNTY OF DIESEL FUEL TO HIGHWAY	P		0
9700000351	13-Jan-97	THUNDER BAY DISTRICT	WEBEQUIE AIRPORT.			L	FUEL OIL	20	L	WASAYA AIRWAYS-20 L FUEL TO WEBEQUIE AIRPORT GR'NDDURING DELIVERY, CLEANED.	P	Soil contamination	99
9700000352	13-Jan-97	THUNDER BAY DISTRICT	SANDY LAKE AIRPORT			L	FUEL OIL	30	L	WASAYA AIRWAYS-30 L FUEL TO SANDY LAKE AIRPORT RAMP, WILL CLEANUP. MTO.	P	Soil contamination	0
9700001579	19-Feb-97	THUNDER BAY DISTRICT	NIPIGON BAY, VERT ISLAND			LA	AVIATION FUEL (JET A OR B, TURBO)	136	KG	FALCONBRIDGE LTD: 136 KG OF AVIATION FUEL TO AIR & SNOW	P	Multi Media Pollution	0
9700002052	1-Mar-97	THUNDER BAY DISTRICT	HWY 17 AT PEARL LAKE, NORTH WEST REGION\@			L	DIESEL FUEL		UKN	SCHNEIDER NATIONAL:UNK QUANTITY OF OPERATING FLUIDS TO DITCH.	P	Soil contamination	0
9700002055	1-Mar-97	THUNDER BAY DISTRICT	HWY 11 NEAR ORIENT BAY \@NEAR THE ROYAL WINDSOR LODGE			L	DIESEL FUEL	600	L	QUICK X TRANSPORT:600L DIESEL FUEL CONTAINED INDITCH.	P	Soil contamination	0
9700003556	7-Apr-97	THUNDER BAY DISTRICT	SHABAQUA CORNERS- LYNN'S PLACE RESTAURANT & GAS BAR			LW	DIESEL FUEL	450	L	LYNN'S PLACE-450L OF DIESEL TO GROUND & SWAMP.	P	Water course or lake	0
9700003726	9-Apr-97	THUNDER BAY DISTRICT	ON BERNADINE ROAD, 25 MILES N/W OF GERALDTON			L	DIESEL FUEL	20	L	KIMBERLY-CLARK: 20 L OF DIESEL TO FROZEN GROUND, CONTAINED AND CLEANED UP.	P	Soil contamination	95
9700003604	11-Apr-97	THUNDER BAY DISTRICT	HWY. 17, 40 KM EAST OF NIPIGON, HIGHWAY PULL-OFF			L	LECITHIN	90	L	POINTS N. TRANSPORTATION 90 L LECITHIN TO GROUND CLEANING UP	P	Soil contamination	0
9700005394	27-May-97	THUNDER BAY DISTRICT	HWY 17 DITCH, 8 KM EAST OF HWY 614 IN THE DITCHLINE, STN 17+925 TO 18+160.			L	CREOSOTE		UKN	UNKNOWN SOURCE-GREEN AND BROWN STAIN TO DITCH ALONG A 250M STRETCH.	C	Soil contamination	0
9700005577	30-May-97	THUNDER BAY DISTRICT	HWY 17 BETWEEN T.BAY AND SHABEQUA CORNERS.			L	DIESEL FUEL		UKN	PRIVATE OWNER-DIESEL FUEL SPILL TO GROUND MOOSE COLLISION.	P	Soil contamination	0
9700005687	3-Jun-97	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	180	L	WILLIAMS, HEMLO: 180 L NEW HYDRAULIC OIL TO DITCH,CONTAINED,CLEANING.	P	Soil contamination	0
9700005999	10-Jun-97	THUNDER BAY DISTRICT	JCT OF HWY 11 & 17 NEAR SHABAQUA CORNERS.			L	DIESEL FUEL		UKN	2 TRANSPORT TRUCKS COLLIDED, FATAL MVA, FUELCONSUMED IN FIRE.	P	Soil contamination	0
9700006108	12-Jun-97	THUNDER BAY DISTRICT	HWY # 17, EAST SIDE OF BRIDGE ON THE LITTLE PIC RIVER.			L	DIESEL FUEL	135	L	TRANS X-135 L DIESEL & UNK QUANT OF POWDER DE- TERGENT TO HWY # 17, FD.	P	Water course or lake	0
9700006375	17-Jun-97	THUNDER BAY DISTRICT	SNOW LAKE FROM ONTARIO HYDRO ATIKOKAN TGS SEWER OUTFALL			LW	TRANSFORMER OIL (N.O.S.)	450	L	ONTARIO HYDRO: 450 L OF TRANSFORMER OIL TO GROUNDAND LAKE, BOOMED.	P	Water course or lake	0
9700006852	26-Jun-97	THUNDER BAY DISTRICT	WILLIAMS MINE, HEMLO			A	PROPANE		UKN	WILLIAMS MINE-PROPANE LEAK TO AIR, VOLUME UNKNOWN.	P	Air Pollution	0
9700008247	24-Jul-97	THUNDER BAY DISTRICT	HWY 3 102 WESTBOUND, 0.5-1 KM WEST OF OTTO RD.			L	GASOLINE		UKN	YANCO TRANSPORT TRUCK- OVERTURNED ON HWY # 102, GASOLINE LEAK, MTO & OPP.	P	Soil contamination	0
9700008314	26-Jul-97	THUNDER BAY DISTRICT	GOLDEN GIANT MINE			A	PROPANE	20	L	SUPEROIR PROPANE-20 L PROPANE VENTING TO ATM ATSTORAGE SITE.	N		0
9700008525	31-Jul-97	THUNDER BAY DISTRICT				L	GRINDING WATER	20	M3	GIANT MINE-10-20 M3 OF GRINDING WATER TO PLANT SITE,CONTAINED.	N	Soil contamination	0
9700008648	1-Aug-97	THUNDER BAY DISTRICT				L	TAILINGS RUN OFF WATER		UKN	BATTLE MOUNTAIN GOLD: TAILING SOLUTION SPILLED TO SEDIMENTATION POND.	P	Soil contamination	0

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9700009079	11-Aug-97	THUNDER BAY DISTRICT				L	MINE WATER (HEAVY METALS N.O.S.)	0.5	M3	GIANT MINE- 0.5 M3 OF LEACH TANK WATER TO GROUND, CLEANING.	N	Soil contamination	0
9700009327	16-Aug-97	THUNDER BAY DISTRICT	AT SERVICE STATION AT 1485 JOHN ST.			L	DIESEL FUEL	200	L	CENTRAL CANADA FUELS-200 L OF DIESEL FUEL TO GRAVEL DURING DELIVERY.	P	Soil contamination	0
9700009358	17-Aug-97	THUNDER BAY DISTRICT	TREWORTHA TOWNSHIP, MLV 61+5.21 KM ON TRANSCANADA PIPELINE.			L	WATER	130	M3	TRANSCANADA PIPELINES - 130K LITRES TEST WATER SPILLED TO LAND.	N	Soil contamination	0
9700009436	18-Aug-97	THUNDER BAY DISTRICT	DOG RIVER AREA, ON MACK RD. 2,3 KM WEST OF INTERSECT OF MACK RD. & SIDEEN RD.			L	VISION, ROUNDUP, GLYPHOSATE	1400	L	ZIMMER AIR SERVICES-1400L VISION HERICIDE, TO ROADWAY. CLEANING.	P	Soil contamination	10
9700010264	18-Aug-97	THUNDER BAY DISTRICT	SWALLOW LAKE AIRSTRIP			L	PESTICIDE N.O.S.	1900	L	BACKENTRY-AVENOR:1900L PESTICIDES DUMPED ON GROUND.	P	Soil contamination	0
9700010062	1-Sep-97	THUNDER BAY DISTRICT	GOLDEN GIANT MINE,BOMBY TWP.			L	ORE SLURRY	10	M3	GOLDEN GIANT MINE-10 M3 GRINDING SLURRY TO GRND AND W.W.T.P.,CONTAINED.	N		99
9700010215	5-Sep-97	THUNDER BAY DISTRICT				L	LIME SLURRY/SLUDGE	500	L	BATTLE MOUNTAIN GOLD: 500L WATER AND HYDRATED LIME TO GROUND.	P	Soil contamination	0
9700010783	17-Sep-97	THUNDER BAY DISTRICT	ONTARIO HYDRO GENERATING PLANT IN KINGFISHER LAKE.			L	DIESEL FUEL		UKN	ONTARIO HYDRO-UNK QUANT DIESEL LEAK INSIDE DYKE AT KINGFISHER LAKE, EPS.	P	Soil contamination	10
9700010933	21-Sep-97	THUNDER BAY DISTRICT				L	TAILINGS RUN OFF WATER	1000	L	BATTLE MOUNTAIN GOLD: 1000 L RECLAIM WATER TO GROUND.	P	Soil contamination	0
9700012670	29-Oct-97	THUNDER BAY DISTRICT	MILE 66, WABA EXTENSION			L	DIESEL FUEL	160	L	KIMBERLY CLARK:160L DIESEL TO GROUND AROUND STORAGE TANK.	P	Soil contamination	10
9700012969	6-Nov-97	THUNDER BAY DISTRICT	45 KM N/E OF NAKINA			L	DIESEL FUEL	180	L	KC FOREST PROD. 180 L DIESEL TO GROUND. CLEANED UP.	P	Soil contamination	90
9700013024	7-Nov-97	THUNDER BAY DISTRICT	ADAMSON TWP,BUSH CAMP 60 KM NORTH OF HURKETT.			L	DIESEL FUEL	450	L	STURGEON TIMBER-450 L DIESEL FUEL TO GROUND, CONTAINED,CLEANUP ONGOING	P	Soil contamination	0
9700013042	8-Nov-97	THUNDER BAY DISTRICT	ONE ISLAND LAKE, FOWLER TWP.			W	SEWAGE,RAW UNCHLORINATED		UKN	SOURCE UNKNOWN - SEWAGE IN LAKE, EST. 10-20 GAL. SAMPLE COLLECTED/PHOTOS.	P	Water course or lake	0
9800000335	9-Jan-98	THUNDER BAY DISTRICT				A	HALON (CFC)	248	KG	ONTARIO HYDRO-248 KG HALON 1301 TO ATMOSPHERE.	P	Air Pollution	0
9800000573	17-Jan-98	THUNDER BAY DISTRICT	HWY 17 AT ORIENT BAY.			L	DIESEL FUEL		UKN	A.M.BOWMAN TRUCKING-UKN QTY DIESEL TO DITCH,MVA, OPP,MTO.	P	Multi Media Pollution	0
9800001652	20-Feb-98	THUNDER BAY DISTRICT	HWY 11-17, 5 KM SOUTH OF HWY 527			L	AVIATION FUEL (JET A OR B, TURBO)	10	L	TRANSPORT TRUCK:SMALL QUANTITY OF JET FUEL SPILLED TO DITCH.	N		0
9800002485	19-Mar-98	THUNDER BAY DISTRICT	HWY 11 JUST WEST OF GERALDTON.			L	PAINT THINNERS	180	L	PCY CARRIERS- 180 L OF PAINT THINNER TO GROUND, LEAKING DRUM,CONTAINED.	P	Soil contamination	0
9800002625	23-Mar-98	THUNDER BAY DISTRICT	HWY 11			L	DIESEL FUEL	2200	L	BACKENTRY:2200L DIESEL SPILLED TO HWY	P	Soil contamination	98
9800003093	1-Apr-98	THUNDER BAY DISTRICT	50 KM NORTH OF HWY 17 ON HWY 11			L	DIESEL FUEL	900	L	MICHEL KOTURE TRANSPORT - 900L DIESEL TO ROADWAY CONTAINED/CLEANED.	N		90
9800003636	17-Apr-98	THUNDER BAY DISTRICT	SHEBANDOWAN MINE			L	NICKEL SLURRY	200	LBS	SHEBANDOWAN MINE - SPILL OF 200 LBS OF NICKEL SLURRY.	N	Soil contamination	100
9800004051	29-Apr-98	THUNDER BAY DISTRICT	SHABOQA HWY 11			L	DIESEL FUEL		UKN	TRANSPORT ACCIDENT SPILL OF DIESEL TO 1.3 MILES OF HIGHWAY.	P	Soil contamination	0
9800004059	29-Apr-98	THUNDER BAY DISTRICT	HWY 17 SHABAQUA,1.5 KM'S EAST OF MTO YARD.			L	DIESEL FUEL	227	L	ARNOLD BROTHERS TRANSPORT-227 L DIESEL OVER 30 M OF HWY,OPP,MTO.	N		99
9800004888	20-May-98	THUNDER BAY DISTRICT	HWY 599 NEAR GRAND BAY			L	FUEL OIL	225	L	TRANSPORT TRUCK - 50 GAL FUEL OIL TO SHOULDER, ,OPP,MTO.	N		99
9800005817	16-Jun-98	THUNDER BAY DISTRICT	CAT LAKE FIRST NATIONS 450 KM NNW OF THUNDER BAY			L	DIESEL FUEL		UKN	ENV CDA: UNK QUA DIESEL SPILLED TO GROUND FROM FUEL EXPANSION IN TANKS.	P	Soil contamination	0
9800006106	24-Jun-98	THUNDER BAY DISTRICT	UNORG. TWP. NEAR DORION, OFF BLACK BAY DR.			L	GASOLINE	32	L	OUTLAND REFORESTRATION - 32 L GASOLINE TO GROUND CONTAINED/CLEANING.	P	Soil contamination	99
9800006347	30-Jun-98	THUNDER BAY DISTRICT	BETWEEN COMPRESSOR STATIONS 67 AND 69 ON HIGHWAY 527			L	HYDRAULIC OIL			OJ PIPELINES: HYDRAULIC OIL TO GROUND FROM BACKHOE	C	Soil contamination	100
9900006587	9-Jul-98	THUNDER BAY DISTRICT	5 MI. WEST OF SCHREIBER, MILE 5 NIPPIGON SUB-DIVISION			L	WHEAT (GROUND)		UKN	CP RAIL - SMALL AMOUNT OF WHEAT TO GROUND FROM HOPPER CAR.	N	Other	0
9800006954	17-Jul-98	THUNDER BAY DISTRICT	TCPL MAIN LINE STN # 64, OFF HWY # 17, RAITH.			A	METHANE GAS, COMPRESSED (NATURAL GAS)		UKN	TRANSCANADA PIPELINES-UNKQUANT NATURAL GAS TO ATM FOR 63 MIN,VALVE FAILURE.	P	Air Pollution	0
9800007956	14-Aug-98	THUNDER BAY DISTRICT				L	WASTEWATER N.O.S.	1	M3	BATTLE MOUNTAIN GOLD: 1M3 WASH WATER SPILLED TO GROUND.	P	Soil contamination	50
9800008644	5-Sep-98	THUNDER BAY DISTRICT	TAILINGS BASIN			L	MINE WATER (HEAVY METALS N.O.S.)	40	L	WILLIAMS MINE- 40 L RECLAIM WATER TO GRAVEL DUE TO CRACKED PIPE.	P	Soil contamination	0
9800009413	28-Sep-98	THUNDER BAY DISTRICT	HWY # 17, 10 KM WEST OF UPSALA.			A	PROPANE		UKN	PRIVATE TRAILER- MVA ON HWY # 17,EXPLOSION OF UNKQUANT SMALL PROPANE CYLI.	N		0
9800010289	27-Oct-98	THUNDER BAY DISTRICT	DOG LAKE INLET AT SILVER FALLS RD. FOWLER TWP.			LW	HYDRAULIC OIL	68	L	PETER KIEWIT SONS- 68 L HYDRAULIC OIL INTO LAKE INLET/GRND FROM EXCAVATOR	C	Water course or lake	90
9800010773	11-Nov-98	THUNDER BAY DISTRICT	CP RAIL TRACK AT GRAHAM RD CROSSING \@25 KM WEST OF UPSALA TOWN			AL	SMOKE			CP RAILS- TRUCK/TRAIN COLLISION, STYRENE MONO- MER IN NEARBY CARS, FIRE.	P	Air Pollution	0

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9800011084	22-Nov-98	THUNDER BAY DISTRICT	GOLDEN GIANT MINE.			L	CARBON (CHARCOAL)	4	L	TRANSPORT TRUCK-4 LITERS CARBON SOLUTION TO GRND FROM LEAKING VALVE.	P	Soil contamination	90
9800011282	29-Nov-98	THUNDER BAY DISTRICT	ALONG RAIL TRACKS FROM RAITH TO MARTIN IN THE KAMINISTIQUIA SUBDIVISION			L	DIESEL FUEL		UKN	C.P. RAIL - SMALL AMOUNT OF DIESEL FUEL SPRAYED ALONG 64 MILES OF TRACK.	P	Soil contamination	0
9800011735	15-Dec-98	THUNDER BAY DISTRICT	GOLDEN GIANT MINE NEAR MARATHON AT THE EAST SIDE OF THE MILL			L	PROCESS WATER (HIGH PH)		UKN	BATTLE MOUNTAIN GOLD MINE- EDUCTOR WATER TO LAND FROM LEAKING TRUCK.	C	Soil contamination	0
9900000030	2-Jan-99	THUNDER BAY DISTRICT				L	MINE WATER	135	L	WILLIAMS MINE- 135 L OF RECLAIM WATER TO GROUND DUE TO POWER FAILURE.	P	Soil contamination	0
9900000056	3-Jan-99	THUNDER BAY DISTRICT				L	SLURRY (N.O.S.)		UKN	BATTLE MOUNTAIN GOLD-UKN QTY SLURRY UNDER DOOR TO GROUND,CONTAINED,FROZEN.	N		0
9900000314	14-Jan-99	THUNDER BAY DISTRICT	1.5 KM WEST OF WEST DORIAN LOOP ON HWY 17, EAST OF THUNDER BAY			A	PROPANE			TRIMAC TRANSPORT: PROPANE LEAKING TO ENV AFTER MOTOR VEHICLE ACCIDENT.	P	Air Pollution	0
9900000432	18-Jan-99	THUNDER BAY DISTRICT	ON HWY. 17 4 KM WEST OF PEARL (ABOUT 32 KM EAST OF THUNDER BAY)			L	DIESEL FUEL		UKN	TRANSPORT TRUCKS (N.O.S) -DIESEL FUEL TO HWY. 17 FROM SADDLE TANKS, MVA.	P	Soil contamination	90
9900000561	22-Jan-99	THUNDER BAY DISTRICT				L	CARBON (CHARCOAL)	1362	KG	BATTLE MOUNTAIN GOLD-1362KG FRESH CARBON TO SNOW COVERED GROUND.	N		0
9900000786	27-Jan-99	THUNDER BAY DISTRICT				L	SLURRY (N.O.S.)	30	M3	BATTLE MOUNTAIN GOLD-30M3 SLURRY UNDER DOOR TO GROUND.	N		0
9900000945	2-Feb-99	THUNDER BAY DISTRICT	HWY 17, 20 K EAST OF NIPIGON, 500 M OF OZONE CREEK			L	DIESEL FUEL	500	L	TRANSPORT TRUCK-EST 500L DIESEL TO HWY SHOULDER; MTO, OPP.	P	Soil contamination	0
9900000952	2-Feb-99	THUNDER BAY DISTRICT	HWY 17, 40 K WEST OF MARATHON			L	POTASSIUM HYDROXIDE SOLUTION	240	L	YANKEE TRANSPORT-240L POTASSIUM HYDROXIDE SOLN TO TRAILER,SNOW.OPP,F/D.	P	Soil contamination	0
9900001206	11-Feb-99	THUNDER BAY DISTRICT	ON HWY 593 9 KM FROM HWY 61			L	DIESEL FUEL		UKN	TRANSPORT TRUCK-UKN QTY DIESEL TO DITCH FROM LOGGING TRUCK,OPP,MTO.	P	Soil contamination	0
9900001612	25-Feb-99	THUNDER BAY DISTRICT	BATTLE MOUNTAIN GOLD MINE.			L	PROCESS WATER (NOT OTHERWISE SPECIFIED)	1	M3	BATTLE MOUNTAIN GOLD- 1 M3 EDUCTOR WATER TO SNOW FROM OPEN VALVE.	P	Soil contamination	0
9900001870	5-Mar-99	THUNDER BAY DISTRICT	PYRAMID ROAD(LOGGING ROAD), 18 KM WEST OF UPSULA			L	DIESEL FUEL	450	L	BUCHANAN FOREST PRODUCTS 450 L DIESEL FUEL TO ROADAND DITCH.	P	Soil contamination	50
9900003733	29-Apr-99	THUNDER BAY DISTRICT	64 KM SOUTH OF LONGLAC ON ASTER NORTH ROAD.			L	HYDRAULIC OIL	363	L	KIMBERLY CLARK-363 LITERSHYDRAULIC OIL TO ROAD ANDDRY DITCH,CONTAINED.	P	Soil contamination	0
9900003802	30-Apr-99	THUNDER BAY DISTRICT				L	TAILINGS	10	L	BLTTLE MOUNTAIN: 10L MINE TAILINGS SPILLED TO GROUND.	P	Soil contamination	98
9900010936	7-May-99	THUNDER BAY DISTRICT	CAN OP GAS STATION IN ARMSTRONG.			L	PETROLEUM DISTILLATES (N.O.S.)		UKN	BACKENTRY- CAN-OP SERVICESTATION, CONTAMINATED SOIL, HISTORIC SPILLS.	C	Soil contamination	0
9900004200	10-May-99	THUNDER BAY DISTRICT	HEMLO MINE SITE			L	TRANSMISSION OIL	200	L	WILLIAMS OPERATING CO. - 200 L OF TRANSMISSION FLUID TO GROUND FROM DRUM	C	Soil contamination	0
9900004302	13-May-99	THUNDER BAY DISTRICT				L	TAILINGS RUN OFF WATER	10	M3	BATTLE MOUNTAIN GOLD:10M3 RECLAIM WATER LEAKED ONTO GRAVEL.	P	Soil contamination	10
9900005215	7-Jun-99	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLD MINE NEAR MARATHON AT THE EFFLUENT TREATMENT			L	CLARIFIER EFFLUENT (HIGH IN AMMONIA)	20	L	BATTLE MOUNTAIN GOLD MINE-20 OF CLARIFIER EFFLUENTTO GROUND, OVERFLOW.	P	Soil contamination	0
9900006076	26-Jun-99	THUNDER BAY DISTRICT	NORTH SIDE HWY 17, BESIDE CPR TRACKS, 10 K WEST OF RAITH			A	SMOKE			UNK OWNER: 2-3000 RAIL TIES BURNING.BLACK SMOKE.MNR, OPP, ERP.	C	Multi Media Pollution	0
9900006701	12-Jul-99	THUNDER BAY DISTRICT				L	LIME SLURRY/SLUDGE	400	L	BATTLE MOUNTAIN GOLD:400 L LIME SLURRY TO GRAVEL. SUMP FAILURE. CLEANING.	P	Soil contamination	80
9900007192	23-Jul-99	THUNDER BAY DISTRICT	GRAHAM COMMUNITY, 70 MILES NORTHWEST OF THUNDER BAY ON ABITIBI CONSO. PROPERTY			A	SMOKE		UKN	ASOURCE UNK-HEAVY SMOKE TO ATM FROM LARGE QUANTI-TY OF RAIL TIES ON FIRE.	C	Air Pollution	0
9900007963	12-Aug-99	THUNDER BAY DISTRICT	TAILINGS BASIN			L	MINE WATER (HEAVY METALS N.O.S.)	675	L	WILLIAMS MINE- 675 L MINEWATER TO CONTAINMENT AREA IN TAILING BASIN.	N	Soil contamination	60
9900008359	23-Aug-99	THUNDER BAY DISTRICT	CONCESSION 5 EAST OF HWY 530, MARKS TOWNSHIP			L	DIESEL FUEL		UKN	BACK ENTRY-BRUNOS CONTRT DIESEL FUEL SPILLED TO GROUND NEAR CREEK	C	Soil contamination	99
9900009519	22-Sep-99	THUNDER BAY DISTRICT	DUMP POND			LW	MINE WATER (HEAVY METALS N.O.S.)	450	L	WILLIAMS MINE- 450 L MINEWATER TO DUMP POND WHILE BLEEDING LINE.	P	Soil contamination	0
9900009523	22-Sep-99	THUNDER BAY DISTRICT	WILLAIMS MINE SITE HEMLO EFFLUENT TREATMENT PLANT			L	CALCIUM HYDROXIDE (HYDRATED LIME)	10	PND	WILLIAMS MINE SITE-10 PDSHYDRATED LIME TO GRND, CONTAINED,RE-USED.	N		100
9900010471	19-Oct-99	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			L	SLURRY (N.O.S.)	1	M3	BATTLE MOUNTAIN GOLD MINE-1 M3 OF SLURRY TO GROUND, OVERFLOW,CONTAINED.	P	Soil contamination	90
9900011526	20-Nov-99	THUNDER BAY DISTRICT	ON HWY. 17 E. OF THE WHITE RIVER BRIDGE ABOUT 50 KM E. OF MARATHON			L	DIESEL FUEL		UKN	TRANSPORT TRUCK (N.O.S) - DIESEL FUEL TO HWY. 17 FROM SADDLE TANKS.	N		0
9900011723	26-Nov-99	THUNDER BAY DISTRICT	CATLANITE ROAD, MILEAGE #58 (BETWEEN LONGLAC AND TERRACE BAY)			L	DIESEL FUEL	400	L	R.W.TRANSPORT-400L DIESELTO GRAVEL ROAD & SHOULDER-ROLL-OVER. TO EXCAVATE.	C	Soil contamination	0

Table H-4
Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9900013029	10-Jan-00	THUNDER BAY DISTRICT	AT TECHNOLOGIC TIMBER, HWY 593, 13 KM UP DEVON ROAD			L	DIESEL FUEL	200	L	TECHNOLOGIC TIMBER:200 L DIESEL TO GROUND DURING FILL-UP,CONTAINED,CLEANED	C	Soil contamination	90
9900013231	17-Jan-00	THUNDER BAY DISTRICT	HWY 17 WEST, 5KM WEST OF RAITH			L	DIESEL FUEL		UKN	PETRO CAN: UKN QTY DIESELFROM FUEL TANKS,NO CARGO LEAKS.MVA.OPP,F/D,MTO.	C	Soil contamination	50
9900013260	18-Jan-00	THUNDER BAY DISTRICT	HWY 17, 5 KM EAST OF SHADAQUA			L	DIESEL FUEL	100	L	TRANSPORT TRUCK: 100 L DIESEL TO HWY 17 FROM TRUCK ACCIDENT, OPP, MTO.	P	Multi Media Pollution	0
9900013330	21-Jan-00	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			A	SMOKE		UNK	BATTLE MOUNTAIN GOLD MINE-FIBREGLASS FIRE IN MILL RESULTING IN SMOKE TO ATM	P	Air Pollution	0
9900013532	28-Jan-00	THUNDER BAY DISTRICT	PACELAKE RD., 27 KM IN, 32 MILES NORTH OF THUNDERBAY,			L	DIESEL FUEL	10	L	CENTRAL CANADA FUELS- 10 L OF DIESEL FUEL TO GRND DURING TRANSFER. MVA.	P	Soil contamination	0
9900014283	24-Feb-00	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			L	WASTE OIL	20	LIT	BATTLE MOUNTAIN GOLD MINE-OIL SPILL TO LAND 20 LIT- CONTAINED AND CLEANED	P	Soil contamination	99
9900014602	2-Mar-00	THUNDER BAY DISTRICT	HWY 17, ABOUT 65 MILES WEST OF THUNDER BAY BETWEEN UPSALA AND RAITH			L	DIESEL FUEL	100	L	BUCHANAN FOREST-100 L DIESEL TO HWY SHLDR,CARGOFITTING LEAK. TO CLEAN.	C	Soil contamination	0
9900014780	9-Mar-00	THUNDER BAY DISTRICT	KAMINISTIQUIA RIVER FROM SILVER FALLS G.S.			W	LUBRICANT OIL(LUBE OIL)	10	L	ONTARIO HYDRO,SILVER FALL-10 L LUBE OIL TO KAMI- NISTIQUIA RIVER. CLEANING	P	Water course or lake	50
9900014875	11-Mar-00	THUNDER BAY DISTRICT				L	MINE WATER (HEAVY METALS N.O.S.)	4.5	M3	WILLIAMS OPERATING CORP- 4.5 M3 MINE WATER DRAINEDTO CONTAINMENT.	P	Soil contamination	0
9900015036	17-Mar-00	THUNDER BAY DISTRICT	RAILWAY LINE (MILEAGE 96.1), KAMINISTIQUIA SUB, JUST WEST OF TB			L	SALT CAKE		UNK	CP RAIL: SALT CAKE SPILL TO TRACKS OVER 20 MILE STRETCH.UNRECOVERABLE.	P	Multi Media Pollution	0
9900015114	20-Mar-00	THUNDER BAY DISTRICT	BAWK (RAIL POINT), BURROWS LAKE, HALF WAY BETWEEN LONGLAC AND NAKINA			LW	DIESEL FUEL		UKN	CN RAIL-DIESEL FUEL IN ICE ON BURROWS LAKE'S SHORE. CLEANUP TOMORROW.	P	Multi Media Pollution	0
9900015257	24-Mar-00	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			L	TAILINGS	1500	LIT	BATTLE MOUNTAIN GOLD MINE-1500 LITRES OF TAILINGS AND ICE TO POND & SOIL	P	Multi Media Pollution	90
9900015321	26-Mar-00	THUNDER BAY DISTRICT				L	ETHYLENE GLYCOL (ANTIFREEZE)	90	L	WILLIAMS OPERATING CORP- 90L ANTIFREEZE TO GROUND FROM PUNCTURED TRUCK.	P	Soil contamination	50
9900015398	28-Mar-00	THUNDER BAY DISTRICT				L	ORE SLURRY	250	L	BMG-GOLDEN GIANT: 250 L ORE GRINDINGS SLURRY TO SOIL.	N		0
9900015652	5-Apr-00	THUNDER BAY DISTRICT				L	ORE SLURRY	40	L	BMG-GOLDEN GIANT: 40 L PASTE FILL SLURRY TO SOIL, CONTAINED, CLEANING.	N		99
9900015671	6-Apr-00	THUNDER BAY DISTRICT	HYW 102, 0.3KM WEST OF HAZELWOOD			LW	DIESEL FUEL AND WATER MIXTURE	100	L	THUNDER BAY: TRAILER JACK-KNIFED, LEAK IN RUNNING TANK 100L TO GND/CREEK.	P	Soil contamination	75
9900015885	12-Apr-00	THUNDER BAY DISTRICT	KAMINISTIQUIA RIVER.			W	LUBRICANT OIL(LUBE OIL)	1	L	ONTARIO POWER-<1 L LUBE OIL TO RIVER FROM SUMP, TAIL RACE BOOMED.	N		90
9900015961	14-Apr-00	THUNDER BAY DISTRICT	PASS LAKE TRUCK STOP, 17 MILES EAST OF THUNDER BAY ON HWY 17			L	HYDROCARBON LIGHT		UKN	IMPERIAL OIL: H-CARBON CONTAM SOIL AT SERVICE STN.PRESSURE TESTS OK.	C	Soil contamination	0
9900016165	20-Apr-00	THUNDER BAY DISTRICT	CN SIDING IN PENEQUANI.			L	DIESEL FUEL		UKN	CANADAIN PACIFIC RAILWAYS-UNK QUANT DIESEL LEAK TOGROUND & DITCH, CLEANING.	P	Soil contamination	0
9900016404	25-Apr-00	THUNDER BAY DISTRICT				L	WASTEWATER WITH CHLORIDES		UKN	BMG-GOLDEN GIANT: WASTE- WATER OVERFLOW FROM DITCHONTO GROUND NEAR CREEK.	N		0
9900017370	18-May-00	THUNDER BAY DISTRICT	BASE MAP # 491902,LANGWORTHY TWP,LITTLE SAVANNE RIVER WINTER BRIDGE.			W	SILT		UKN	CONTRACTOR-SILT TO RIVER FROM WINTER BRIDGE,MNR.	P	Water course or lake	0
9900017679	26-May-00	THUNDER BAY DISTRICT				L	ORE SLURRY	20	L	GOLDEN GIANT MINE: SPILL OF 20 L ORE SLURRY TO GRND.CONATAINED.	P	Soil contamination	90
9900018225	7-Jun-00	THUNDER BAY DISTRICT	EMPIRE LAKE RD.			L	DIESEL FUEL	135	L	BUCHANAN FOREST PRODUCTS-135 L DIESEL LEAK FROM TANKER/VALVE, CLEANED	C	Soil contamination	99
9900018405	11-Jun-00	THUNDER BAY DISTRICT				L	ORE SLURRY		UNK	BMG-GOLDEN GIANT:A FEW L PASTE FILL SLURRY TO SOIL, CONTAINED, CLEANING.	N		99
9900018488	13-Jun-00	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	68.3	L	WILLIAMS OC-HEMLO MINE: 69.3 L HYDRR OIL TO SOIL ONLY, TO BE EXCAVATED.	P	Water course or lake	0
9900018639	15-Jun-00	THUNDER BAY DISTRICT	HEMLO GOLD MINES INC.			L	WATER		UKN	HEMLO GOLD MINE: RECLAIM WATER TO GROUND. AMOUNT UNKNOWN. CONTAINED/CLEANI	P	Soil contamination	50
9900018788	18-Jun-00	THUNDER BAY DISTRICT				LW	DIESEL FUEL		UKN	CN RAIL: TRAIN DERAILED. NO DANGEROUS GOODS.6 CARS1 LOCOMOTIVE.DIESEL SPILL	P	Water course or lake	0
9900019255	28-Jun-00	THUNDER BAY DISTRICT	MAIN LINE VALVE,30 KM EAST OF UPSALA.			L	DIESEL FUEL	40	L	TRANSCANADA PIPELINES-40 L DIESEL TO GROUND,SEAL FAILURE,CLEANED-UP.	N		99
9900020424	26-Jul-00	THUNDER BAY DISTRICT				L	GRINDING WATER	1	M3	GOLDEN GIANT: 1M3 ORE SLURRY TO COMPANY GROUND,TO SCRAPE UP RESIDUES.	P	Soil contamination	20
9900020484	27-Jul-00	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	10	L	GOLDEN GIANT MINE-10 L HYDR OIL LEAKED TO GROUNDFROM HEAVY EQUIP.CLEANING	N		0

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9900020656	31-Jul-00	THUNDER BAY DISTRICT	WILLIAMS MINE			L	WASTEWATER N.O.S.	200	L	WILLIAMS MINE: CONTAINED SPILL OF 200 L OF PROCESSWASTEWATER - CLEANED	N	Soil contamination	90
9900020767	1-Aug-00	THUNDER BAY DISTRICT	AT THE KASHABOWIE HOTEL			L	DIESEL FUEL	450	L	BUCANNON FOREST PRODUCTS - 450 L OF DIESEL FUEL TOGROUND FROM TRUCK.	C	Soil contamination	100
9900020765	2-Aug-00	THUNDER BAY DISTRICT	WILLIAMS MINE			L	CALCIUM OXIDE (LIME)		UKN	WILLIAMS MINE - UNKNOWN AMOUNT OF LIME TO GROUND FROM DUST COLLECTOR.	N	Other	100
9900021526	21-Aug-00	THUNDER BAY DISTRICT	PORTAGE BAY ROAD IN SHEBANDOWAN			L	HYDRAULIC OIL	15	L	CONSTRUCTION COMPANY-UKN QTY HYDRAULIC OIL TO GRND,TRENCH DUG BY FD.	P	Soil contamination	0
9900021743	26-Aug-00	THUNDER BAY DISTRICT	1-1.5 K WEST OF UPSALA, ON HWY 17			L	CORROSIVE LIQUIDS, FLAMMABLE (N.O.S)		UKN	YANKEE TRANSPORT: UKN QTYD CARGO INCL RADIOACTIVE PKGS IN FIRE.OPP,F/D,ERP.	C	Soil contamination	0
9900022678	10-Sep-00	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			L	MOTOR OIL	1	L	BATTLE MOUNTAIN GOLD MINE1 LITRE MOTOR OIL TO SOILCONTAINED AND CLEANED.	P	Soil contamination	99
9900022734	11-Sep-00	THUNDER BAY DISTRICT	GOLDEN GIANT MINE			W	VARSOL	10	L	10L VARSOL TO SED. POND CONTAINED; TREATED @ EFF. NOT BEING DISCHARGED	P	Water course or lake	
9900022997	14-Sep-00	THUNDER BAY DISTRICT	COMPRESSOR STATION #62, UPSALA			L	OIL (PETROLEUM BASED, NOT SPECIFIED)	80	L	TRANSCANADA PIPELINE: 80 L OIL SPILL TO GRND. CLEANED	P	Soil contamination	99
9900023290	20-Sep-00	THUNDER BAY DISTRICT				L	LUBRICANT OIL(LUBE OIL)	180	L	SPILL 180L LUBRICANT CONTAINED; NO WATER CLEANUP IN PROGRESS	P	Soil contamination	20
9900023621	25-Sep-00	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			L	LIME SLURRY/SLUDGE	2	L	BATTLE MOUNTAIN GOLD MINE1 TO 2 LITRES LIME SLURRYTO GROUND, DRIED UP.	P	Water course or lake	50
9900023776	28-Sep-00	THUNDER BAY DISTRICT	HWY. 527, BETWEEN ARMSTRONG AND OBONGA LAKE.			L	DIESEL FUEL	107	L	GARY DAVIS TRUCKING:107 LDIESEL FUEL TO SOIL. CON -TAINED AND CLEANING.	P	Soil contamination	0
9900024973	19-Oct-00	THUNDER BAY DISTRICT	PIDGEON RIVER BORDER CROSSING			LW	DIESEL FUEL			TRANSPORT TRUCK, SADDLE TANK, UNKNOWN QUANT. LANDCATCH BASIN;	P	Water course or lake	0
9900028871	27-Oct-00	THUNDER BAY DISTRICT	SUMMER BEAVER			L	FUEL (N.O.S.)		UKN	SOURCE UNKNOWN:UKN AMT OF UKN FUEL TO APRON. MTO. (NORTHERN AIRPORT)	P	Soil contamination	0
9900026066	6-Nov-00	THUNDER BAY DISTRICT	NEAR AUDEN TOWN, ON CN RAILWAY			L	DIESEL FUEL	1200	L	CN RAIL: 1200L DIESEL TO GROUND/TRACK - BURST HOSE - CONTAINED.	P	Soil contamination	60
9900026112	6-Nov-00	THUNDER BAY DISTRICT	COMPRESSOR STATION, JELLICOE STN #77			L	HYDRAULIC OIL	50	L	TRANSCANADA PIPELINES: 30-50 L HYDRAULIC OIL TO GROUND.	P	Soil contamination	0
9900026698	16-Nov-00	THUNDER BAY DISTRICT	YELLOW BRICK ROAD \@MARATHON			L	SLURRY (N.O.S.)	10	L	GOLDEN GIANT MINE:SPILL OF 10 L SAND/WATER MIX TO GROUND, CLEANING UP	P	Soil contamination	0
9900027929	11-Dec-00	THUNDER BAY DISTRICT	SHABAQUA CORNERS, JUST WEST OF MATTAWAN RIVER BRIDGE			LW	METHANOL		UNK	CNR:15 CAR DERAILMENT. 3 CARS CARRYING DANGEROUSGOODS.SPILL OF METHANOL.	P	Multi Media Pollution	0
9900029656	20-Jan-01	THUNDER BAY DISTRICT				L	WASTEWATER N.O.S.	400	L	BATTLE MOUNTAIN GOLD: 400 LITRES VACUUM STACK WASH WATER TO GROUND.	P	Soil contamination	0
9900030351	3-Feb-01	THUNDER BAY DISTRICT	CAVERS HILL, HWY 11/17 EAST OF SCHREIBER			L	DIESEL FUEL	800	L	TRANSPORT TRUCK 800L DIESEL FUEL TO HWY;NO WATER SYSTEMS;OPP;FD;MTO	P	Soil contamination	0
9900031114	15-Feb-01	THUNDER BAY DISTRICT	HWY 527, 24 KM NORTH OF HWY 17, NORTH OF THUNDER BAY.			L	DIESEL FUEL	100	L	TRIMAC TRANS: SPILL OF DIESEL (100 L) - RAN OVERSPRING ON HWY. CLEANED.	P	Soil contamination	75
9900031295	20-Feb-01	THUNDER BAY DISTRICT	DOG RIVER, SHELBY ROAD 10 KM WEST OF RAITH			LW	DIESEL FUEL			BOWATER TRUCK: MIN.VOLUME DIESEL FROM SADDLE TANKS - WOOD CHIPS TO RIVER	P	Soil contamination	0
9900031869	2-Mar-01	THUNDER BAY DISTRICT	NIPIGON COMPRESSOR STN 75			L	SYNTHETIC OIL(S) N.O.S.	100	L	TRANSCANADA PIPELINE FAILED STARTER 100L OIL TO GROUND	P	Soil contamination	0
9900031940	3-Mar-01	THUNDER BAY DISTRICT	RED ROCK, LAKE SUPERIOR IS IMPACTED WATER BODY			L	WOOD		UKN	CP RAIL 58 CAR DERAILMENT NO HAZARDOUS SPILL LUMBER INTO L. SUPERIOR	P	Water course or lake	0
9900032418	13-Mar-01	THUNDER BAY DISTRICT	NIPIGON; LAKE HELEN INDIAN RESERVE			L	DIESEL FUEL	15	L	LAKE HELEN IND. RES. 15L DYED DIESEL TO GROUND CONTAINED CLEANED	N		90
9900032772	20-Mar-01	THUNDER BAY DISTRICT	SCHRIEBER HWY 17 100 METRES WEST OF OPP STATION			L	MOTOR OIL	30	L	TRANSPORT TRUCK MOTOR OIL TO GROUND 30L	P	Soil contamination	0
9900034492	17-Apr-01	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			L	TAILINGS	20	L	BATTLE MOUNTAIN GOLD MINE-20L TAILINGS TO GROUND CLEANED UPL	P	Multi Media Pollution	90
9900035266	26-Apr-01	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			L	DIESEL FUEL	10	L	BATTLE MOUNTAIN GOLD MI- NE-10 L DIESEL TO GROUND FROM OVERFILLED TK,CLEAND	C	Soil contamination	90
9900035363	27-Apr-01	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE NEAR MARATHON			L	LEACHABLE TOXIC WASTE		UKN	BATTLE MOUNTAIN GOLD MI- NE-TAILINGS LEACHATE LEA-KING OUT OF CEMENT BERM	C	Soil contamination	0
9900036839	17-May-01	THUNDER BAY DISTRICT	PAYS PLAT CREEK AT PAYS PLAT FIRST NATIONS, 34 KN N W OF SCHREIBER HWY 17			LW	DIESEL FUEL		UKN	DAY/ROSS: MVA, DIESEL SPILL TO L. SUPERIOR. OPP, EMO, EPS, FIRE DEPT.	C	Water course or lake	0
9900037863	1-Jun-01	THUNDER BAY DISTRICT	UPSALA			WL	DIESEL FUEL	150	L	UPSALA FOREST PRODUCTS TRUCK 150L DIESEL FUEL TO ROAD RIVER	P	Water course or lake	0
9900038777	8-Jun-01	THUNDER BAY DISTRICT	ADMINISTRATION BUILDING			A	REFRIGERANT GAS, N.O.S.	54	KG	SPILL:MAX 54 KG OF FREON (GENETRON 22)TO AIR NOTIC-ED TODAY FROM A/C UNIT	P		0

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9900039166	14-Jun-01	THUNDER BAY DISTRICT	YELLOW BRICK ROAD			L	SLURRY (N.O.S.)		UKN	BATTLE MOUNTAIN GOLD-UKN QTY "FEED OFF MILLS" TO DITCHES TO CATCH POND.	N		0
9900039634	19-Jun-01	THUNDER BAY DISTRICT	LOGGING ROAD 405-01, THUNDER BAY DISTRICT			L	HYDRAULIC OIL	50	L	DOMTAR:50 L OF HYDRAULIC OIL TO GROUND, CONTAINED&CLEANING.	P	Soil contamination	0
9900042719	26-Jul-01	THUNDER BAY DISTRICT	ADMINISTRATION BUILDING			A	FREON R-22 (CFC)		UNK	GOLDEN GIANT MINE: UKN AMOUNT OF FREON (GENETRON 22) TO AIR.	P	Air Pollution	0
9900043483	3-Aug-01	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE			L	ORE SLURRY	40	L	BATTLE MOUNTAIN GOLD MINE-40L SLURRY TO GROUND NEAR MAIN DOOR.	P	Multi Media Pollution	0
9900044107	8-Aug-01	THUNDER BAY DISTRICT	NELL PARK SITE			W	CREOSOTE		UKN	THUNDER BAY: REPORTED TO CCG-SARNIA, CREOSOTE TO WATER, CONTAINING	C	Water course or lake	25
9900046158	1-Sep-01	THUNDER BAY DISTRICT	LAC LACROIX SCHOOL, LAC LACROIX FIRST NATIONS COMMUNITY.			L	FURNACE OIL		UKN	LAC LACROIX FIRST NATIONSSCHOOL-UNK QUANT FURNACE OIL ONTO GRND, EPS.	C	Soil contamination	0
9900047393	18-Sep-01	THUNDER BAY DISTRICT	THE NORTH WEST COMPANY SITE IN ATTAWAPISKAT ON SHORE OF JAMES BAY			L	FUEL OIL	450	L	NORTHWEST COMPANY:450 L FUEL OIL TO GROUND FROM ABOVE GROUND TANK	C	Multi Media Pollution	0
9900047488	19-Sep-01	THUNDER BAY DISTRICT	HOCKEY RINK LOCATED IN BIG TROUT LAKE			L	FUEL OIL	15	L	BIG TROUT LAKE HOCKEY RINK:15 L FUEL OIL TO RINK, GROUND, CLEANING	C	Soil contamination	0
9900047783	23-Sep-01	THUNDER BAY DISTRICT	VEHICLE ACCIDENT NEAR THUNDER BAY			L	DIESEL FUEL	150	L	VEHICLE ACCIDENT CAUSING SEMI TO SPILL 150L DIESEL FROM SADDLE TANKS	P	Soil contamination	0
9900048370	1-Oct-01	THUNDER BAY DISTRICT	NEWMONT CANADA GOLD MINE			L	WASTE SLURRY	2	L	NEWMONT MINE:2L SLURRY SPILL TO GRD. CONTAINED CLEANING THIS MORNING	P	Soil contamination	0
9900049136	11-Oct-01	THUNDER BAY DISTRICT	CREEK AT KM 16 OF DIRECT RD, WEST OF NORTH RD (0.5MILE S OF HWY 17)			WL	USED MOTOR OIL	32	LIT	UPSALA FOREST PRODUCTS- TRUCK-27-32L OF MOTOR OILTO ROCKS & CREEK.CLEANING	C	Water course or lake	25
9900049918	22-Oct-01	THUNDER BAY DISTRICT	DUNC LAKE OFF HWY 17.			W	DIESEL FUEL			REIMER EXPRESS-DIESEL TO LAKE FROM TRUCK,CARGO OF DANGEROUS GOODS.	P	Multi Media Pollution	0
9900049930	22-Oct-01	THUNDER BAY DISTRICT				LW	TAILINGS		UKN	LAC DES ISLE MINE-UKN QTYTAILINGS TO GRND AND POND,SEEPAGE THROUGH DAM.	P	Multi Media Pollution	0
9900050113	24-Oct-01	THUNDER BAY DISTRICT	TRESTLE OVER CEDAR CREEK.			L	TAILINGS	2	L	BATTLE MOUNTAIN GOLD-2 L RE-CLAIM WATER TO CREEK FROM LINE.	P	Multi Media Pollution	90
9900051335	9-Nov-01	THUNDER BAY DISTRICT	BUSH CAMP,30 KM NORTHWEST OF THUNDER BAY ON DOG LAKE ROAD,CONC 4,LAPPE.			L	DIESEL FUEL	100	L	BUCHANAN FOREST PROD-100 L FUEL OIL TO GROUND, VANDALISM,CLEANED-UP	P	Soil contamination	0
9900051575	13-Nov-01	THUNDER BAY DISTRICT	HYDRO ONE RIGHT-OF-WAY NEAR HIGHWAY 628, RED ROCK CORNERS			L	HYDRAULIC OIL	20	L	HYDRO ONE: BACKHOE, 20L HYDRAULIC FLUID TO GROUND, NO WATER, CLEANED UP	P	Human health	95
9900051918	19-Nov-01	THUNDER BAY DISTRICT				W	TAILINGS		UNK	LAC DES ILES MINES: 3HOUR TAILINGS RELEASE TO THE SOUTH STARTER POND.	P	Water course or lake	0
9900052574	28-Nov-01	THUNDER BAY DISTRICT	NEMONTS GOLDEN GIANT MINE, YELLOW BRICK ROAD, MARATHON			L	DIESEL FUEL	200	L	NEMONTS GOLDEN GIANT MINE 200L DIESEL TO GROUND, CONTAINED AND CLEANED	P	Soil contamination	99
9900052737	30-Nov-01	THUNDER BAY DISTRICT	HWY 17 5 KM EAST OF SHABAQUA, MVA INVOLVING SEVERAL TRANSPORTS.			L	PCB-CONTAMINATED OIL (>50PPM PCB)		UKN	TRANS-CYCLE INDUSTRIES MVA, PCB WASTE DRUMS TO ROAD, FD, OPP, MOE.	P	Soil contamination	0
9900052791	30-Nov-01	THUNDER BAY DISTRICT	ARMSTRONG			L	DIESEL FUEL	200	L	PAUL'S HAULAGE: 200 L DIESEL TO GROUND, LOOKINGFOR CONTRACTOR NO CONTAIN	P	Soil contamination	0
9900053077	5-Dec-01	THUNDER BAY DISTRICT	HWY 11 & 17, 1 KM EAST OF BYLUNDS PIT ROAD (NEAR SHADAQUA)			L	DIESEL FUEL	800	L	NEIL BIRKETT & SONS: 400L DIESEL TO GROUND, OPP & FD ON SCENE	P	Soil contamination	0
9900053162	6-Dec-01	THUNDER BAY DISTRICT	10920 JOHN ST. ROAD \@MURILLO, ON			L	DIESEL FUEL		UNK	PRIVATE RESIDENCE:UNKNOWN VOLUME OF HEATING FUEL TO GROUND.	P	Soil contamination	0
9900053228	6-Dec-01	THUNDER BAY DISTRICT	PETRO CANADA--MISSION ISLAND, 300 106 STREET			L	DIESEL FUEL	10	L	PETRO CANADA: 10L DIESEL TO GROUND, NO WATER, CLEANED UP	P	Soil contamination	95
9900054608	2-Jan-02	THUNDER BAY DISTRICT	ATIKOKAN TGS			LW	SEWAGE SLUDGE	UKN		ATIKOKAN TGS -SPILL OF SEWAGE BETWEEN PLANT AND SEWAGE LAGOON.	P	Multi Media Pollution	
9900054640	3-Jan-02	THUNDER BAY DISTRICT	GULL BAY RESERVE			W	SEWAGE,RAW UNCHLORINATED		UKN	GULL BAY RESERVE: UNKNOWN AMOUNT OF RAW SEWAGE TO LAKE NIPIGON.	P	Water course or lake	0
9900054711	4-Jan-02	THUNDER BAY DISTRICT	TCPL COMPRESSOR STN #84 KLOTZ LAKE PARCEL # 13971 UNSURVEYED TERRITORY.			L	HYDRAULIC OIL	70	L	TRANSCANADA PIPELINES: 70 L HYDRAULIC OIL TO GRND. NO WATER.	P	Soil contamination	80
9900055589	21-Jan-02	THUNDER BAY DISTRICT	CAMP 45 ROAD, KM MARKER 56			L	DIESEL FUEL	200	L	PYE FUELS: 200L DIESEL TO GROUND, ALL CLEANED UP, AIR ELIMINATOR PROBLEM	P	Soil contamination	95
9900055738	24-Jan-02	THUNDER BAY DISTRICT	BATTLE MOUNTAIN GOLD, BOMBAY TWP., NEAR MARATHON TREATED WATER			L	TAILINGS RUN OFF WATER	200	LIT	GOLDEN GIANT MINE: SPILL OF 200L RECLEAN WATER, ONTO GROUND	P	Soil contamination	0
9900055780	25-Jan-02	THUNDER BAY DISTRICT	CP RAIL NEAR BREMNER \@13 MILES WEST OF WHITE RIVER			L	POTASH (POTASSIUM CHLORIDE)		UNK	CP RAIL:30 CAR DERAILMENT UNKN AMOUNT POTASH TO GRND, WATER COARSES UNKN	P	Soil contamination	0
9900056041	29-Jan-02	THUNDER BAY DISTRICT	LOGGING ROAD ON THE WEST SIDE OF LAKE NIPIGON			W	DIESEL FUEL		UKN	BUCHANAN-SMALL QTY DIESELTO CREEK,LOGGING MACHINE FELL OFF TRAILER.	N		0
9900056176	1-Feb-02	THUNDER BAY DISTRICT	POND #1-DOUG LAKE SYSTEM HEADWATERS, NEWLY CONSTRUCTED TAILINGINS POND/DAM			LW	TAILINGS		UKN	NA PALLADIUM: 900 L/MIN RELEASE OF TAILINGS FROM DAM, TO SURFACE WATER.	P	Multi Media Pollution	0

Table H-4
Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9900056326	4-Feb-02	THUNDER BAY DISTRICT	LONGHOUSE VILLAGE TRAILER PARK \@LAKESHORE DRIVE			L	SEWAGE,RAW UNCHLORINATED		UKN	LONGHOUSE VILLAGE: SEWAGE SPILL, UKN QUANTITY, TO GROUND, CLEANING UP	P	Soil contamination	50
9900057385	23-Feb-02	THUNDER BAY DISTRICT	10 KM EAST OF NIPIGON ON HIGHWAY 17.			L	DIRTY WATER (SUSPENDED SOLIDS/SAND)	UKN		TRANSPORT TRUCK: FIRE WATER TO DITCH. EMERG. CREWS ON SCENE.	P	Soil contamination	95
9900057639	27-Feb-02	THUNDER BAY DISTRICT				L	TAILINGS		UKN	LAC DES ILES MINE-UKN QTYTAILINGS TO GROUND FROM LEAK IN DAM.	P	Soil contamination	0
9900057679	28-Feb-02	THUNDER BAY DISTRICT	50 KM S OF GULL BAY FIRST NATIONS (NNE OF THUNDER BAY)			L	HYDRAULIC OIL	300	L	NIIGAANI ENTERPRISES:300L HYDRAULIC OIL TO GND FROM DROPPED TANK.CLEAN'G	P	Soil contamination	80
9900059142	4-Apr-02	THUNDER BAY DISTRICT	THE NORTH WEST COMPANY SITE IN ATTAWAPISKAT ON SHORE OF JAMES BAY			L	FUEL OIL		UKN	NORTHWEST COMPANY-UKN QTYFURNACE OIL TO GRND,2 EVENTS.	C	Multi Media Pollution	0
9900059425	14-Apr-02	THUNDER BAY DISTRICT	HWY 11, NEAR ORIENT BAY(20-30 KM NORTHEAST OF NIPIGON.			L	DIESEL FUEL	800	LIT	TRANS-X TRANSPORT TRUCK RUPTURED FUEL TANK,FD ATTENDED, OIL TO WATER.	P	Multi Media Pollution	0
9900059439	15-Apr-02	THUNDER BAY DISTRICT				W	TAILINGS RUN OFF WATER		UKN	GOLDEN GIANT MINE: OVER- FLOW FROM TAILINGS LINE; PLANNED RELEASE.SAMPLING.	P	Water course or lake	0
9900061850	27-May-02	THUNDER BAY DISTRICT	HWY 17, 50 KM WEST OF UPSALA PYRAMID TOWNSHIP			L	DIESEL FUEL		UKN	IRINA TRUCK LINE:TRUCK WENT INTO DITCH BOTH FUEL TANKS RUPTURED.	P	Multi Media Pollution	0
9900061884	28-May-02	THUNDER BAY DISTRICT	HWY 17 OUTSIDE OF MARATHON TOWARDS WHITE RIVER			L	FUEL (N.O.S.)	300	L	UNKNOWN:300L OF DIESEL TO DITCH, NO OTHER INFO AVAILABLE AT THIS TIME.	P	Soil contamination	0
9900062690	5-Jun-02	THUNDER BAY DISTRICT	ATTAWATISKAT AIRPORT BETWEEN FUEL STORAGE TANK & AIR CREEBEC PLANE.			L	AVIATION FUEL (JET A OR B, TURBO)	45	L	AIR CREEBEC-45 L JET FUELONTO GRAVEL/APRON @ ATTA-WATISKAT AIRPORT. MTO.	C	Soil contamination	50
9900063113	11-Jun-02	THUNDER BAY DISTRICT				L	GRINDING WATER		UKN	BATTLE MOUNTAIN GOLD-UKN QTY GRINDING WATER TO GRND AND PONDS.	N		0
9900063352	13-Jun-02	THUNDER BAY DISTRICT	TAILINGS MANAGEMENT FACILITY HWY 527, 120 KM NORTH OF THUNDER BAY			L	TAILINGS		UKN	LAC DES ILES MINE-UKN QTY-SEEPAGE FROM TALINGS DAM.	P	Soil contamination	0
9900063357	13-Jun-02	THUNDER BAY DISTRICT	TBCSB ST. IGNATIOUS SCHOOL 285 GIBSON AVENUE, THUNDER BAY			L	OIL (PETROLEUM BASED, NOT SPECIFIED)	20-45	L	ST.IGNATIOUS SCHOOL: SPILL OF OIL TO GROUND CONTAINED & CLEANING	P	Soil contamination	0
9900064331	21-Jun-02	THUNDER BAY DISTRICT	BRIGHT SANDS FOREST,SHIKAG EAST.			L	HYDRAULIC OIL	120	L	BUCHANAN FOREST-120 L HYDRAULIC OIL TO GRND, CLEANUP UNDERWAY.	C	Soil contamination	0
9900064643	24-Jun-02	THUNDER BAY DISTRICT	GOLDEN GIANT MINE - YELLOWBRICK RD.			L	ETHYLENE GLYCOL (ANTIFREEZE)	4	GAL	GOLDEN GIANT MINE: SPILL 4 GAL OF ANTIFREEZE TO ASHPHALT	P	Soil contamination	100
9900064891	26-Jun-02	THUNDER BAY DISTRICT	BAWK (RAIL POINT), BURROWS LAKE, HALF WAY BETWEEN LONGLAC AND NAKINA			W	HYDRAULIC OIL	45	GAL	CN RAIL-45 L HYDRAULIC OIL TO BRIDGE & STREAM, HOSE FAILED ON BOOM TRUCK	P	Water course or lake	0
9900065962	4-Jul-02	THUNDER BAY DISTRICT				L	LUBRICATING OIL/GREASE	410	L	LAC DES ISLE MINE-410 L GEAR OIL DUMPED INTO GARBAGE DUMP.	P	Multi Media Pollution	0
9900066054	5-Jul-02	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	30	LIT	WILLIAMS OC-HEMLO MINE: 20-30 L HYDRAULIC OIL TO ASPHALT,CONTAINED,CLEAND	N	Water course or lake	95
9900066056	5-Jul-02	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	300	LIT	WILLIAMS OC-HEMLO MINE: 300 L HYDRAULIC OIL TO LAND.CONTAINED,CLEANING	N	Water course or lake	95
9900067577	18-Jul-02	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE			L	TREATED EFFLUENT (N.O.S.)		UKN	BATTLE MOUNTAIN GOLD MINE-UKN QUANT. OF EFFLUENT TO GROUND.	P	Soil contamination	0
9900072083	24-Aug-02	THUNDER BAY DISTRICT	KASHISHIBOG LAKE.			W	AVIATION FUEL (JET A OR B, TURBO)		UKN	HOLINSHEAD LAKE OUTFITTER-PLANE CRASH,INJURIES,UNKQUANT FUEL/OIL TO LAKE.	C	Water course or lake	0
9900072428	28-Aug-02	THUNDER BAY DISTRICT				L	HYDRAULIC OIL	200	LIT	WILLIAMS OC-HEMLO MINE: 200 L HYDRAULIC OIL TO PIT.CONTAINED,CLEANING.	N	Soil contamination	10
9900072737	30-Aug-02	THUNDER BAY DISTRICT	EAST OF THE KASABONIKA AIRPORT ON THE KASIBONIKA FIRST NATIONS RESERVE.			LW	AVIATION FUEL (JET A OR B, TURBO)	400	LIT	DE BEERS: SPILL OF JET B FUEL TO MARSHY BOGGY AREA OF THE RESERVE.	P	Multi Media Pollution	95
9900073066	3-Sep-02	THUNDER BAY DISTRICT	TRANSCANADA PIPELINE RIGHT-OF-WAY, BEARDMORE			L	HYDRAULIC OIL	2	L	TRANSCANADA PIPELINES: 2 L HYDRAULIC OIL TO GROUND. CLEANED.	P	Soil contamination	99
9900073084	3-Sep-02	THUNDER BAY DISTRICT	AT THE BATTLE MOUNTAIN GOLDEN GIANT MINE			L	PROCESS WATER (NOT OTHERWISE SPECIFIED)	500	LIT	GOLDEN GIANT: 500 L OF PROCESS WATER TO PAD, CONTAINED, CLEANING.	P	Soil contamination	0
9900073816	9-Sep-02	THUNDER BAY DISTRICT	ODOKI AIRPORT (500KM NNE OF THUNDER BAY)			L	FUEL OIL		UKN	PRIVATE OWNER: POSSIBLE FUEL LEAK FROM STORAGE TANKS.	C	Soil contamination	0
9900074624	16-Sep-02	THUNDER BAY DISTRICT	YELLOW BRICK ROAD, MARATHON\@GOLDEN GIANT MINE			L	WASTE OIL	120	L	GOLDEN GIANT MINE: 120L WASTE OIL TO GROUND, BEING CLEANED UP	P	Soil contamination	50
9900075101	20-Sep-02	THUNDER BAY DISTRICT	GOLDEN GIANT MINE, MILL BUILDING, YELLOW BRICK RD, MARATHON			A	MERCURY			GOLDEN GIANT MINE:HIGH MERCURY LEVELS INDOORS VENTING TO ATMOSPHERE	P	Air Pollution	0
9900075760	28-Sep-02	THUNDER BAY DISTRICT	MILL RD & HWY 17\@TERRACE BAY			L	RESIN SOLUTION	100	LIT	RSB LOGISTICS: 100 L OF FIBERGLASS RESIN TO LOT FROM DRUM LEAK ON TRUCK	P	Soil contamination	90
9900076046	1-Oct-02	THUNDER BAY DISTRICT	20 KM N. ON WHINSTON MINE RD. AT END OF RD.			LW	HYDRAULIC OIL	3	L	SUPERIOR NORTH PATH CONS. 3 L HYDRAULIC OIL-GRND CLEANED UP	P	Soil contamination	99

Table H-4
Thunder Bay - Spills Database

ORIS #	DATE	Mun Name	Location	Easting	Northing	Medium	Material	Quantity	Units	Synopsis	Impact	Nature of Impact	Cleanup %
9900076715	8-Oct-02	THUNDER BAY DISTRICT	OPP DETACHMENT-SHABAQUA, HWY 1117 SHABAQUA			L	SEWAGE,RAW UNCHLORINATED		UNK	UNKNOWN AMOUNT OF SEWAGE TO CATCH BASIN AND DITCH. CONTAINED ONSITE SO FAR	P	Water course or lake	0
9900076960	10-Oct-02	THUNDER BAY DISTRICT	JU CALONEGO CONSTRUCTION 685 BEAVER HALL PLACE			L	ETHYLENE GLYCOL (ANTIFREEZE)	200	LIT	J.U. CALONEGO: APPROX 200L OF WING DEICING FLUID. SPILL CLEANED	P	Soil contamination	99
9900077756	20-Oct-02	THUNDER BAY DISTRICT	3 KM ALONG KITCHEN RD, RT OF HWY 8/11, 140 KM OFF HWY 527			L	DIESEL FUEL	225	L	BUCHANAN - 225 L DIESEL TO HWY WHEN TRUCK HIT GRA-DER ON HWY. CLEANING.	N		99
9900078066	24-Oct-02	THUNDER BAY DISTRICT	KM 57 OGOKI RD 50 KM WEST OF AROLAND			L	PETROLEUM DISTILLATES (N.O.S.)		UKN	PYE FUELS:UNKNOWN QTY OF DISTILLATES TO GRD FROM TANKER,UNK WATERCOARSES	P	Soil contamination	0

Table H-5
Thunder Bay - PCB Sites

						HIGH LEVEL PCBs (>1000 ppm)															LOW LEVEL PCBs (<1000 ppm)									
SITE NUMBER	COMPANY	ADDRESS1	ADDRESS2	CITY	POSTAL CODE	Weight Bulk Liquid (L)	Weight of Liquid in Transformer	No. Transformers	No. Drums of Ballasts	Weight of drums of Ballasts (Kg)	Cal. Weight of drums of ballasts (kg)	No. Capacitors	Weight of Capacitors (Kg)	No. Drums of Soil	Weight of drums of soil (Kg)	Cal. Weight of drums of soil (Kg)	No. soil not in drums (Kg)	No. Drums of other material	Weight of drums of other material (Kg)	Cal. Weight of drums of other material (Kg)	Weight of other material (not in drums) (Kg)	Weight of Bulk Liquid (L)	Weight of Liquid in Transformer (Kg)	No. Transformers	No. Drums of Soil	Weight of Drums of Soil (Kg)	Cal. Weight of drums of soil (Kg)	Weight of Soil (not in drums) (Kg)	No. Drums of other material	Weight of drums of other material (Kg)	Cal. Weight of drums of other soil (Kg)	Weight of other material (not in drums) (Kg)
60185A005	ONTARIO HYDRO - LAKEHEAD T.S.	LAKEHEAD TRANSFORMER STATION	LAKESHORE DRIVE	THUNDER BAY	P7B 5E4	0	0			0		1	15		0		0		0		0	862	0			0		0	0	0	0	0
60186A009	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY	P7A 4K2	4514	9597.48	77	4	0	800	6		11	0	4400	0	32	0	4800	14.536	8868.21		23		0		0		0		0
60188A201	ABITIBI-PRICE - THUNDER BAY DIV.	P.O. BOX 2510	SOUTH END OF MILL YARD TOWARDS PROV.MILL	THUNDER BAY	P7B 5E9	8523.75	47.7	7		0		134	0	54	0	21600	0	2	0	300	10	4962	601.55	9		0		0	7	0	1050	0
60188A202	BAZIUK RAIL INC.		359 BURBIDGE STREET	THUNDER BAY	P7B 5R3	0	0			0			0		0		0		0		0	0	0			0		0		0		0
60188A204	AVENOR INC.	LOCATION 5 - WOODROOM B (NORTH SUB STN)	NEEBING AVENUE	THUNDER BAY	P7C4W3	0	0	1		0			0		0		0		0		0	0	0			0		0		0		0
60188A205	AVENOR INC.	LOCATION 2 - B MILL DIGESTER AREA	NEEBING AVENUE	THUNDER BAY	P7E4E3	230	0		9	0	1800		0		0		0	3	0	450	0	0	0			0		0		0		0
60188A208	AVENOR INC.	WAFERBOARD STORAGE COMPOUND	NEEBING AVENUE	THUNDER BAY	P7C4W3	50005	0	14	46	0	9200	5	0		0		0	4	0	600	0	0	0			0		0		0		0
60188A232	PORT ARTHUR SHIPBUILDING CO.	ELECTRICAL SUBSTATION	BOX 2690	THUNDER BAY	P7B5G2	0	0			0		30	216.45		0		0		0		0	0	4446	8		0		0	1	0	150	0
60189A001	ONTARIO HYDRO - BURWOOD ROAD		205 BURWOOD RD.	THUNDER BAY	P7C 4W4	0	0			0			0		0		0		0		0	0	0			0		0		0		0
60190A002	MINISTRY OF TRANSPORTATION	MTO DISTRICT YARD	615 SOUTH JAMES STREET	THUNDER BAY	P7C 4X9	0	0			0			0		0		0		0		0	0	0			0		0		0		0
60190A003	MANAGEMENT BOARD SECRETARIAT	THUNDER BAY CORRECTIONAL CENTRE	HIGHWAY 61 WEST OF THUNDER BAY	THUNDER BAY	P7C 4Y4	0	0			0			0		0		0		0		0	0	0			0		0		0		0
60191A006	ONTARIO HYDRO - BURWOOD ROAD	ONTARIO HYDRO	205 BURWOOD ROAD , LARGE SHED	THUNDER BAY, ONTARIO	P7C 4W4	0	0		1	0	200	23	23		0		0		0		0	5985	430	23		0		0	4	0	600	0
60192A001	THUNDER BAY, CORPORATION OF THE CITY OF	901 ATLANTIC AVENUE	WATER POLLUTION CONTROL PLANT	THUNDER BAY	P7E 5V3	1595	0		73	0	14600		0		0		0	3	0	450	0	0	0			0		0	1	0	150	0
60193A003	THUNDER BAY TERMINALS LTD.	MCKELLAR ISLAND	SE CORNER OF TB TERMINALS PROPERTY	THUNDER BAY	P7C5J7	0	0			0			0		0		0		0		0	0	0			0		0		0		0
60193A004	PORT ARTHUR GENERAL HOSPITAL	EAST ANNEX MUNRO STREET	460 NORTH COURT STREET	THUNDER BAY	P7A 4X6	0	0			0		12	0		0		0		0		0	0	120	1		0		0	1	0	150	0
60193A005	LAKEHEAD BOARD OF EDUCATION	108TH AVENUE		THUNDER BAY		0	0			0			0		0		0		0		0	0	0			0		0		0		0
60194A001	AVENOR INC.	SULPHITE MILL VAULT	NEEBING AVENUE	THUNDER BAY, ONTARIO	P7C4W3	0	0	2		0			0		0		0		0		0	0	0			0		0		0		0

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON2208800	1140661 ONTARIO LIMITED	545 8TH AVENUE		THUNDER BAY	333772	5364639	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER SERVICES
ON1614600	733434 ONTARIO	LOT 3, CONC 5		LYBSTER TWP			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	SCHOOL BUS OPER.
ON1256500	856595 ONTARIO LTD	LOTS 35-38	MAIN STREET	THUNDER BAY			S	PCB WASTE	PCB'S	ENGINEER OFFICES
ON0392101	988424 ONTARIO INC.	PARTS LOTS 11 & 12, CONC. 1 NKR &	PART LOT 12, CONC. 1 NKR	PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	DOMESTIC CLAY PROD.
ON0392101	988424 ONTARIO INC.	PARTS LOTS 11 & 12, CONC. 1 NKR &	PART LOT 12, CONC. 1 NKR	PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	DOMESTIC CLAY PROD.
ON0947400	A & (OUT OF BUS) 01-230		402 KINGSTON ST.	THUNDER BAY	330527	5359007	L	CORROSIVE	ACID WASTE - HEAVY METALS	OTHER MECH. SPEC.
ON1560000	A TO Z (SEE & USE ON0452500) 02-609	946 COBALT CRESCENT		THUNDER BAY	332980	5364316	L	IGNITABLE	PETROLEUM DISTILLATES	IND. MACH. RENTAL
ON1560000	A TO Z (SEE & USE ON0452500) 02-609	946 COBALT CRESCENT		THUNDER BAY	332980	5364316	L	IGNITABLE	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ON1560000	A TO Z (SEE & USE ON0452500) 02-609	946 COBALT CRESCENT		THUNDER BAY	332980	5364316	L	IGNITABLE	LIGHT FUELS	IND. MACH. RENTAL
ON1996500	A&T PRECISION GRINDING	918 ALLOY DRIVE		THUNDER BAY	333338	5364402	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	MACHINE SHOP IND.
ON1573200	A. KURIKKA LOGGING 02-623	LOT 57 B HWY 61, CROOKS TWP	MUN.OF NEEBING, C/O R.R.#7	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON1740600	A.J. WING & SONS CONST.	815 HAROLD CRESENT		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTRTUCTION EQUIP.
ON1740600	A.J. WING & SONS CONST.	815 HAROLD CRESENT		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	CONSTRTUCTION EQUIP.
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)		PAIPOONGE TWP.			L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	OTHER UTILITY IND.
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)		PAIPOONGE TWP.			L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	OTHER UTILITY IND.
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)		PAIPOONGE TWP.			L	HAZARDOUS INDUSTRIAL WASTE	HEAVY FUELS	OTHER UTILITY IND.
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)		PAIPOONGE TWP.			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER UTILITY IND.
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)		PAIPOONGE TWP.			L	IGNITABLE	LIGHT FUELS	OTHER UTILITY IND.
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)		PAIPOONGE TWP.			L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	OTHER UTILITY IND.
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)		PAIPOONGE TWP.			L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	OTHER UTILITY IND.
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)		PAIPOONGE TWP.			L	LEACHATE TOXIC	TRANSFER STATION OILS WASTES	OTHER UTILITY IND.
ON0008602	ABITIBI (SEE & USE ON1741900)	PROVINCIAL PAPERS DIVISION	P.O. BOX 2450, MARINE DRIVE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OTHER SPECIFIED INORGANICS	OTHER PAPER IND.
ON0008602	ABITIBI (SEE & USE ON1741900)	PROVINCIAL PAPERS DIVISION	P.O. BOX 2450, MARINE DRIVE	THUNDER BAY			L	PCB WASTE	PCB'S	OTHER PAPER IND.
ON0008602	ABITIBI (SEE & USE ON1741900)	PROVINCIAL PAPERS DIVISION	P.O. BOX 2450, MARINE DRIVE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER PAPER IND.
ON0008602	ABITIBI (SEE & USE ON1741900)	PROVINCIAL PAPERS DIVISION	P.O. BOX 2450, MARINE DRIVE	THUNDER BAY			L	IGNITABLE	WASTE OILS & LUBRICANTS	OTHER PAPER IND.
ON0008610	ABITIBI-PRICE INC	NW INTERSECTION HWYS 811 & 527	CAMP GARAGE 230, FMA 500700	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	LOGGING INDUSTRY
ON0008610	ABITIBI-PRICE INC	NW INTERSECTION HWYS 811 & 527	CAMP GARAGE 230, FMA 500700	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	LIQUID INDUSTRIAL WASTE	POLYMERIC RESINS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	LEACHATE TOXIC	INORGANIC LABORATORY CHEMICALS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	S	REACTIVE	INORGANIC LABORATORY CHEMICALS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	S	REGISTERABLE SOLID WASTE	INORGANIC LABORATORY CHEMICALS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	IGNITABLE	LIGHT FUELS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	S	REGISTERABLE SOLID WASTE	POLYMERIC RESINS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	LIQUID INDUSTRIAL WASTE	OTHER POLYMERIC WASTES	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	S	REGISTERABLE SOLID WASTE	OTHER POLYMERIC WASTES	NEWSPRINT INDUSTRY

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	IGNITABLE	HALOGENATED PESTICIDES	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	PCB WASTE	PCB'S	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	IGNITABLE	WASTE OILS & LUBRICANTS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	IGNITABLE	PETROLEUM DISTILLATES	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	CORROSIVE	ORGANIC ACIDS	NEWSPRINT INDUSTRY
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		THUNDER BAY	335602	5356646	L	CORROSIVE	AMINES	NEWSPRINT INDUSTRY
ON0008609	ABITIBI-PRICE INC.	FIELD SERVICE GARAGE, CAMP 11	HARVESTING OPERATIONS, OFF HWY 527	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008609	ABITIBI-PRICE INC.	FIELD SERVICE GARAGE, CAMP 11	HARVESTING OPERATIONS, OFF HWY 527	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	LOGGING INDUSTRY
ON0008608	ABITIBI-PRICE INC.	NW INTERSECTION HWY 527 & 11/17	CENTRAL GARAGE, TOWNSHIP OF SHUNIAH	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	LOGGING INDUSTRY
ON0008608	ABITIBI-PRICE INC.	NW INTERSECTION HWY 527 & 11/17	CENTRAL GARAGE, TOWNSHIP OF SHUNIAH	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	LOGGING INDUSTRY
ON0008608	ABITIBI-PRICE INC.	NW INTERSECTION HWY 527 & 11/17	CENTRAL GARAGE, TOWNSHIP OF SHUNIAH	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OTHER SPECIFIED ORGANICS	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	IGNITABLE	AROMATIC SOLVENTS	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	HALOGENATED SOLVENTS	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	PCB WASTE	PCB'S	NEWSPRINT INDUSTRY
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE		THUNDER BAY			L	CORROSIVE	OIL SKIMMINGS & SLUDGES	NEWSPRINT INDUSTRY
ON1780300	ACZ CONTRACTORS LIMITED	349 MOONEY STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	HIGHWAYS, STR., ETC.
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	S	HAZARDOUS INDUSTRIAL WASTE	INORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	CORROSIVE	ACID WASTE - HEAVY METALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	CORROSIVE	ACID WASTE - OTHER METALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	FOR MANIFEST, SPECIFIC GRAVITY	ALKALINE WASTES - OTHER METALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	S	CORROSIVE	ALKALINE WASTES - OTHER METALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	CORROSIVE	ALKALINE PHOSPHATES	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	S	LEACHATE TOXIC	INORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	FOR MANIFEST, SPECIFIC GRAVITY	ALIPHATIC SOLVENTS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	IGNITABLE	PETROLEUM DISTILLATES	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	IGNITABLE	POLYMERIC RESINS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED PESTICIDES	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	FOR MANIFEST, SPECIFIC GRAVITY	INORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	PCB WASTE	PCB'S	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	FOR MANIFEST, SPECIFIC GRAVITY	ORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	IGNITABLE	GRAPHIC ART WASTES	CEREAL GRAIN FLOUR
ON0999602	ADM/OGILVIE, DIV. OF	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	ACUTELY HAZARDOUS WASTE CHEM.	NON-HALOGENATED PESTICIDES	CEREAL GRAIN FLOUR
ON0023004	AIR CANADA	201 ROUND BOULEVARD		THUNDER BAY	328868	5360136	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SCHED. AIR TRANSPORT
ON0023005	AIR CANADA	THUNDER BAY AIRPORT,100 PRINCESS STREET	AIR CANADA AIRPORT SERVICES	THUNDER BAY	328856	5360297	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	SCHED. AIR TRANSPORT
ON0005004	AIR ONTARIO INC.	200 ROUND BLVD	THUNDER BAY AIRPORT	THUNDER BAY	328852	5360138	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	SCHED. AIR TRANSPORT
ON0005004	AIR ONTARIO INC.	200 ROUND BLVD	THUNDER BAY AIRPORT	THUNDER BAY	328852	5360138	L	IGNITABLE	LIGHT FUELS	SCHED. AIR TRANSPORT
ON0018102	ALBRIGHT & WILSON (SEE&USE ON1606300)	1535 CITY ROAD		THUNDER BAY			S	REGISTERABLE SOLID WASTE	BRINES, CHLOR-ALKALI WASTES	IND. INORGANIC CHEM.
ON0018102	ALBRIGHT & WILSON (SEE&USE ON1606300)	1535 CITY ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	BRINES, CHLOR-ALKALI WASTES	IND. INORGANIC CHEM.
ON0018102	ALBRIGHT & WILSON (SEE&USE ON1606300)	1535 CITY ROAD		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	IND. INORGANIC CHEM.
ON0018102	ALBRIGHT & WILSON (SEE&USE ON1606300)	1535 CITY ROAD		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	IND. INORGANIC CHEM.
ON0018102	ALBRIGHT & WILSON (SEE&USE ON1606300)	1535 CITY ROAD		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	HALOGENATED SOLVENTS	IND. INORGANIC CHEM.
ON0018102	ALBRIGHT & WILSON (SEE&USE ON1606300)	1535 CITY ROAD		THUNDER BAY			S	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	IND. INORGANIC CHEM.
ON0018102	ALBRIGHT & WILSON (SEE&USE ON1606300)	1535 CITY ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. INORGANIC CHEM.
ON0018102	ALBRIGHT & WILSON (SEE&USE ON1606300)	1535 CITY ROAD		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	IND. INORGANIC CHEM.
ON0321900	ALGOMA PARK ANIMAL CLINIC	109 SOUTH ALGOMA STREET		THUNDER BAY	335249	5366860	S	PATHOLOGICAL	PATHOLOGICAL WASTES	VETERINARY SERVICE
ON2124700	ANCLIFFE TIMBER LTD.	LOT 15, CONC 1		PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST SERVICES
ON1840300	ANGUS W BROWN	414 E BROCK STREET		THUNDER BAY	332587	5359671	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON2066600	ARCTURUS ENVIRONMENTAL LTD.	230 NORTH CUMBERLAND		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER SERVICES
ON0112001	ARGUS NEWSPAPER	955 OLIVER ROAD		THUNDER BAY			L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	NEWSPAPER, ETC. IND.
ON0112001	ARGUS NEWSPAPER	955 OLIVER ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	NEWSPAPER, ETC. IND.
ON0471300	ARMSTRONG VAN & STORAGE LIMITED	66 FRONT STREET		THUNDER BAY	336549	5367771	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	USED GOODS MOV./ST.
ON0258705	ARMTEC INC.	RR #2, HIGHWAY #17 WEST		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER STAMPED METAL
ON0446900	ARNONE TRANSPORT LIMITED 03-081	300 SOUTH WATER NORTH		THUNDER BAY	335414	5366343	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0735802	ATLAS TESTING LABS & SERVICES	883ALLOY PLACE		THUNDER BAY	333436	5364715	S	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	OTHER SCI./TECH. OF.
ON0735802	ATLAS TESTING LABS & SERVICES	883ALLOY PLACE		THUNDER BAY	333436	5364715	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	OTHER SCI./TECH. OF.
ON0458604	ATWAY TRANSPORT INC.	2781 HIGHWAY #17		PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST PROD. TRUCK.
ON0227202	AVIS RENT-A-CAR/TRUCK	1475 WEST WALSH STREET		THUNDER BAY	329415	5360287	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON0419300	B&B (OUT OF BUS) 04-052		859 FORT WILLIAM ROAD	THUNDER BAY	334207	5363817	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	CONCRETE PIPE IND.
ON0392100	B.J. HALOW & SON CONSTRUCTORS LTD.43-016	LOT 20, CONCESSION 3, PART LOT 20		PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST PROD. TRUCK.
ON1404600	B.P. RESOURCES CANADA LIMITED 05-584	1173 ROLAND STREET		THUNDER BAY	333019	5363375	L	LIQUID INDUSTRIAL WASTE	HALOGENATED SOLVENTS	SERVICE -MINING
ON0306900	BALMORAL VETERINARY (OUT OF BUSINESS)	955 COBALT CRESCENT		THUNDER BAY	333077	5364268	S	PATHOLOGICAL	PATHOLOGICAL WASTES	VETERINARY SERVICE
ON2163000	BAYTEC FLUID POWER LIMITED	556 TENTH AVENUE		THUNDER BAY	333682	5364555	L	HAZARDOUS INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER MACHINERY

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1073000	BAZIUK RAIL INC. 08-450	359 BURBIDGE ST.		THUNDER BAY	334471	5364245	S	PCB WASTE	PCB'S	RAILWAY TRANS. SERV.
ON0859200	BEARSKIN AIRLINES	216 ROUND BLVD.	HANGAR #2	THUNDER BAY	328863	5360156	L	IGNITABLE	PETROLEUM DISTILLATES	SCHED. AIR TRANSPORT
ON0859200	BEARSKIN AIRLINES	216 ROUND BLVD.	HANGAR #2	THUNDER BAY	328863	5360156	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	SCHED. AIR TRANSPORT
ON0470700	BEATRICE FOODS INC. 04-068	134 SOUTH WATERLOO STREET		THUNDER BAY	332408	5361324	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	FLUID MILK IND.
ON0470700	BEATRICE FOODS INC. 04-068	134 SOUTH WATERLOO STREET		THUNDER BAY	332408	5361324	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FLUID MILK IND.
ON0033955	BELL CANADA	229 SOUTH VICKERS STREET		THUNDER BAY	333297	5361137	S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	TELECOMMUN. CARRRIERS
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	L	IGNITABLE	PETROLEUM DISTILLATES	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	L	CORROSIVE	ACID WASTE - HEAVY METALS	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	S	CORROSIVE	ALKALINE WASTES - HEAVY METALS	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	L	IGNITABLE	LIGHT FUELS	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	S	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	G	HAZARDOUS WASTE CHEMICAL	WASTE COMPRESSED GASES	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	G	IGNITABLE	WASTE COMPRESSED GASES	GARAGES(GEN. REPAIR)
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		THUNDER BAY	330000	5361002	S	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	GARAGES(GEN. REPAIR)
ON0344000	BILOSKI BROS. SAND GRAVEL LTD.	ONION LAKE ROAD	PART MINING LOCATION 2, CONCESSION 1	GORHAM TOWNSHIP			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SAND & GRAVEL PITS
ON1277401	BIOCAN ONTARIO 864-226 LTD. 05-372	882 ALLOY PLACE, UNIT 2		THUNDER BAY	333349	5364717	S	PATHOLOGICAL	PATHOLOGICAL WASTES	DENTISTS, SPEC., OFF.
ON0898100	BJ EQUIPMENT RENTALS LTD.	250 DOG LAKE ROAD		THUNDER BAY	328453	5373268	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ON1338104	BLACK PHOTO CORPORATION	1000 FORT WILLIAM ROAD		THUNDER BAY	333925	5363558	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON1338104	BLACK PHOTO CORPORATION	1000 FORT WILLIAM ROAD		THUNDER BAY	333925	5363558	L	CORROSIVE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON1338104	BLACK PHOTO CORPORATION	1000 FORT WILLIAM ROAD		THUNDER BAY	333925	5363558	L	FOR MANIFEST, SPECIFIC GRAVITY	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON1338104	BLACK PHOTO CORPORATION	1000 FORT WILLIAM ROAD		THUNDER BAY	333925	5363558	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074387	BLACK PHOTO CORPORATION	1020 DAWSON ROAD		THUNDER BAY	333431	5369023	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074387	BLACK PHOTO CORPORATION	1020 DAWSON ROAD		THUNDER BAY	333431	5369023	L	FOR MANIFEST, SPECIFIC GRAVITY	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074387	BLACK PHOTO CORPORATION	1020 DAWSON ROAD		THUNDER BAY	333431	5369023	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074387	BLACK PHOTO CORPORATION	1020 DAWSON ROAD		THUNDER BAY	333431	5369023	L	CORROSIVE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074396	BLACK PHOTO CORPORATION	KESKUS MALL	230 PARK STREET	THUNDER BAY	335698	5366978	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074396	BLACK PHOTO CORPORATION	KESKUS MALL	230 PARK STREET	THUNDER BAY	335698	5366978	L	FOR MANIFEST, SPECIFIC GRAVITY	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074396	BLACK PHOTO CORPORATION	KESKUS MALL	230 PARK STREET	THUNDER BAY	335698	5366978	L	CORROSIVE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074396	BLACK PHOTO CORPORATION	KESKUS MALL	230 PARK STREET	THUNDER BAY	335698	5366978	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074391	BLACK PHOTO CORPORATION	VICTORIA MALL	125 SYNDICATE AVENUE	THUNDER BAY	333606	5361358	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074391	BLACK PHOTO CORPORATION	VICTORIA MALL	125 SYNDICATE AVENUE	THUNDER BAY	333606	5361358	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074391	BLACK PHOTO CORPORATION	VICTORIA MALL	125 SYNDICATE AVENUE	THUNDER BAY	333606	5361358	L	FOR MANIFEST, SPECIFIC GRAVITY	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0074391	BLACK PHOTO CORPORATION	VICTORIA MALL	125 SYNDICATE AVENUE	THUNDER BAY	333606	5361358	L	CORROSIVE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0036106	BLACKWOOD HODGE (OUT OF BUSINESS)	399 MEMORIAL AVENUE		THUNDER BAY	334630	5365891	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	IND. MACH. RENTAL
ON0036106	BLACKWOOD HODGE (OUT OF BUSINESS)	399 MEMORIAL AVENUE		THUNDER BAY	334630	5365891	L	IGNITABLE	PETROLEUM DISTILLATES	IND. MACH. RENTAL
ON0036106	BLACKWOOD HODGE (OUT OF BUSINESS)	399 MEMORIAL AVENUE		THUNDER BAY	334630	5365891	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ONF029800	BLAKE FUNERAL CHAPEL LIMITED 44-298		200 SOUTH MAY STREET	THUNDER BAY	333766	5361226	L	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES
ONF029800	BLAKE FUNERAL CHAPEL LIMITED 44-298		200 SOUTH MAY STREET	THUNDER BAY	333766	5361226	S	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ONF029800	BLAKE FUNERAL CHAPEL LIMITED 44-298		200 SOUTH MAY STREET	THUNDER BAY	333766	5361226	L	FOR MANIFEST, SPECIFIC GRAVITY	PATHOLOGICAL WASTES	FUNERAL HOMES
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	HAZARDOUS WASTE CHEMICAL	AROMATIC SOLVENTS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	IGNITABLE	PETROLEUM DISTILLATES	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	IGNITABLE	LIGHT FUELS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	HAZARDOUS WASTE CHEMICAL	POLYMERIC RESINS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	PCB WASTE	PCB'S	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	S	PATHOLOGICAL	PATHOLOGICAL WASTES	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	LIQUID INDUSTRIAL WASTE	ALKALINE WASTES - OTHER METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	LIQUID INDUSTRIAL WASTE	ACID WASTE - OTHER METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	FOR MANIFEST, SPECIFIC GRAVITY	ALKALINE WASTES - HEAVY METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	FOR MANIFEST, SPECIFIC GRAVITY	ACID WASTE - HEAVY METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	S	HAZARDOUS INDUSTRIAL WASTE	ALKALINE WASTES - HEAVY METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	CORROSIVE	ACID WASTE - HEAVY METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	FOR MANIFEST, SPECIFIC GRAVITY	ALKALINE WASTES - OTHER METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	LIQUID INDUSTRIAL WASTE	ALKALINE PHOSPHATES	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	S	HAZARDOUS INDUSTRIAL WASTE	NEUTRALIZED WASTES - HEAVY METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	FOR MANIFEST, SPECIFIC GRAVITY	PAINT/PIGMENT/COATING RESIDUES	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	LIQUID INDUSTRIAL WASTE	ALKALINE WASTES - OTHER METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	L	HAZARDOUS INDUSTRIAL WASTE	ALKALINE WASTES - HEAVY METALS	OTHER TRANS. EQUIP.
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		THUNDER BAY	329586	5358748	S	LEACHATE TOXIC	PAINT/PIGMENT/COATING RESIDUES	OTHER TRANS. EQUIP.
ON0652215	BOT (OUT OF BUS) 04-398	HWY 11/17 FROM BALSAM ST. EASTERLY TO	CURRENT RIVER BRIDGE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTRTUCTION EQUIP.
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	S	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	PCB WASTE	PCB'S	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	S	PATHOLOGICAL	PATHOLOGICAL WASTES	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LIQUID INDUSTRIAL WASTE	PETROLEUM DISTILLATES	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	G	HAZARDOUS INDUSTRIAL WASTE	WASTE COMPRESSED GASES	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	IGNITABLE	ALIPHATIC SOLVENTS	PULP INDUSTRY

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LIQUID INDUSTRIAL WASTE	LANDFILL LEACHATES	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	S	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	IGNITABLE	LIGHT FUELS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	CORROSIVE	ACID WASTE - HEAVY METALS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	S	CORROSIVE	ALKALINE WASTES - HEAVY METALS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	PULP INDUSTRY
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	PULP INDUSTRY
ON1856301	BOWATER PULP & PAPER CANADA INC.	S.E. SECTOR OF THUNDER BAY , ADJACENT TO	DND RIFLE RANGE (MT. MCKAY LANDFILL)	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	LANDFILL LEACHATES	PULP INDUSTRY
ON0433800	BRITEWAY CLEANERS & LAUNDERERS LTD06-077		1543 ARTHUR STREET	THUNDER BAY			S	IGNITABLE	PETROLEUM DISTILLATES	POWER LAUND./CLEANERS
ON0040005	BROWNING-FERRIS (OUT OF BUSINESS) LTD.	566 11TH AVENUE		THUNDER BAY	333658	5364454	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	BULK DRY TRUCKING
ON0040005	BROWNING-FERRIS (OUT OF BUSINESS) LTD.	566 11TH AVENUE		THUNDER BAY	333658	5364454	L	IGNITABLE	PETROLEUM DISTILLATES	BULK DRY TRUCKING
ON0040005	BROWNING-FERRIS (OUT OF BUSINESS) LTD.	566 11TH AVENUE		THUNDER BAY	333658	5364454	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	BULK DRY TRUCKING
ON0040016	BROWNING-FERRIS INDUSTRIES	122 COOPER ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	BULK DRY TRUCKING
ON0040016	BROWNING-FERRIS INDUSTRIES	122 COOPER ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	BULK DRY TRUCKING
ON0040016	BROWNING-FERRIS INDUSTRIES	122 COOPER ROAD		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	BULK DRY TRUCKING
ON0476501	BRUNO'S CONTRACTING (THUNDER BAY)LIMITED	MAPLEWARD ROAD PIT AREA		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	WRECKING & DEMO.
ON0476500	BRUNO'S CONTRACTING, THUNDER BAY LTD	665 HEWITSON STREET		THUNDER BAY	333183	5363804	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	WRECKING & DEMO.
ON0476500	BRUNO'S CONTRACTING, THUNDER BAY LTD	665 HEWITSON STREET		THUNDER BAY	333183	5363804	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	WRECKING & DEMO.
ON1452604	BUCHANAN NORTHERN HARDWOODS	10TH SIDE ROAD		PAIPOONGE TWP.			L	IGNITABLE	PETROLEUM DISTILLATES	SAWMILL & PLANING
ON1452604	BUCHANAN NORTHERN HARDWOODS	10TH SIDE ROAD		PAIPOONGE TWP.			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SAWMILL & PLANING
ON1452604	BUCHANAN NORTHERN HARDWOODS	10TH SIDE ROAD		PAIPOONGE TWP.			L	IGNITABLE	LIGHT FUELS	SAWMILL & PLANING
ON0537101	BULK SYSTEMS ONTARIO LTD	937 ALLOY DRIVE		THUNDER BAY	333419	5364259	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	BULK LIQ. TRUCKING
ON0537101	BULK SYSTEMS ONTARIO LTD	937 ALLOY DRIVE		THUNDER BAY	333419	5364259	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	BULK LIQ. TRUCKING
ON1254400	C. POIRIER (OUT OF BUSINESS) 09-364	1570 DAWSON RD.		THUNDER BAY	331198	5370471	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ONA900247	C/A CONDITION REQUIREMENT	CARRIER-BIOCAN WASTE MANAGEMT. SYSTEMS	509 N. EDWARD STREET	THUNDER BAY	331430	5362727	S	PATHOLOGICAL	PATHOLOGICAL WASTES	OTHER SERVICES
ONA900247	C/A CONDITION REQUIREMENT	CARRIER-BIOCAN WASTE MANAGEMT. SYSTEMS	509 N. EDWARD STREET	THUNDER BAY	331430	5362727	S	FOR MANIFEST, SPECIFIC GRAVITY	PHARMACEUTICALS	OTHER SERVICES
ON1686201	CALLAWAY CHEMICAL LIMITED	1020 PACIFIC AVENUE		THUNDER BAY	335683	5362706	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	OTHER CHEM. PROD.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1686201	CALLAWAY CHEMICAL LIMITED	1020 PACIFIC AVENUE		THUNDER BAY	335683	5362706	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER CHEM. PROD.
ON1200000	CAMBRIAN (OUT OF BUS) 08-547	RR #1, 1473 ROSSLYN ROAD		THUNDER BAY	327712	5359265	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER SERVICES
ON1200000	CAMBRIAN (OUT OF BUS) 08-547	RR #1, 1473 ROSSLYN ROAD		THUNDER BAY	327712	5359265	L	LIQUID INDUSTRIAL WASTE	INERT INORGANIC WASTES	OTHER SERVICES
ON1200003	CAMBRIAN VACUUM CORPORATION	101-103 RUBIN DRIVE		OLIVER & PAIPOONGE TOWNSHIP			L	LIQUID INDUSTRIAL WASTE	INERT INORGANIC WASTES	ELECTRICAL HH. APP.
ON1200003	CAMBRIAN VACUUM CORPORATION	101-103 RUBIN DRIVE		OLIVER & PAIPOONGE TOWNSHIP			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELECTRICAL HH. APP.
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		THUNDER BAY	335246	5364906	L	IGNITABLE	LIGHT FUELS	MALT & MALT FLOUR
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		THUNDER BAY	335246	5364906	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	MALT & MALT FLOUR
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		THUNDER BAY	335246	5364906	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	MALT & MALT FLOUR
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		THUNDER BAY	335246	5364906	L	IGNITABLE	PETROLEUM DISTILLATES	MALT & MALT FLOUR
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		THUNDER BAY	335246	5364906	S	PCB WASTE	PCB'S	MALT & MALT FLOUR
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		THUNDER BAY	335246	5364906	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	MALT & MALT FLOUR
ON0044339	CANADA POST CORPORATION	THUNDER BAY MAIL PROCESSING PLANT	1005 ALLOY DRIVE	THUNDER BAY	333035	5364102	S	PCB WASTE	PCB'S	OTHER GEN. ADMIN.
ON0008406	CANADIAN (SEE & USE ON1268901)	MAIN DOG RIVER ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			S	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	CORROSIVE	ALKALINE WASTES - OTHER METALS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			S	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	LANDFILL LEACHATES	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	IGNITABLE	ALIPHATIC SOLVENTS	PULP INDUSTRY
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	PCB WASTE	PCB'S	PULP INDUSTRY

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0008400	CANADIAN (SEE & USE ON1856302)	(CORNER OF NEEBING & BROADWAY AVENUES)		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	PULP INDUSTRY
ON0269109	CANADIAN BLOOD SERVICES	1165 BARTON STREET		THUNDER BAY	332794	5363418	S	PATHOLOGICAL	PATHOLOGICAL WASTES	OTHER NON-INST. SERV.
ON0196508	CANADIAN COAST GUARD	RABBIT MOUNTAIN	MARLWOOD ROAD	THUNDER BAY			S	PCB WASTE	PCB'S	REGION. PLAN./DEV.
ON0196502	CANADIAN COAST GUARD BASE	KEEFER TERMINAL	100 MAIN STREET	THUNDER BAY	335663	5364015	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	REGULATORY SERV.
ON0196502	CANADIAN COAST GUARD BASE	KEEFER TERMINAL	100 MAIN STREET	THUNDER BAY	335663	5364015	L	IGNITABLE	PETROLEUM DISTILLATES	REGULATORY SERV.
ON0196502	CANADIAN COAST GUARD BASE	KEEFER TERMINAL	100 MAIN STREET	THUNDER BAY	335663	5364015	L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	REGULATORY SERV.
ON0196502	CANADIAN COAST GUARD BASE	KEEFER TERMINAL	100 MAIN STREET	THUNDER BAY	335663	5364015	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	REGULATORY SERV.
ON0196502	CANADIAN COAST GUARD BASE	KEEFER TERMINAL	100 MAIN STREET	THUNDER BAY	335663	5364015	L	HAZARDOUS INDUSTRIAL WASTE	LIGHT FUELS	REGULATORY SERV.
ON1321500	CANADIAN FRONTIER 08-682	310 HECTOR DOUGALL WAY		THUNDER BAY	328387	5360107	L	IGNITABLE	LIGHT FUELS	AIRCRAFT SEVICING
ON1321500	CANADIAN FRONTIER 08-682	310 HECTOR DOUGALL WAY		THUNDER BAY	328387	5360107	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	AIRCRAFT SEVICING
ON1321500	CANADIAN FRONTIER 08-682	310 HECTOR DOUGALL WAY		THUNDER BAY	328387	5360107	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	AIRCRAFT SEVICING
ON1939900	CANADIAN LAKEHEAD EXHIBITION	425 NORTHERN AVENUE		THUNDER BAY	333947	5362977	L	IGNITABLE	PAINT/PIGMENT/COATING RESIDUES	OTHER AMUSE./REC.
ON1939900	CANADIAN LAKEHEAD EXHIBITION	425 NORTHERN AVENUE		THUNDER BAY	333947	5362977	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER AMUSE./REC.
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	RAILWAY TRANS. IND.
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	LIGHT FUELS	RAILWAY TRANS. IND.
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	RAILWAY TRANS. IND.
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	RAILWAY TRANS. IND.
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	RAILWAY TRANS. IND.
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP	THUNDER BAY			L	PCB WASTE	PCB'S	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	IGNITABLE	OIL SKIMMINGS & SLUDGES	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	PHENOLIC WASTES	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			S	LEACHATE TOXIC	HEAVY FUELS	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	CORROSIVE	ALKALINE WASTES - HEAVY METALS	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALKALINE WASTES - OTHER METALS	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			S	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	RAILWAY TRANS. IND.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	LEACHATE TOXIC	PAINT/PIGMENT/COATING RESIDUES	RAILWAY TRANS. IND.
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	RAILWAY TRANS. IND.
ON0048122	CANADIAN PACIFIC (SEE & USE ON0048113)	DIESEL SHOP	MCNAUGHTON STREET & MCDONALD STREET	THUNDER BAY			L	CORROSIVE	ALKALINE WASTES - OTHER METALS	RAILWAY TRANS. IND.
ON0048122	CANADIAN PACIFIC (SEE & USE ON0048113)	DIESEL SHOP	MCNAUGHTON STREET & MCDONALD STREET	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	RAILWAY TRANS. IND.
ON0048122	CANADIAN PACIFIC (SEE & USE ON0048113)	DIESEL SHOP	MCNAUGHTON STREET & MCDONALD STREET	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	RAILWAY TRANS. IND.
ON0048184	CANADIAN PACIFIC (SEE & USE ON1890811)	1510 DAWSON ROAD		THUNDER BAY	331443	5370381	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	GEN. FREIGHT TRUCK.
ON0048184	CANADIAN PACIFIC (SEE & USE ON1890811)	1510 DAWSON ROAD		THUNDER BAY	331443	5370381	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	GEN. FREIGHT TRUCK.
ON0008410	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	OPERATING UNIT #602 - SOUTH ALLELY LAKE	MAIN GRAHAM RD, 36 MILES N FROM HWY 17	DISTRICT OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008404	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	OPERATING UNIT 45/MAIN BLACK STURGEON RD	10 MILES NORTHEAST OF HWY 527	DISTRICT OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008411	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	OPERATING UNIT 603 LITTLE SPARKLING		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008411	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	OPERATING UNIT 603 LITTLE SPARKLING		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	LOGGING INDUSTRY
ON0008413	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	WOODLADS GARAGE -HWY 17 (ARTHUR ST)	1/4 MILE WEST OF 25TH SIDEROAD	PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008413	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	WOODLADS GARAGE -HWY 17 (ARTHUR ST)	1/4 MILE WEST OF 25TH SIDEROAD	PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	LOGGING INDUSTRY
ON0008413	CANADIAN PACIFIC FOREST PRODUCTS LIMITED	WOODLADS GARAGE -HWY 17 (ARTHUR ST)	1/4 MILE WEST OF 25TH SIDEROAD	PAIPOONGE			L	IGNITABLE	PETROLEUM DISTILLATES	LOGGING INDUSTRY
ON0008408	CANADIAN PACIFIC FOREST PRODUCTS LTD	BASKET LAKE 20 MILES NORTH OF HWY 17		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0008407	CANADIAN PACIFIC FOREST PRODUCTS LTD	OPERATING UNIT #517	MYRT LAKE, 50 MILES WEST FROM HWY 590	DISTRICT OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0048123	CANADIAN PACIFIC LIMITED	C.P. RAIL STATION - THUNDER BAY	440 SOUTH SYNDICATE AVENUE	THUNDER BAY	333603	5360787	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	RAILWAY TRANS. IND.
ON0048123	CANADIAN PACIFIC LIMITED	C.P. RAIL STATION - THUNDER BAY	440 SOUTH SYNDICATE AVENUE	THUNDER BAY	333603	5360787	L	IGNITABLE	PETROLEUM DISTILLATES	RAILWAY TRANS. IND.
ON0048123	CANADIAN PACIFIC LIMITED	C.P. RAIL STATION - THUNDER BAY	440 SOUTH SYNDICATE AVENUE	THUNDER BAY	333603	5360787	L	IGNITABLE	LIGHT FUELS	RAILWAY TRANS. IND.
ON0048123	CANADIAN PACIFIC LIMITED	C.P. RAIL STATION - THUNDER BAY	440 SOUTH SYNDICATE AVENUE	THUNDER BAY	333603	5360787	L	IGNITABLE	OIL SKIMMINGS & SLUDGES	RAILWAY TRANS. IND.
ON0048123	CANADIAN PACIFIC LIMITED	C.P. RAIL STATION - THUNDER BAY	440 SOUTH SYNDICATE AVENUE	THUNDER BAY	333603	5360787	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	RAILWAY TRANS. IND.
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	RAILWAY TRANS. IND.
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22	THUNDER BAY			L	CORROSIVE	ACID WASTE - HEAVY METALS	RAILWAY TRANS. IND.
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22	THUNDER BAY			L	CORROSIVE	ALKALINE WASTES - HEAVY METALS	RAILWAY TRANS. IND.
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22	THUNDER BAY			L	CORROSIVE	ALKALINE WASTES - OTHER METALS	RAILWAY TRANS. IND.
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22	THUNDER BAY			S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	RAILWAY TRANS. IND.
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	RAILWAY TRANS. IND.
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	RAILWAY TRANS. IND.
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22	THUNDER BAY			S	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	RAILWAY TRANS. IND.
ON2177600	CANADIAN WEARPARTS LIMITED	963 ALLOY DRIVE		THUNDER BAY	333416	5364218	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	OTHER MACHINERY
ON0348400	CARGILL LIMITED	DARREL AVENUE (MISSION ROAD)	TERMINAL ELEVATOR	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	OTHER CROP SERVICE
ON0348400	CARGILL LIMITED	DARREL AVENUE (MISSION ROAD)	TERMINAL ELEVATOR	THUNDER BAY			L	PCB WASTE	PCB'S	OTHER CROP SERVICE
ON0348400	CARGILL LIMITED	DARREL AVENUE (MISSION ROAD)	TERMINAL ELEVATOR	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	OTHER CROP SERVICE
ON0348400	CARGILL LIMITED	DARREL AVENUE (MISSION ROAD)	TERMINAL ELEVATOR	THUNDER BAY			L	CORROSIVE	OIL SKIMMINGS & SLUDGES	OTHER CROP SERVICE

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ON0348400	CARGILL LIMITED	DARREL AVENUE (MISSION ROAD)	TERMINAL ELEVATOR	THUNDER BAY			L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	OTHER CROP SERVICE
ON0348400	CARGILL LIMITED	DARREL AVENUE (MISSION ROAD)	TERMINAL ELEVATOR	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER CROP SERVICE
ON0206906	CASE CANADA (SEE & USE ON1930700)	655 MOUNTDALE AVENUE		THUNDER BAY	329964	5360623	L	IGNITABLE	PETROLEUM DISTILLATES	CONSTR./FOREST. MACH.
ON0206906	CASE CANADA (SEE & USE ON1930700)	655 MOUNTDALE AVENUE		THUNDER BAY	329964	5360623	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTR./FOREST. MACH.
ON0206906	CASE CANADA (SEE & USE ON1930700)	655 MOUNTDALE AVENUE		THUNDER BAY	329964	5360623	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	CONSTR./FOREST. MACH.
ON0506100	CASTAGNES ROCKS & MINERALS 09-082	LOT 13, FRANCIS SURVEY - MCGREGOR TWP.	BOX 2594	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OTHER INORGANIC ACID WASTES	OTHER NON-METAL MINE
ON0738728	CENTRA (SEE & USE ON0178276)	1230 CARRICK STREET		THUNDER BAY	333353	5363219	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GAS DISTIRB. SYS.
ON0738728	CENTRA (SEE & USE ON0178276)	1230 CARRICK STREET		THUNDER BAY	333353	5363219	S	CORROSIVE	ALKALINE WASTES - HEAVY METALS	GAS DISTIRB. SYS.
ON0738728	CENTRA (SEE & USE ON0178276)	1230 CARRICK STREET		THUNDER BAY	333353	5363219	L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	GAS DISTIRB. SYS.
ON0738728	CENTRA (SEE & USE ON0178276)	1230 CARRICK STREET		THUNDER BAY	333353	5363219	L	HAZARDOUS WASTE CHEMICAL	HALOGENATED SOLVENTS	GAS DISTIRB. SYS.
ON0738728	CENTRA (SEE & USE ON0178276)	1230 CARRICK STREET		THUNDER BAY	333353	5363219	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	GAS DISTIRB. SYS.
ON0738728	CENTRA (SEE & USE ON0178276)	1230 CARRICK STREET		THUNDER BAY	333353	5363219	S	REGISTERABLE SOLID WASTE	INERT INORGANIC WASTES	GAS DISTIRB. SYS.
ON0738727	CENTRA (SEE & USE ON0178277)	PART OF MINING LOCATION 23 A		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GAS DISTIRB. SYS.
ON0738729	CENTRA (SEE & USE ON0178279)	PART OF LOT 7, CONCESSION 3		GORHAM TWP.			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GAS DISTIRB. SYS.
ON0287906	CHAMPION ROAD MACHINERY SALES	975 WEST WALSH STREET		THUNDER BAY	329881	5360518	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER MACHINERY
ON2112000	CHARLES KORTE TRUCKING	1134 JOHN STREET ROAD		THUNDER BAY	332372	5368238	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER TRUCK./TRANS.
ON1171900	CLARA INDUSTRIAL SERVICES LTD	1130 COMMERCE STREET		THUNDER BAY	329821	5360214	L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	GARAGES(GEN. REPAIR)
ON1171900	CLARA INDUSTRIAL SERVICES LTD	1130 COMMERCE STREET		THUNDER BAY	329821	5360214	L	HAZARDOUS WASTE CHEMICAL	AROMATIC SOLVENTS	GARAGES(GEN. REPAIR)
ON1171900	CLARA INDUSTRIAL SERVICES LTD	1130 COMMERCE STREET		THUNDER BAY	329821	5360214	L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	GARAGES(GEN. REPAIR)
ON1171900	CLARA INDUSTRIAL SERVICES LTD	1130 COMMERCE STREET		THUNDER BAY	329821	5360214	L	IGNITABLE	PETROLEUM DISTILLATES	GARAGES(GEN. REPAIR)
ON1171900	CLARA INDUSTRIAL SERVICES LTD	1130 COMMERCE STREET		THUNDER BAY	329821	5360214	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GARAGES(GEN. REPAIR)
ON1561900	CLOW DARLING LTD. 07-424	1201 CAMERON STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GARAGES(GEN. REPAIR)
ON1561900	CLOW DARLING LTD. 07-424	1201 CAMERON STREET		THUNDER BAY	333096	5362061	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GARAGES(GEN. REPAIR)
ON0952700	COLOR-PRO 11-323		1184 ROLAND ST.	THUNDER BAY	332942	5363313	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0868502	CONFEDERATION COLLEGE	2160 ROUND BLVD.	MOFFAT HANGER, THUNDER BAY AIRPORT	THUNDER BAY	328697	5360052	L	IGNITABLE	PETROLEUM DISTILLATES	POST-SEC. NON-UNIV.
ON0868500	CONFEDERATION COLLEGE 11-278	510 WIEBEN CRESCENT	HANGARII, THUNDER BAY AIRPORT	THUNDER BAY	328599	5359771	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	POST-SEC. NON-UNIV.
ON0868500	CONFEDERATION COLLEGE 11-278	510 WIEBEN CRESCENT	HANGARII, THUNDER BAY AIRPORT	THUNDER BAY	328599	5359771	L	IGNITABLE	PETROLEUM DISTILLATES	POST-SEC. NON-UNIV.
ON0868501	CONFEDERATION COLLEGE OF	THUNDER BAY CAMPUS, ENCIRCLED BY	GULF LINK RD/BELMORAL ST/WILLIAM ST.	THUNDER BAY	332088	5363578	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POST-SEC. NON-UNIV.
ON0868501	CONFEDERATION COLLEGE OF	THUNDER BAY CAMPUS, ENCIRCLED BY	GULF LINK RD/BELMORAL ST/WILLIAM ST.	THUNDER BAY	332088	5363578	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	POST-SEC. NON-UNIV.
ON0868501	CONFEDERATION COLLEGE OF	THUNDER BAY CAMPUS, ENCIRCLED BY	GULF LINK RD/BELMORAL ST/WILLIAM ST.	THUNDER BAY	332088	5363578	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	POST-SEC. NON-UNIV.
ON0868501	CONFEDERATION COLLEGE OF	THUNDER BAY CAMPUS, ENCIRCLED BY	GULF LINK RD/BELMORAL ST/WILLIAM ST.	THUNDER BAY	332088	5363578	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	POST-SEC. NON-UNIV.
ON0868501	CONFEDERATION COLLEGE OF	THUNDER BAY CAMPUS, ENCIRCLED BY	GULF LINK RD/BELMORAL ST/WILLIAM ST.	THUNDER BAY	332088	5363578	L	CORROSIVE	GRAPHIC ART WASTES	POST-SEC. NON-UNIV.
ON0472100	CONMEE, TOWNSHIP OF	3RD CONCESSION ROAD, LOT 1		CONMEE TWP.			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0417600	CONTRACTORS CLEAN UP SERVICES LTD 11-076		349 MOONEY STREET	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	FOREST PROD. TRUCK.
ON0987200	COPYTROX LIMITED 11-345		782 MACDONELL STREET	THUNDERBAY	333894	5364896	L	IGNITABLE	PETROLEUM DISTILLATES	DUPLICATING SERV.
ON1967600	CORPORATE GRAPHICS NORTHEAST INC.	270 SOUTH ALGOMA STREET		THUNDER BAY	334816	5366365	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	PLATEMAKING, ETC.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1967600	CORPORATE GRAPHICS NORTHEAST INC.	270 SOUTH ALGOMA STREET		THUNDER BAY	334816	5366365	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	PLATEMAKING, ETC.
ON0321901	CROSSROADS ANIMAL CLINIC	RR #2		THUNDER BAY			S	PATHOLOGICAL	PATHOLOGICAL WASTES	VETERINARY SERVICE
ON1892605	CTI CONSTRCUTION EQUIPMENT INC.	PT. OF LOT 3, CONC. 2, N. OF KAM RIVER	PLAN 55R9813, LOT 1, (ARTHUR ST. W.)	PAIPOONGE TOWNSHIP			L	IGNITABLE	PETROLEUM DISTILLATES	CONSTR./FOREST. MACH.
ON1892605	CTI CONSTRCUTION EQUIPMENT INC.	PT. OF LOT 3, CONC. 2, N. OF KAM RIVER	PLAN 55R9813, LOT 1, (ARTHUR ST. W.)	PAIPOONGE TOWNSHIP			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTR./FOREST. MACH.
ON0441200	CUMBERLAND WASH N DRY	191 N. CUMBERLAND STREET		THUNDER BAY	336377	5367662	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POWER LAUND./CLEANERS
ON0421700	CUSTOM (OUT OF BUS) 11-079		1045B GORHAM STREET	THUNDER BAY	333724	5363833	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	MACHINE SHOP IND.
ON0421701	CUSTOM HYDRAULICS LIMITED	1100 LITHIUM DRIVE		THUNDER BAY	333066	5364989	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	MACHINE SHOP IND.
ON0902100	D&R EQUIPMENT RENTAL & SALES	LOT 7 & 8, CONC 2		PAIPOONGE TWP			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	EQUIP. RENTAL W. OP.
ON1925700	DAYCON MECHANICAL SYSTEMS LTD.	1820 BAILEY AVENUE		THUNDER BAY	330269	5358915	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	OTHER FAB. STRUCTURES
ON1925700	DAYCON MECHANICAL SYSTEMS LTD.	1820 BAILEY AVENUE		THUNDER BAY	330269	5358915	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	OTHER FAB. STRUCTURES
ON1925700	DAYCON MECHANICAL SYSTEMS LTD.	1820 BAILEY AVENUE		THUNDER BAY	330269	5358915	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER FAB. STRUCTURES
ON1629800	DELMOR TRUCKING LTD	COPENHAGEN TRAILER COURT	SITE #8, COMPOUND 6	GORHAM TWP			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0046560	DEPT. OF NATIONAL DEFENCE	317 PARK AVENUE		THUNDER BAY	335325	5367148	L	IGNITABLE	LIGHT FUELS	DEFENCE SERVICES
ON0046560	DEPT. OF NATIONAL DEFENCE	317 PARK AVENUE		THUNDER BAY	335325	5367148	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	DEFENCE SERVICES
ON1258600	DINGWELL'S MACHINERY & SUPPLY LTD	963 ALLOY DRIVE		THUNDER BAY	333416	5364218	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	OTHER MACHINERY
ON1258600	DINGWELL'S MACHINERY & SUPPLY LTD	963 ALLOY DRIVE		THUNDER BAY	333416	5364218	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER MACHINERY
ON0471201	DOMINION MOTORS (THUNDER BAY 1984)12-558	882 COPPER CRESCENT		THUNDER BAY	332984	5364722	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	PAINT/BODY REPAIR
ON0986202	DOMINION SOIL INVESTIGATION INC. 12-600	605 HEWITSON STREET		THUNDER BAY	333441	5363821	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	ENGINEER OFFICES
ON0986202	DOMINION SOIL INVESTIGATION INC. 12-600	605 HEWITSON STREET		THUNDER BAY	333441	5362821	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ENGINEER OFFICES
ON0001418	DOMTAR FOREST PRODUCTS	GORGE CREEK RD./25 KM N OF NIPIGON ON	HWY 11 & THEN 30 KM E ON GORGE CREEK RD.	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	PULP INDUSTRY
ON0334200	DORION, CORPORATION OF THE TOWNSHIP OF	LOT 7, CONCESSION 4		DORION			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0009112	DOW CHEMICAL CANADA INC.	1950 NEEBING AVENUE		THUNDER BAY	329353	5358326	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	IND. INORGANIC CHEM.
ON2100600	DR. (OUT OF BUS)	911 EAST ARTHUR STREET		THUNDER BAY	333348	5361098	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	PLATEMAKING, ETC.
ON2100600	DR. (OUT OF BUS)	911 EAST ARTHUR STREET		THUNDER BAY	333348	5361098	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	PLATEMAKING, ETC.
ON2151300	DR. DONALD YOUNG	536 RIVER STREET		THUNDER BAY	335179	5368378	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CHIRO./OSTEOPATHS
ON2151300	DR. DONALD YOUNG	536 RIVER STREET		THUNDER BAY	335179	5368378	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	CHIRO./OSTEOPATHS
ON2100601	DR. PETER O. JACOBSON	400 BALMORAL STREET		THUNDER BAY	332868	5362115	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	PLATEMAKING, ETC.
ON2100601	DR. PETER O. JACOBSON	400 BALMORAL STREET		THUNDER BAY	332868	5362115	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	PLATEMAKING, ETC.
ON2130700	DR. W. MERCER ORTHODONTIST CLINIC	1318 VICTORIA STREET		THUNDER BAY	332936	5361422	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	DENTISTS, SPEC., OFF.
ON2130700	DR. W. MERCER ORTHODONTIST CLINIC	1318 VICTORIA STREET		THUNDER BAY	332936	5361422	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	DENTISTS, SPEC., OFF.
ON1957300	DRESSWELL	1101 SOUTH SYNDICATE AVENUE		THUNDER BAY	333006	5359782	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POWER LAUND./CLEANERS
ON0457300	DUKE'S CONSTRUCTION (LAKEHEAD) LTD13-089	LAKESHORE DRIVE	C/O RR #13, BOX 17	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	EXCAVAT. & GRADING
ON0464000	DUPORT LEASING LTD. 13-092	REAR OF 450 SIFTON AVENUE		THUNDER BAY	329029	5360434	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON0214905	E. S. FOX LIMITED	905 COMMERCE STREET		THUNDER BAY	329987	5360297	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	PLATE WORK INDUSTRY
ON0214905	E. S. FOX LIMITED	905 COMMERCE STREET		THUNDER BAY	329987	5360297	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	PLATE WORK INDUSTRY
ON0214905	E. S. FOX LIMITED	905 COMMERCE STREET		THUNDER BAY	329987	5360297	L	IGNITABLE	PETROLEUM DISTILLATES	PLATE WORK INDUSTRY

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GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0214905	E. S. FOX LIMITED	905 COMMERCE STREET		THUNDER BAY	329987	5360297	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	PLATE WORK INDUSTRY
ON0214905	E. S. FOX LIMITED	905 COMMERCE STREET		THUNDER BAY	329987	5360297	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PLATE WORK INDUSTRY
ON1484200	E.J. BILOSKI & CO. LTD. 14-957	737 MELBOURNE ROAD		THUNDER BAY	331760	5374328	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	SAND & GRAVEL PITS
ON1484200	E.J. BILOSKI & CO. LTD. 14-957	737 MELBOURNE ROAD		THUNDER BAY	331760	5374328	L	LIQUID INDUSTRIAL WASTE	PETROLEUM DISTILLATES	SAND & GRAVEL PITS
ON1484200	E.J. BILOSKI & CO. LTD. 14-957	737 MELBOURNE ROAD		THUNDER BAY	331760	5374328	L	IGNITABLE	PETROLEUM DISTILLATES	SAND & GRAVEL PITS
ON1484200	E.J. BILOSKI & CO. LTD. 14-957	737 MELBOURNE ROAD		THUNDER BAY	331760	5374328	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SAND & GRAVEL PITS
ON2294200	ENGINEERING NORTHWEST LTD.	200 SOUTH SYNDICATE AVENUE, SUITE 301		THUNDER BAY	333602	5361213	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ENGINEER OFFICES
ON0198111	ENVIRONMENT CANADA- AES INSPECTION	100 MAIN STREET		THUNDER BAY	335665	5364013	L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	ENVIRON. ADMIN.
ON0198111	ENVIRONMENT CANADA- AES INSPECTION	100 MAIN STREET		THUNDER BAY	335665	5364013	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ENVIRON. ADMIN.
ON2252300	ENVIROTEST LABS THUNDER BAY ANALYTICAL	1081 BARTON STREET		THUNDER BAY	332811	5363727	L	CORROSIVE	ACID WASTE - HEAVY METALS	OTHER SCI./TECH. OF.
ON0314801	ERB TRANSPORT LTD.	580 EIGHTH AVENUE		THUNDER BAY	333587	5364713	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GEN. FREIGHT TRUCK.
ON0314801	ERB TRANSPORT LTD.	580 EIGHTH AVENUE		THUNDER BAY	333587	5364713	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON1315771	ESSO PETROLEUM CANADA	645 MOUNTDALE AVENUE		THUNDER BAY	330005	5360679	S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	PETROLEUM PROD., WH.
ON1315771	ESSO PETROLEUM CANADA	645 MOUNTDALE AVENUE		THUNDER BAY	330005	5360679	L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON1315771	ESSO PETROLEUM CANADA	645 MOUNTDALE AVENUE		THUNDER BAY	330005	5360679	L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON1315771	ESSO PETROLEUM CANADA	645 MOUNTDALE AVENUE		THUNDER BAY	330005	5360679	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PETROLEUM PROD., WH.
ON1315783	ESSO PETROLEUM CANADA	HWY 11 & 17		THUNDER BAY			S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	PETROLEUM PROD., WH.
ON1315783	ESSO PETROLEUM CANADA	HWY 11 & 17		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON1315783	ESSO PETROLEUM CANADA	HWY 11 & 17		THUNDER BAY			L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON1315783	ESSO PETROLEUM CANADA	HWY 11 & 17		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PETROLEUM PROD., WH.
ON1315749	ESSO PETROLEUM CANADA	MCKELLAR ISLAND		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON1315749	ESSO PETROLEUM CANADA	MCKELLAR ISLAND		THUNDER BAY			L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON1315773	ESSO PETROLEUM CANADA	RR #2 HWY 17 & 130		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON1315773	ESSO PETROLEUM CANADA	RR #2 HWY 17 & 130		THUNDER BAY			S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	PETROLEUM PROD., WH.
ON1315773	ESSO PETROLEUM CANADA	RR #2 HWY 17 & 130		THUNDER BAY			L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON1315773	ESSO PETROLEUM CANADA	RR #2 HWY 17 & 130		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PETROLEUM PROD., WH.
ON1586201	ESSO PETROLEUM CANADA	SITE 11 CORNER OF MOUNT BALDY ROAD &	HWY #527 NORTH	THUNDERBAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PETROLEUM PROD., WH.
ON1586201	ESSO PETROLEUM CANADA	SITE 11 CORNER OF MOUNT BALDY ROAD &	HWY #527 NORTH	THUNDERBAY			L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON1586201	ESSO PETROLEUM CANADA	SITE 11 CORNER OF MOUNT BALDY ROAD &	HWY #527 NORTH	THUNDERBAY			L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON1586201	ESSO PETROLEUM CANADA	SITE 11 CORNER OF MOUNT BALDY ROAD &	HWY #527 NORTH	THUNDERBAY			S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	PETROLEUM PROD., WH.
ON0000712	ESSO PETROLEUM CANADA	THUNDER BAY AIRPORT	308 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	S	IGNITABLE	LIGHT FUELS	AIRCRAFT SEVICING
ON0000712	ESSO PETROLEUM CANADA	THUNDER BAY AIRPORT	308 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	IGNITABLE	OIL SKIMMINGS & SLUDGES	AIRCRAFT SEVICING
ON0000712	ESSO PETROLEUM CANADA	THUNDER BAY AIRPORT	308 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	AIRCRAFT SEVICING
ON0552338	ESSO PETROLEUM CANADA 14-169	P. SIPLEY	P.O. BOX 632, PACIFIC & 110TH STREETS	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0552338	ESSO PETROLEUM CANADA 14-169	P. SIPLEY	P.O. BOX 632, PACIFIC & 110TH STREETS	THUNDER BAY			L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON1315772	ESSO PETROLEUM CANADA 49-043	1849 DAWSON ROAD, THUNDER BAY	C/O 363 FALCONBRIDGE ROAD	SUDBURY			L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON1315772	ESSO PETROLEUM CANADA 49-043	1849 DAWSON ROAD, THUNDER BAY	C/O 363 FALCONBRIDGE ROAD	SUDBURY			L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON1315772	ESSO PETROLEUM CANADA 49-043	1849 DAWSON ROAD, THUNDER BAY	C/O 363 FALCONBRIDGE ROAD	SUDBURY			S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	PETROLEUM PROD., WH.
ON1315772	ESSO PETROLEUM CANADA 49-043	1849 DAWSON ROAD, THUNDER BAY	C/O 363 FALCONBRIDGE ROAD	SUDBURY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PETROLEUM PROD., WH.
ONF034300	EVEREST FUNERAL CHAPEL LIMITED	299 WAVERLEY STREET		THUNDER BAY	335359	5367274	S	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES
ONF034300	EVEREST FUNERAL CHAPEL LIMITED	299 WAVERLEY STREET		THUNDER BAY	335359	5367274	L	FOR MANIFEST, SPECIFIC GRAVITY	PATHOLOGICAL WASTES	FUNERAL HOMES
ONF034300	EVEREST FUNERAL CHAPEL LIMITED	299 WAVERLEY STREET		THUNDER BAY	335359	5367274	L	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES
ONF034301	EVEREST FUNERAL CHAPEL LIMITED	420 WEST GORE STREET		THUNDER BAY	330508	5359252	L	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES
ON1895800	FABMAR METALS INC.	1019 PACIFIC AVENUE		THUNDER BAY	335236	5362601	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER METAL FAB. IND.
ON2203900	FAIRBARNS MACHINE SHOP (1983) LTD.	835 NORTH VICKERS STREET		THUNDER BAY	333340	5362981	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	MACHINE SHOP IND.
ON0733412	FEDERAL EXPRESS CANADA 15-517	THUNDER BAY STATION	905 TUNGSTEN STREET	THUNDER BAY	333240	5364682	L	IGNITABLE	LIGHT FUELS	OTHER TRUCK./TRANS.
ON0733412	FEDERAL EXPRESS CANADA 15-517	THUNDER BAY STATION	905 TUNGSTEN STREET	THUNDER BAY	333240	5364682	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	OTHER TRUCK./TRANS.
ON0733412	FEDERAL EXPRESS CANADA 15-517	THUNDER BAY STATION	905 TUNGSTEN STREET	THUNDER BAY	333240	5364682	S	PATHOLOGICAL	PATHOLOGICAL WASTES	OTHER TRUCK./TRANS.
ON0733412	FEDERAL EXPRESS CANADA 15-517	THUNDER BAY STATION	905 TUNGSTEN STREET	THUNDER BAY	333240	5364682	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	OTHER TRUCK./TRANS.
ON0733412	FEDERAL EXPRESS CANADA 15-517	THUNDER BAY STATION	905 TUNGSTEN STREET	THUNDER BAY	333240	5364682	L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	OTHER TRUCK./TRANS.
ON0733412	FEDERAL EXPRESS CANADA 15-517	THUNDER BAY STATION	905 TUNGSTEN STREET	THUNDER BAY	333240	5364682	L	HAZARDOUS WASTE CHEMICAL	AROMATIC SOLVENTS	OTHER TRUCK./TRANS.
ON0733412	FEDERAL EXPRESS CANADA 15-517	THUNDER BAY STATION	905 TUNGSTEN STREET	THUNDER BAY	333240	5364682	L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	OTHER TRUCK./TRANS.
ON0204904	FISHER CONTROLS INC.	1165 RUSSELL STREET		THUNDER BAY	333223	5363416	S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	INDICAT., ETC. INST.
ON0204904	FISHER CONTROLS INC.	1165 RUSSELL STREET		THUNDER BAY	333223	5363416	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	INDICAT., ETC. INST.
ON0204904	FISHER CONTROLS INC.	1165 RUSSELL STREET		THUNDER BAY	333223	5363416	L	IGNITABLE	PETROLEUM DISTILLATES	INDICAT., ETC. INST.
ON0172103	FMG TIMBERJACK INC.	675 BEAVERHALL PLACE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	FOREST SERVICES
ON0172103	FMG TIMBERJACK INC.	675 BEAVERHALL PLACE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST SERVICES
ON1550800	FMG TIMBERJACK INC. 15-647	675 BEAVERHALL PLACE	C/O BOX 1060	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST SERVICES
ON1550800	FMG TIMBERJACK INC. 15-647	675 BEAVERHALL PLACE	C/O BOX 1060	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	FOREST SERVICES
ON0353100	FORT WILLIAM ANIMAL CLINIC	409 SOUTH SYNDICATE AVENUE		THUNDER BAY	333538	5360846	S	PATHOLOGICAL	PATHOLOGICAL WASTES	VETERINARY SERVICE
ON1920400	FORT WILLIAM CLINIC	117 S. MCKELLAR STREET		THUNDER BAY	333390	5361376	S	PATHOLOGICAL	PATHOLOGICAL WASTES	PUB. HEALTH CLINICS
ON1205100	FRANK'S LAUNDROMAT 15-472	227 ALGOMA ST. SOUTH		THUNDER BAY	334947	5366451	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POWER LAUND./CLEANERS
ONC000529	FRONTIER DIV. WESTBURNE IND. ENT. LTD.	315 SIMPSON STREET		THUNDER BAY	334149	5361831	G	HAZARDOUS INDUSTRIAL WASTE	WASTE COMPRESSED GASES	PLUMBING, ETC., WH.
ONC000529	FRONTIER DIV. WESTBURNE IND. ENT. LTD.	315 SIMPSON STREET		THUNDER BAY	334149	5361831	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	PLUMBING, ETC., WH.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ONC000529	FRONTIER DIV. WESTBURNE IND. ENT. LTD.	315 SIMPSON STREET		THUNDER BAY	334149	5361831	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PLUMBING, ETC., WH.
ON1334700	G C RENTALS & ENTERPR (OUT OF BUSINESS)	596 TENTH AVE.	PO BOX 157	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	EQUIP. RENTAL W. OP.
ON1334701	G C RENTALS & ENTERPRISES LTD	1960 MOUNTDALE AVENUE		THUNDER BAY	330084	5358753	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	EQUIP. RENTAL W. OP.
ON0084103	G.M. GEST INC. (OUT OF BUSINESS)	DAWSON ROAD ESSO TRUCK STOP	AT DAWSON ROAD & HUNTER ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER SITE WORK
ON2260200	GAETAN TREMBLAY	7035 DAWSON ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER SERVICES
ON2010500	GARRY T. RAINE TRUCKING LIMITED	2515 VERADALE STREET		THUNDER BAY	323457	5360633	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0000102	GENERAL CHEMICAL CANADA LIMITED	145 MACDOUGALL STREET		THUNDER BAY	337744	5368405	L	IGNITABLE	LIGHT FUELS	IND. INORGANIC CHEM.
ON0000102	GENERAL CHEMICAL CANADA LIMITED	145 MACDOUGALL STREET		THUNDER BAY	337744	5368405	L	LIQUID INDUSTRIAL WASTE	OTHER SPECIFIED INORGANICS	IND. INORGANIC CHEM.
ON0925400	GENERAL SCRAP PARTNERSHIP	305-104TH STREET		THUNDER BAY	333947	5360390	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	AUTOMOBILE WREAKING
ON0925400	GENERAL SCRAP PARTNERSHIP	305-104TH STREET		THUNDER BAY	333947	5360390	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AUTOMOBILE WREAKING
ON0925400	GENERAL SCRAP PARTNERSHIP	305-104TH STREET		THUNDER BAY	333947	5360390	L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	AUTOMOBILE WREAKING
ON2100000	GEORGE E. LISTER	66 CARRIE STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	OTHER COMM. PRINTING
ON2100000	GEORGE E. LISTER	66 CARRIE STREET		THUNDER BAY			L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	OTHER COMM. PRINTING
ON0905600	GEORGE O. HILL SUPPLY LIMITED 16-191	706 BALMORAL STREET		THUNDER BAY	332890	5362711	L	IGNITABLE	PETROLEUM DISTILLATES	IND. MACH. RENTAL
ON0905600	GEORGE O. HILL SUPPLY LIMITED 16-191	706 BALMORAL STREET		THUNDER BAY	332890	5362711	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ON0003951	GLIDDEN (OUT OF BUS)	ICI PAINTS (CANADA) INC.	400 MEMORIAL AVENUE	THUNDER BAY	334559	5365918	L	FOR MANIFEST, SPECIFIC GRAVITY	PAINT/PIGMENT/COATING RESIDUES	PAINT & VARNISH IND.
ON0003951	GLIDDEN (OUT OF BUS)	ICI PAINTS (CANADA) INC.	400 MEMORIAL AVENUE	THUNDER BAY	334559	5365918	L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	PAINT & VARNISH IND.
ON0003951	GLIDDEN (OUT OF BUS)	ICI PAINTS (CANADA) INC.	400 MEMORIAL AVENUE	THUNDER BAY	334559	5365918	L	LIQUID INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	PAINT & VARNISH IND.
ON0003951	GLIDDEN (OUT OF BUS)	ICI PAINTS (CANADA) INC.	400 MEMORIAL AVENUE	THUNDER BAY	334559	5365918	L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	PAINT & VARNISH IND.
ON0003951	GLIDDEN (OUT OF BUS)	ICI PAINTS (CANADA) INC.	400 MEMORIAL AVENUE	THUNDER BAY	334559	5365918	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	PAINT & VARNISH IND.
ON0003954	GLIDDEN PAINTS	ICI PAINTS (CANADA) INC.	609 WEST ARTHUR STREET	THUNDER BAY	330030	5361220	L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	PAINT & VARNISH IND.
ON0003954	GLIDDEN PAINTS	ICI PAINTS (CANADA) INC.	609 WEST ARTHUR STREET	THUNDER BAY	330030	5361220	L	FOR MANIFEST, SPECIFIC GRAVITY	PAINT/PIGMENT/COATING RESIDUES	PAINT & VARNISH IND.
ON0003954	GLIDDEN PAINTS	ICI PAINTS (CANADA) INC.	609 WEST ARTHUR STREET	THUNDER BAY	330030	5361220	L	LIQUID INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	PAINT & VARNISH IND.
ON0003954	GLIDDEN PAINTS	ICI PAINTS (CANADA) INC.	609 WEST ARTHUR STREET	THUNDER BAY	330030	5361220	L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	PAINT & VARNISH IND.
ON0003954	GLIDDEN PAINTS	ICI PAINTS (CANADA) INC.	609 WEST ARTHUR STREET	THUNDER BAY	330030	5361220	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	PAINT & VARNISH IND.
ON1133001	GORDON TRAILER SALES	1/4 MILE NORTH OF HWY. 17 ON	TWIN CITY CROSSROAD	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	COMMERICAL TRAILER
ON1133000	GORDON TRAILER(OUT OF BUSINESS)'8917-233	605 HEWITSON ST. BOX 1232		THUNDER BAY	333441	5363821	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	COMMERICAL TRAILER
ON0928788	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #421	640 RIVER STREET	THUNDER BAY	334837	5368578	L	CORROSIVE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0928788	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #421	640 RIVER STREET	THUNDER BAY	334837	5368578	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0928788	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #421	640 RIVER STREET	THUNDER BAY	334837	5368578	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON2392119	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #422	505 ARTHUR STREET WEST	THUNDER BAY	330414	5361244	L	CORROSIVE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON2392119	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #422	505 ARTHUR STREET WEST	THUNDER BAY	330414	5361244	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON2392119	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #422	505 ARTHUR STREET WEST	THUNDER BAY	330414	5361244	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON2392120	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #424	1101 ARTHUR STREET WEST	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON2392120	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #424	1101 ARTHUR STREET WEST	THUNDER BAY			L	CORROSIVE	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON2392120	GREAT ATLANTIC & PACIFIC CO. OF CDA.LTD.	A & P #424	1101 ARTHUR STREET WEST	THUNDER BAY			L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0342600	GREAT WEST TIMBER LIMITED	LAKESHORE DRIVE AT CLAVET STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	WOOD PRESERVATION
ON0342600	GREAT WEST TIMBER LIMITED	LAKESHORE DRIVE AT CLAVET STREET		THUNDER BAY			S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	WOOD PRESERVATION
ON0342600	GREAT WEST TIMBER LIMITED	LAKESHORE DRIVE AT CLAVET STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	WOOD PRESERVATION
ON0342600	GREAT WEST TIMBER LIMITED	LAKESHORE DRIVE AT CLAVET STREET		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	WOOD PRESERVATION
ON0283134	GVT. OF CAN. - R.C.M.P.	THUNDER BAY DETACHMENT	430 SOUTH WATERLOO STREET	THUNDER BAY	332093	5360821	S	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	POLICE SERVICES
ON0283134	GVT. OF CAN. - R.C.M.P.	THUNDER BAY DETACHMENT	430 SOUTH WATERLOO STREET	THUNDER BAY	332093	5360821	S	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	POLICE SERVICES
ON0958802	H.T. LEASING (THUNDER BAY) LTD.	1475 WEST WALSH STREET		THUNDER BAY	329415	5360287	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	CHART./SIGHTSEEING
ON0958802	H.T. LEASING (THUNDER BAY) LTD.	1475 WEST WALSH STREET		THUNDER BAY	329415	5360287	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CHART./SIGHTSEEING
ON0958801	H.T. LEASING THUNDER(OUT OF BUSINESS)285		395 FORT WILLIAM RD.	THUNDER BAY	334823	5365777	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	CHART./SIGHTSEEING
ON0958801	H.T. LEASING THUNDER(OUT OF BUSINESS)285		395 FORT WILLIAM RD.	THUNDER BAY	334823	5365777	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CHART./SIGHTSEEING
ON0837200	HACQUOIL CONSTRUCTION CO LTD	LOT 34, CONC A		PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	HIGHWAYS, STR., ETC.
ON2127500	HALF-WAY MOTORS LTD. (1989)	940 MEMORIAL AVENUE		THUNDER BAY	333784	5364282	L	IGNITABLE	PETROLEUM DISTILLATES	NEW AUTO DEALERS
ON2127500	HALF-WAY MOTORS LTD. (1989)	940 MEMORIAL AVENUE		THUNDER BAY	333784	5364282	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	NEW AUTO DEALERS
ON2127500	HALF-WAY MOTORS LTD. (1989)	940 MEMORIAL AVENUE		THUNDER BAY	333784	5364282	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	NEW AUTO DEALERS
ONF059300	HARBOURVIEW FUNERAL CENTRE INC.	499 CUMBERLAND STREET NORTH		THUNDER BAY	337597	5368563	S	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES
ON0321801	HIGHVIEW ANIMAL CLINIC	(MEADOWS ANIMAL CLINIC)	644 ARTHUR STREET WEST	THUNDER BAY	329897	5361138	S	PATHOLOGICAL	PATHOLOGICAL WASTES	VETERINARY SERVICE
ON0321800	HIGHVIEW ANIMAL CLINIC	806 RED RIVER ROAD		THUNDER BAY	333828	5368163	S	PATHOLOGICAL	PATHOLOGICAL WASTES	VETERINARY SERVICE
ON0415000	HILL PROFESSIONAL PHOTOGRAPHY	9 SOUTH CUMBERLAND STREET		THUNDER BAY	335831	5366949	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0345400	HOGAN'S CARTAGE	124 NORTH HAROLD STREET		THUNDER BAY	333257	5361544	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0464300	HOGARTH-WESTMOUNT HOSPITAL 20-091	300 LILLIE STREET NORTH		THUNDER BAY	331818	5361831	S	PATHOLOGICAL	PATHOLOGICAL WASTES	GENERAL HOSPITALS
ON0464300	HOGARTH-WESTMOUNT HOSPITAL 20-091	300 LILLIE STREET NORTH		THUNDER BAY	331818	5361831	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GENERAL HOSPITALS
ON2009200	HOLLAND TRUCKING	LOT 43, CONCESSION B		DAWSON ROAD LOTS TWP.			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON2009200	HOLLAND TRUCKING	LOT 43, CONCESSION B		DAWSON ROAD LOTS TWP.			L	IGNITABLE	PETROLEUM DISTILLATES	LOGGING INDUSTRY
ON1224400	HOOD LOGGING EQUIP CAN. INC. 19-408	R.R. #2, LOT 3, CONC. 2, ARTHUR ST. W.		PAIPOONGE TOWNSHIP			L	IGNITABLE	WASTE OILS & LUBRICANTS	CONSTR./FOREST. MACH.
ON1224400	HOOD LOGGING EQUIP CAN. INC. 19-408	R.R. #2, LOT 3, CONC. 2, ARTHUR ST. W.		PAIPOONGE TOWNSHIP			L	IGNITABLE	LIGHT FUELS	CONSTR./FOREST. MACH.
ON1120300	HUSKY OIL MARKETING COMPANY 20-302	MCKELLAR ISLAND, HUSKEY BULK TERMINAL	235 PHILLIPS STREET	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	REFINED PETRO. PROD.
ON1120300	HUSKY OIL MARKETING COMPANY 20-302	MCKELLAR ISLAND, HUSKEY BULK TERMINAL	235 PHILLIPS STREET	THUNDER BAY			L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	REFINED PETRO. PROD.
ON1997200	HYPOWER SYSTEMS INC.	890 ALLOY PLACE		THUNDER BAY	333350	5364640	L	IGNITABLE	PETROLEUM DISTILLATES	OTHER REPAIR SERV.
ON0003978	ICI PAINTS (CANADA) INC	676 MEMORIAL AVENUE		THUNDER BAY	334041	5364955	L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	PAINT & VARNISH IND.
ON0003978	ICI PAINTS (CANADA) INC	676 MEMORIAL AVENUE		THUNDER BAY	334041	5364955	L	LIQUID INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	PAINT & VARNISH IND.
ON0003978	ICI PAINTS (CANADA) INC	676 MEMORIAL AVENUE		THUNDER BAY	334041	5364955	L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	PAINT & VARNISH IND.
ON0003978	ICI PAINTS (CANADA) INC	676 MEMORIAL AVENUE		THUNDER BAY	334041	5364955	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	PAINT & VARNISH IND.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	HAZARDOUS WASTE CHEMICAL	HALOGENATED PESTICIDES	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	HAZARDOUS WASTE CHEMICAL	AROMATIC SOLVENTS	PETROLEUM PROD., WH.

Table H-6
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GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	S	FOR MANIFEST, SPECIFIC GRAVITY	LIGHT FUELS	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	LIQUID INDUSTRIAL WASTE	HEAVY FUELS	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	CORROSIVE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PETROLEUM PROD., WH.
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		THUNDER BAY	335374	5362603	S	REGISTERABLE SOLID WASTE	LIGHT FUELS	PETROLEUM PROD., WH.
ON0000757	IMPERIAL OIL LIMITED	1020 PACIFIC AVENUE		THUNDER BAY	335683	5362706	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PETROLEUM PROD., WH.
ON0000757	IMPERIAL OIL LIMITED	1020 PACIFIC AVENUE		THUNDER BAY	335683	5362706	S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	PETROLEUM PROD., WH.
ON0000757	IMPERIAL OIL LIMITED	1020 PACIFIC AVENUE		THUNDER BAY	335683	5362706	L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON0000757	IMPERIAL OIL LIMITED	1020 PACIFIC AVENUE		THUNDER BAY	335683	5362706	L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON1468000	IMPORT MOTORS 21-521	835 N VICKERS ST.		THUNDER BAY	333340	5362981	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	GARAGES(GEN. REPAIR)
ON1468000	IMPORT MOTORS 21-521	835 N VICKERS ST.		THUNDER BAY	333340	5362981	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GARAGES(GEN. REPAIR)
ON1580600	INDUSTRIAL CHROME & MACHINE LTD. 21-565	1045 GORHAM STREET		THUNDERBAY	333724	5363833	L	HAZARDOUS INDUSTRIAL WASTE	ALKALINE WASTES - HEAVY METALS	COATING OF METAL PR.
ON1580600	INDUSTRIAL CHROME & MACHINE LTD. 21-565	1045 GORHAM STREET		THUNDERBAY	333724	5363833	L	CORROSIVE	ACID WASTE - HEAVY METALS	COATING OF METAL PR.
ON1928102	INLAND TECHNOLOGIES INC.	100 PRINCESS STREET	THUNDER BAY INTERNATIONAL AIRPORT	THUNDER BAY	328856	5360297	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	REFINED PETRO. PROD.
ON1185300	INTERCITY INDUSTRIAL SUPPLY LTD. 21-411	669 SQUIER STREET		THUNDER BAY	333761	5364805	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	IND. MACHINERY, WH.
ON1185300	INTERCITY INDUSTRIAL SUPPLY LTD. 21-411	669 SQUIER STREET		THUNDER BAY	333761	5364805	L	IGNITABLE	LIGHT FUELS	IND. MACHINERY, WH.
ON1185300	INTERCITY INDUSTRIAL SUPPLY LTD. 21-411	669 SQUIER STREET		THUNDER BAY	333761	5364805	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. MACHINERY, WH.
ON1890812	INTERLINK FREIGHT SYSTEMS INC.	470 BALMORAL AVE.		THUNDER BAY	332877	5362316	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	GEN. FREIGHT TRUCK.
ON1890812	INTERLINK FREIGHT SYSTEMS INC.	470 BALMORAL AVE.		THUNDER BAY	332877	5362316	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	GEN. FREIGHT TRUCK.
ON0316400	IRON RANGE BUS LINES INC.	294 MEMORIAL AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SCHOOL BUS OPER.
ON0316400	IRON RANGE BUS LINES INC.	294 MEMORIAL AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	SCHOOL BUS OPER.
ON0316401	IRON RANGE BUS LINES INC.	OLIVER ROAD AND GOLFLINKS ROAD		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	SCHOOL BUS OPER.
ON0316401	IRON RANGE BUS LINES INC.	OLIVER ROAD AND GOLFLINKS ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	SCHOOL BUS OPER.
ON0316401	IRON RANGE BUS LINES INC.	OLIVER ROAD AND GOLFLINKS ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SCHOOL BUS OPER.
ON0561000	IRWIN (SEE & USE ON0430015) 21-174	771 FORT WILLIAM ROAD	P.O. BOX 426, STATION "F"	THUNDER BAY	334341	5364247	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	READY-MIX CONCRETE
ON2047501	J.A.P. EQUIPMENT LTD.	1540 ROSSLYN ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON2047500	J.A.P. EQUIPMENT LTD.(OUT OF BUSINESS)	1400 DAWSON ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON2042900	J.M. GAGNON TRUCKING INC.	COPENHAGEN ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LUB. OIL & GREASE
ON0899500	J.U. CALONEGO CONSTRUCTION LTD.	1250 ROSSLYN ROAD		THUNDER BAY	328554	5359073	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTRTUCTION EQUIP.
ON0889801	JAPAN (OUT OF BUS)		1101 WEST ARTHUR ST. THUNDER BAY MALL	THUNDER BAY			L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON0903200	JAPAN CAMERA CENTRE 22-241	502031 ONTARIO LTD.	1000 FORT WILLIAM RD/INTERCITY SHPG CT	THUNDER BAY	333925	5363558	S	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ONF008800	JENKENS FUNERAL HOME LTD.	226 SOUTH SYNDICATE AVENUE		THUNDER BAY	333600	5361155	L	FOR MANIFEST, SPECIFIC GRAVITY	PATHOLOGICAL WASTES	FUNERAL HOMES
ONF008800	JENKENS FUNERAL HOME LTD.	226 SOUTH SYNDICATE AVENUE		THUNDER BAY	333600	5361155	L	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ONF008800	JENKENS FUNERAL HOME LTD.	226 SOUTH SYNDICATE AVENUE		THUNDER BAY	333600	5361155	S	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES
ON2300700	JOHN BUCHANAN & SONS LTD	1550 DAWSON ROAD		THUNDER BAY	331260	5370464	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST PROD. TRUCK.
ON0827107	JOHN EMERY GEOTECHNICAL ENG. LTD.	1100 RUSSELL STREET		THUNDER BAY	333120	5363672	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	OTHER SCI./TECH. OF.
ON1271800	JOHN MERKLEY 22-404	2280 GOVERNMENT ROAD, RR 12		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON1327200	JOHN WYLLYCHUK	LOT 13, CONC. 2		PAIPOONGE			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	EXCAVAT. & GRADING
ON0554808	JOHNSON CONTROLS LTD.	883 TUNGSTEN STREET, UNIT #2		THUNDER BAY	333238	5364723	L	HAZARDOUS INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	WET HEAT. & AIR CON.
ON1375200	JOSEPH LUCHESKI CONSTRUCTING LTD.		LOT 22, CONC. 3	PAIPOONGE			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON2139300	KBM FORESTRY CONSULTANTS INC.	349 MOONEY AVE.		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON1102900	KELLERRI HOLDINGS LTD.	LOT 21, CONC. 3		PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON1926700	KEVIN HYATT TRUCKING	160 LAKESHORE DRIVE		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON2334800	KILBORN'S BACKHOE SERVICES	LOT 18, CONCESSION 6		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER CONST. SERVICES
ON0874900	KILRED WINDING INDUSTRIES LTD. 23-258	408 MAIN STREET		THUNDER BAY	334321	5363956	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECTRIC MOTOR REPAIR
ON0874900	KILRED WINDING INDUSTRIES LTD. 23-258	408 MAIN STREET		THUNDER BAY	334321	5363956	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELECTRIC MOTOR REPAIR
ON0914100	KOVAL (OUT OF BUS) 23-279		CONC. 4, PTLT 25, ARTHUR ST.	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0914102	KOVAL TRANSPORTS LTD.	712 NORTH VICKERS STREET		THUNDER BAY	333427	5362862	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON1167000	LAC DES ILES MINES LTD.	MINING LEASES CLAIM 251,252,253&254		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	NICKEL/COPPER MINE
ON1167000	LAC DES ILES MINES LTD.	MINING LEASES CLAIM 251,252,253&254		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	NICKEL/COPPER MINE
ON1167000	LAC DES ILES MINES LTD.	MINING LEASES CLAIM 251,252,253&254		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	NICKEL/COPPER MINE
ON1167000	LAC DES ILES MINES LTD.	MINING LEASES CLAIM 251,252,253&254		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	NICKEL/COPPER MINE
ON1167000	LAC DES ILES MINES LTD.	MINING LEASES CLAIM 251,252,253&254		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	NICKEL/COPPER MINE
ON0483100	LACEY'S TAXI LTD. 24-150		441 SOUTH SYNDICATE AVENUE	THUNDER BAY	333536	5360760	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	TAXICAB INDUSTRY
ON0213951	LAFARGE CANADA INC.	360 WILLIAM STREET EAST		THUNDER BAY	334389	5363162	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	CONCRETE PIPE IND.
ON0430015	LAFARGE CONSTRUCTION MATERIALS 21-174	771 FORT WILLIAM ROAD		THUNDER BAY	334341	5364247	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	READY-MIX CONCRETE
ON0053641	LAIDLAW TRANSIT LIMITED	2100 MOUNTDALE AVENUE		THUNDER BAY	330028	5358396	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	CHART./SIGHTSEEING
ON0053641	LAIDLAW TRANSIT LIMITED	2100 MOUNTDALE AVENUE		THUNDER BAY	330028	5358396	L	IGNITABLE	PETROLEUM DISTILLATES	CHART./SIGHTSEEING
ON0053641	LAIDLAW TRANSIT LIMITED	2100 MOUNTDALE AVENUE		THUNDER BAY	330028	5358396	L	LIQUID INDUSTRIAL WASTE	LIGHT FUELS	CHART./SIGHTSEEING
ON0053641	LAIDLAW TRANSIT LIMITED	2100 MOUNTDALE AVENUE		THUNDER BAY	330028	5358396	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	CHART./SIGHTSEEING
ON0053641	LAIDLAW TRANSIT LIMITED	2100 MOUNTDALE AVENUE		THUNDER BAY	330028	5358396	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CHART./SIGHTSEEING
ON0332000	LAINE & FAIRBAIRN	550 WINNIPEG AVENUE		THUNDER BAY	334164	5365212	L	LIQUID INDUSTRIAL WASTE	ALKALINE WASTES - OTHER METALS	OTHER VEHICLE ACCES.
ON0793316	LAKEHEAD (OUT OF BUS)	2135 SILLS STREET		THUNDER BAY	331964	5361254	L	PCB WASTE	PCB'S	ELEMT./SECON. EDUC.
ON0793308	LAKEHEAD BOARD OF EDUCATION	KINGSWAY PUBLIC SCHOOL	315 EMPIRE AVENUE	THUNDER BAY	332130	5360228	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793308	LAKEHEAD BOARD OF EDUCATION	KINGSWAY PUBLIC SCHOOL	315 EMPIRE AVENUE	THUNDER BAY	332130	5360228	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON1221800	LAKEHEAD DIST. CATHOLIC SCHOOL BOARD	ST. PATRICK HIGH SCHOOL	621 SELKIRK AVENUE	THUNDER BAY	332582	5360460	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.
ON1221800	LAKEHEAD DIST. CATHOLIC SCHOOL BOARD	ST. PATRICK HIGH SCHOOL	621 SELKIRK AVENUE	THUNDER BAY	332582	5360460	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON1221800	LAKEHEAD DIST. CATHOLIC SCHOOL BOARD	ST. PATRICK HIGH SCHOOL	621 SELKIRK AVENUE	THUNDER BAY	332582	5360460	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1221800	LAKEHEAD DIST. CATHOLIC SCHOOL BOARD	ST. PATRICK HIGH SCHOOL	621 SELKIRK AVENUE	THUNDER BAY	332582	5360460	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON1221806	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	539 GRENVILLE AVENUE	ST. PAUL SCHOOL	THUNDER BAY	338224	5370928	S	PATHOLOGICAL	PATHOLOGICAL WASTES	ELEMT./SECON. EDUC.
ON1221805	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	735 SOUTH SELKIRK STREET	ST. ELIZABETH SCHOOL	THUNDER BAY	332634	5360222	S	PATHOLOGICAL	PATHOLOGICAL WASTES	ELEMT./SECON. EDUC.
ON1221802	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	HOLY FAMILY SCHOOL	RR 1, ROSSLYN ROAD	THUNDER BAY			L	PATHOLOGICAL	PATHOLOGICAL WASTES	ELEMT./SECON. EDUC.
ON1221803	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	ST. BERNARD SCHOOL	655 RIVER STREET	THUNDER BAY	334655	5368515	L	PATHOLOGICAL	PATHOLOGICAL WASTES	ELEMT./SECON. EDUC.
ON1221801	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	ST. IGNATIUS HIGH SCHOOL	285 GIBSON AVE.	THUNDER BAY	337515	5368957	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON1221801	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	ST. IGNATIUS HIGH SCHOOL	285 GIBSON AVE.	THUNDER BAY	337515	5368957	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.
ON1221801	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	ST. IGNATIUS HIGH SCHOOL	285 GIBSON AVE.	THUNDER BAY	337515	5368957	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON1221801	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	ST. IGNATIUS HIGH SCHOOL	285 GIBSON AVE.	THUNDER BAY	337515	5368957	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON1221801	LAKEHEAD DISTRICT CATHOLIC SCHOOL BOARD	ST. IGNATIUS HIGH SCHOOL	285 GIBSON AVE.	THUNDER BAY	337515	5368957	L	PATHOLOGICAL	PATHOLOGICAL WASTES	ELEMT./SECON. EDUC.
ON0793313	LAKEHEAD DISTRICT SCHOOL BOARD	525 HARTLAND STREET	HARTLAND SHOP	THUNDER BAY	333827	5366436	L	IGNITABLE	PAINT/PIGMENT/COATING RESIDUES	ELEMT./SECON. EDUC.
ON0793313	LAKEHEAD DISTRICT SCHOOL BOARD	525 HARTLAND STREET	HARTLAND SHOP	THUNDER BAY	333827	5366436	L	PCB WASTE	PCB'S	ELEMT./SECON. EDUC.
ON0793313	LAKEHEAD DISTRICT SCHOOL BOARD	525 HARTLAND STREET	HARTLAND SHOP	THUNDER BAY	333827	5366436	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.
ON0793313	LAKEHEAD DISTRICT SCHOOL BOARD	525 HARTLAND STREET	HARTLAND SHOP	THUNDER BAY	333827	5366436	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON0793313	LAKEHEAD DISTRICT SCHOOL BOARD	525 HARTLAND STREET	HARTLAND SHOP	THUNDER BAY	333827	5366436	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON0793319	LAKEHEAD DISTRICT SCHOOL BOARD	BLACK BAY ROAD PUBLIC SCHOOL	360 BLACK BAY ROAD	THUNDER BAY	338396	5371275	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793319	LAKEHEAD DISTRICT SCHOOL BOARD	BLACK BAY ROAD PUBLIC SCHOOL	360 BLACK BAY ROAD	THUNDER BAY	338396	5371275	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793318	LAKEHEAD DISTRICT SCHOOL BOARD	C.D. HOWE PUBLIC SCHOOL	30 WISHART CRESCENT	THUNDER BAY	334176	5368570	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793318	LAKEHEAD DISTRICT SCHOOL BOARD	C.D. HOWE PUBLIC SCHOOL	30 WISHART CRESCENT	THUNDER BAY	334176	5368570	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793312	LAKEHEAD DISTRICT SCHOOL BOARD	FORT WILLIAM COLLEGIATE INSTITUTE	512 SOUTH MARKS STREET	THUNDER BAY	333133	5360636	L	PCB WASTE	PCB'S	ELEMT./SECON. EDUC.
ON0793312	LAKEHEAD DISTRICT SCHOOL BOARD	FORT WILLIAM COLLEGIATE INSTITUTE	512 SOUTH MARKS STREET	THUNDER BAY	333133	5360636	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793312	LAKEHEAD DISTRICT SCHOOL BOARD	FORT WILLIAM COLLEGIATE INSTITUTE	512 SOUTH MARKS STREET	THUNDER BAY	333133	5360636	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793312	LAKEHEAD DISTRICT SCHOOL BOARD	FORT WILLIAM COLLEGIATE INSTITUTE	512 SOUTH MARKS STREET	THUNDER BAY	333133	5360636	S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	ELEMT./SECON. EDUC.
ON0793314	LAKEHEAD DISTRICT SCHOOL BOARD	GRON MORGAN HIGH SCHOOL	174 MARLBOROUGH ROAD	THUNDER BAY	333889	5366996	L	IGNITABLE	PAINT/PIGMENT/COATING RESIDUES	ELEMT./SECON. EDUC.
ON0793314	LAKEHEAD DISTRICT SCHOOL BOARD	GRON MORGAN HIGH SCHOOL	174 MARLBOROUGH ROAD	THUNDER BAY	333889	5366996	S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	ELEMT./SECON. EDUC.
ON0793314	LAKEHEAD DISTRICT SCHOOL BOARD	GRON MORGAN HIGH SCHOOL	174 MARLBOROUGH ROAD	THUNDER BAY	333889	5366996	L	IGNITABLE	PETROLEUM DISTILLATES	ELEMT./SECON. EDUC.
ON0793314	LAKEHEAD DISTRICT SCHOOL BOARD	GRON MORGAN HIGH SCHOOL	174 MARLBOROUGH ROAD	THUNDER BAY	333889	5366996	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON0793314	LAKEHEAD DISTRICT SCHOOL BOARD	GRON MORGAN HIGH SCHOOL	174 MARLBOROUGH ROAD	THUNDER BAY	333889	5366996	L	PCB WASTE	PCB'S	ELEMT./SECON. EDUC.
ON0793314	LAKEHEAD DISTRICT SCHOOL BOARD	GRON MORGAN HIGH SCHOOL	174 MARLBOROUGH ROAD	THUNDER BAY	333889	5366996	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.
ON0793310	LAKEHEAD DISTRICT SCHOOL BOARD	HAMMARSKJOLD HIGH SCHOOL	80 CLARKSON AVENUE SOUTH	THUNDER BAY	333457	5368068	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793310	LAKEHEAD DISTRICT SCHOOL BOARD	HAMMARSKJOLD HIGH SCHOOL	80 CLARKSON AVENUE SOUTH	THUNDER BAY	333457	5368068	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0793310	LAKEHEAD DISTRICT SCHOOL BOARD	HAMMARSKJOLD HIGH SCHOOL	80 CLARKSON AVENUE SOUTH	THUNDER BAY	333457	5368068	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON0793310	LAKEHEAD DISTRICT SCHOOL BOARD	HAMMARSKJOLD HIGH SCHOOL	80 CLARKSON AVENUE SOUTH	THUNDER BAY	333457	5368068	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793310	LAKEHEAD DISTRICT SCHOOL BOARD	HAMMARSKJOLD HIGH SCHOOL	80 CLARKSON AVENUE SOUTH	THUNDER BAY	333457	5368068	G	IGNITABLE	WASTE COMPRESSED GASES	ELEMT./SECON. EDUC.
ON0793309	LAKEHEAD DISTRICT SCHOOL BOARD	HILLCREST HIGH SCHOOL	96 NORTH HIGH STREET	THUNDER BAY	334916	5367756	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON0793309	LAKEHEAD DISTRICT SCHOOL BOARD	HILLCREST HIGH SCHOOL	96 NORTH HIGH STREET	THUNDER BAY	334916	5367756	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793309	LAKEHEAD DISTRICT SCHOOL BOARD	HILLCREST HIGH SCHOOL	96 NORTH HIGH STREET	THUNDER BAY	334916	5367756	G	IGNITABLE	WASTE COMPRESSED GASES	ELEMT./SECON. EDUC.
ON0793309	LAKEHEAD DISTRICT SCHOOL BOARD	HILLCREST HIGH SCHOOL	96 NORTH HIGH STREET	THUNDER BAY	334916	5367756	L	PCB WASTE	PCB'S	ELEMT./SECON. EDUC.
ON0793309	LAKEHEAD DISTRICT SCHOOL BOARD	HILLCREST HIGH SCHOOL	96 NORTH HIGH STREET	THUNDER BAY	334916	5367756	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793309	LAKEHEAD DISTRICT SCHOOL BOARD	HILLCREST HIGH SCHOOL	96 NORTH HIGH STREET	THUNDER BAY	334916	5367756	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.
ON0793309	LAKEHEAD DISTRICT SCHOOL BOARD	HILLCREST HIGH SCHOOL	96 NORTH HIGH STREET	THUNDER BAY	334916	5367756	S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	ELEMT./SECON. EDUC.
ON0793302	LAKEHEAD DISTRICT SCHOOL BOARD	KAKABEKA FALLS DISTRICT PUBLIC SCHOOL	3796 HIGHWAY 17	CONMEE TWP.			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793302	LAKEHEAD DISTRICT SCHOOL BOARD	KAKABEKA FALLS DISTRICT PUBLIC SCHOOL	3796 HIGHWAY 17	CONMEE TWP.			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793315	LAKEHEAD DISTRICT SCHOOL BOARD	NORTHWOOD HIGH SCHOOLN	315 EDWARD STREET NORTH	THUNDER BAY	331238	5362066	L	CORROSIVE	OTHER INORGANIC ACID WASTES	ELEMT./SECON. EDUC.
ON0793315	LAKEHEAD DISTRICT SCHOOL BOARD	NORTHWOOD HIGH SCHOOLN	315 EDWARD STREET NORTH	THUNDER BAY	331238	5362066	L	IGNITABLE	PETROLEUM DISTILLATES	ELEMT./SECON. EDUC.
ON0793315	LAKEHEAD DISTRICT SCHOOL BOARD	NORTHWOOD HIGH SCHOOLN	315 EDWARD STREET NORTH	THUNDER BAY	331238	5362066	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.
ON0793315	LAKEHEAD DISTRICT SCHOOL BOARD	NORTHWOOD HIGH SCHOOLN	315 EDWARD STREET NORTH	THUNDER BAY	331238	5362066	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON0793307	LAKEHEAD DISTRICT SCHOOL BOARD	OLIVER ROAD PUBLIC SCHOOL	500 OLIVER ROAD	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793307	LAKEHEAD DISTRICT SCHOOL BOARD	OLIVER ROAD PUBLIC SCHOOL	500 OLIVER ROAD	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793303	LAKEHEAD DISTRICT SCHOOL BOARD	PINE STREET PUBLIC SCHOOL	20 PINE STREET	THUNDER BAY	334473	5367671	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793303	LAKEHEAD DISTRICT SCHOOL BOARD	PINE STREET PUBLIC SCHOOL	20 PINE STREET	THUNDER BAY	334473	5367671	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793305	LAKEHEAD DISTRICT SCHOOL BOARD	PORT ARTHUR COLLEGIATE INSTITUTE	401 RED RIVER ROAD	THUNDER BAY	335223	5367347	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793305	LAKEHEAD DISTRICT SCHOOL BOARD	PORT ARTHUR COLLEGIATE INSTITUTE	401 RED RIVER ROAD	THUNDER BAY	335223	5367347	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793304	LAKEHEAD DISTRICT SCHOOL BOARD	SIR WINSTON CHURCHILL COL.& VOC. INST.	130 W. CHURCHILL DRIVE	THUNDER BAY	331021	5362051	G	REACTIVE	WASTE COMPRESSED GASES	ELEMT./SECON. EDUC.
ON0793304	LAKEHEAD DISTRICT SCHOOL BOARD	SIR WINSTON CHURCHILL COL.& VOC. INST.	130 W. CHURCHILL DRIVE	THUNDER BAY	331021	5362051	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793304	LAKEHEAD DISTRICT SCHOOL BOARD	SIR WINSTON CHURCHILL COL.& VOC. INST.	130 W. CHURCHILL DRIVE	THUNDER BAY	331021	5362051	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.
ON0793304	LAKEHEAD DISTRICT SCHOOL BOARD	SIR WINSTON CHURCHILL COL.& VOC. INST.	130 W. CHURCHILL DRIVE	THUNDER BAY	331021	5362051	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793304	LAKEHEAD DISTRICT SCHOOL BOARD	SIR WINSTON CHURCHILL COL.& VOC. INST.	130 W. CHURCHILL DRIVE	THUNDER BAY	331021	5362051	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON0793306	LAKEHEAD DISTRICT SCHOOL BOARD	ST. JAMES PUBLIC SCHOOL	243 ST. JAMES STREET	THUNDER BAY	336229	5367789	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793306	LAKEHEAD DISTRICT SCHOOL BOARD	ST. JAMES PUBLIC SCHOOL	243 ST. JAMES STREET	THUNDER BAY	336229	5367789	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793320	LAKEHEAD DISTRICT SCHOOL BOARD	VANCE CHAPMAN PUBLIC SCHOOL	1000 HURON AVENUE	THUNDER BAY	335795	5369941	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793320	LAKEHEAD DISTRICT SCHOOL BOARD	VANCE CHAPMAN PUBLIC SCHOOL	1000 HURON AVENUE	THUNDER BAY	335795	5369941	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793301	LAKEHEAD DISTRICT SCHOOL BOARD	WESTGATE COLLEGIATE & VOC. INST.	707 SOUTH JAMES STREET	THUNDER BAY			L	PCB WASTE	PCB'S	ELEMT./SECON. EDUC.
ON0793301	LAKEHEAD DISTRICT SCHOOL BOARD	WESTGATE COLLEGIATE & VOC. INST.	707 SOUTH JAMES STREET	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELEMT./SECON. EDUC.
ON0793301	LAKEHEAD DISTRICT SCHOOL BOARD	WESTGATE COLLEGIATE & VOC. INST.	707 SOUTH JAMES STREET	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0793301	LAKEHEAD DISTRICT SCHOOL BOARD	WESTGATE COLLEGIATE & VOC. INST.	707 SOUTH JAMES STREET	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELEMT./SECON. EDUC.
ON0793301	LAKEHEAD DISTRICT SCHOOL BOARD	WESTGATE COLLEGIATE & VOC. INST.	707 SOUTH JAMES STREET	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELEMT./SECON. EDUC.
ON0447800	LAKEHEAD FR(OUT OF BUSINESS) 24-118	500 11TH AVENUE		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0447800	LAKEHEAD FR(OUT OF BUSINESS) 24-118	500 11TH AVENUE		THUNDER BAY			L	CORROSIVE	OTHER INORGANIC ACID WASTES	GEN. FREIGHT TRUCK.
ON0447800	LAKEHEAD FR(OUT OF BUSINESS) 24-118	500 11TH AVENUE		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	GEN. FREIGHT TRUCK.
ON0447800	LAKEHEAD FR(OUT OF BUSINESS) 24-118	500 11TH AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GEN. FREIGHT TRUCK.
ON0447801	LAKEHEAD FREIGHTWAYS INC.	161 MAIN STREET		THUNDER BAY	335246	5363934	L	CORROSIVE	OTHER INORGANIC ACID WASTES	GEN. FREIGHT TRUCK.
ON0447801	LAKEHEAD FREIGHTWAYS INC.	161 MAIN STREET		THUNDER BAY	335246	5363934	L	IGNITABLE	PETROLEUM DISTILLATES	GEN. FREIGHT TRUCK.
ON0447801	LAKEHEAD FREIGHTWAYS INC.	161 MAIN STREET		THUNDER BAY	335246	5363934	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GEN. FREIGHT TRUCK.
ON0447801	LAKEHEAD FREIGHTWAYS INC.	161 MAIN STREET		THUNDER BAY	335246	5363934	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0481300	LAKEHEAD MOTORS LIMITED, THE	951 MEMORIAL AVENUE		THUNDER BAY	333893	5364147	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON2058900	LAKEHEAD PRINTING	1184 ROLAND STREET		THUNDER BAY	332942	5363313	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	OTHER COMM. PRINTING
ON2058900	LAKEHEAD PRINTING	1184 ROLAND STREET		THUNDER BAY	332942	5363313	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	OTHER COMM. PRINTING
ON0355700	LAKEHEAD PSYCHIATRIC HOSPITAL	580 NORTH ALGOMA STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	MENTAL(PSYC) HOSP.
ON0355700	LAKEHEAD PSYCHIATRIC HOSPITAL	580 NORTH ALGOMA STREET		THUNDER BAY			S	PATHOLOGICAL	PATHOLOGICAL WASTES	MENTAL(PSYC) HOSP.
ON0452500	LAKEHEAD RENT-ALLS LIMITED 24-123	946 COBALT CRESCENT		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	IND. MACH. RENTAL
ON0452500	LAKEHEAD RENT-ALLS LIMITED 24-123	946 COBALT CRESCENT		THUNDER BAY	332980	5364316	L	IGNITABLE	LIGHT FUELS	IND. MACH. RENTAL
ON0452500	LAKEHEAD RENT-ALLS LIMITED 24-123	946 COBALT CRESCENT		THUNDER BAY	332980	5364316	L	IGNITABLE	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ON0452500	LAKEHEAD RENT-ALLS LIMITED 24-123	946 COBALT CRESCENT		THUNDER BAY	332980	5364316	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ON1481200	LAKEHEAD ROOFING&SHEET METAL CO. 24-866	(1983)LTD., 1450 ROSSLYN ROAD	R.R. #1	THUNDER BAY	327827	5359057	L	IGNITABLE	PETROLEUM DISTILLATES	SIDING WORK
ON1481200	LAKEHEAD ROOFING&SHEET METAL CO. 24-866	(1983)LTD., 1450 ROSSLYN ROAD	R.R. #1	THUNDER BAY	327827	5359057	L	IGNITABLE	LIGHT FUELS	SIDING WORK
ON1481200	LAKEHEAD ROOFING&SHEET METAL CO. 24-866	(1983)LTD., 1450 ROSSLYN ROAD	R.R. #1	THUNDER BAY	327827	5359057	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SIDING WORK
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	UNIVERSITY EDUCATION
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	UNIVERSITY EDUCATION
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	L	IGNITABLE	LIGHT FUELS	UNIVERSITY EDUCATION
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED PESTICIDES	UNIVERSITY EDUCATION
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	S	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	UNIVERSITY EDUCATION
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	UNIVERSITY EDUCATION
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	UNIVERSITY EDUCATION
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	S	PATHOLOGICAL	PATHOLOGICAL WASTES	UNIVERSITY EDUCATION
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		THUNDER BAY	332748	5365644	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	UNIVERSITY EDUCATION
ON1713300	LAKESHORE EXPRESS (THUNDER BAY) INC.	495 LAKESHORE DRIVE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LUB. OIL & GREASE
ON0941901	LBC CONTRACTING LTD	1070 GORHAM STREET		THUNDER BAY	333657	5363775	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER TRUCK./TRANS.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0941900	LBC LOGGING CONTRACTING LTD.	960B ALLOY DRIVE		THUNDER BAY	333332	5364213	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0323900	LEBRUN CONSTRUCTORS (OUT OF BUSINESS)	610 HEWITSON STREET		THUNDER BAY	333367	5363601	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	HIGHWAYS, STR., ETC.
ON0323901	LEBRUN NORTHERN CONTRACTING LTD.	1160 CARRICK STREET		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	HIGHWAYS, STR., ETC.
ON0295400	LEHTO PRINTERS LIMITED (1989)	1081 RUSSELL STREET		THUNDER BAY	333235	5363717	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	OTHER PRINTING IND.
ON0295400	LEHTO PRINTERS LIMITED (1989)	1081 RUSSELL STREET		THUNDER BAY	333235	5363717	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	OTHER PRINTING IND.
ON0316200	LEMPIALA SAND & GRAVEL LIMITED	LOT 16, NORTH HALF OF CONCESSION 2		GORHAM TWP.			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SAND & GRAVEL PITS
ON1401300	LEO SAKATA ELECTRONICS (CAN.) LTD.24-812	1239 AMBER DRIVE		THUNDER BAY	332655	5364426	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	ELECT. PARTS & COMP.
ON1401300	LEO SAKATA ELECTRONICS (CAN.) LTD.24-812	1239 AMBER DRIVE		THUNDER BAY	332655	5364426	L	FOR MANIFEST, SPECIFIC GRAVITY	ALIPHATIC SOLVENTS	ELECT. PARTS & COMP.
ON1401300	LEO SAKATA ELECTRONICS (CAN.) LTD.24-812	1239 AMBER DRIVE		THUNDER BAY	332655	5364426	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ELECT. PARTS & COMP.
ON1401300	LEO SAKATA ELECTRONICS (CAN.) LTD.24-812	1239 AMBER DRIVE		THUNDER BAY	332655	5364426	L	IGNITABLE	ALIPHATIC SOLVENTS	ELECT. PARTS & COMP.
ON1730800	LIGHTNING SALES & RENTALS INC.	1234 AMBER DRIVE		THUNDER BAY	332655	5364426	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ON0755009	LIQUOR CONTROL BOARD OF ONTARIO	LCBO WAREHOUSE-THUNDER BAY	615 HAROLD CRES.	THUNDER BAY	333014	5362510	L	IGNITABLE	ALIPHATIC SOLVENTS	LIQUOR STORES
ON1613700	LORGANSEY CONTRACTING SERVICES INC24-957	1956 DAWSON RD.		THUNDER BAY	329615	5371511	L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	HARBOUR & PORT OPER.
ON1613700	LORGANSEY CONTRACTING SERVICES INC24-957	1956 DAWSON RD.		THUNDER BAY	329615	5371511	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	HARBOUR & PORT OPER.
ON1613700	LORGANSEY CONTRACTING SERVICES INC24-957	1956 DAWSON RD.		THUNDER BAY	329615	5371511	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	HARBOUR & PORT OPER.
ON1613700	LORGANSEY CONTRACTING SERVICES INC24-957	1956 DAWSON RD.		THUNDER BAY	329615	5371511	L	IGNITABLE	OIL SKIMMINGS & SLUDGES	HARBOUR & PORT OPER.
ON0472901	LTL CONTRACTING	1186 RUSSELL STREET		THUNDER BAY	333106	5363355	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER SERVICES
ON0472900	LTL CONTRACTING LTD. 24-146	1816 PAQUETTE ROAD		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	EQUIP. RENTAL W. OP.
ON0360201	MACMILLAN BLOEDEL LIMITED	PT.LOTS 8,9,10, CONC.2 / PT.LOT 8,CONC.1	10TH SIDE ROAD, PAIPOONGE TOWNSHIP	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALKALINE WASTES - OTHER METALS	WAFER BOARD IND.
ON0360201	MACMILLAN BLOEDEL LIMITED	PT.LOTS 8,9,10, CONC.2 / PT.LOT 8,CONC.1	10TH SIDE ROAD, PAIPOONGE TOWNSHIP	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	WAFER BOARD IND.
ON0360201	MACMILLAN BLOEDEL LIMITED	PT.LOTS 8,9,10, CONC.2 / PT.LOT 8,CONC.1	10TH SIDE ROAD, PAIPOONGE TOWNSHIP	THUNDER BAY			S	PCB WASTE	PCB'S	WAFER BOARD IND.
ON0491700	MADSEN ROWLAND MINES LTD. 25-140	MADSEN ONTARIO	104 NORTH SYNDICATE AVENUE	THUNDER BAY			L	PCB WASTE	PCB'S	GOLD MINE
ON0005129	MAINTAIR AVIATION SERVICES LIMITED	316 HECTOR DOUGAL WAY		THUNDER BAY	328246	5360056	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER A.T. SERVICES
ON0005129	MAINTAIR AVIATION SERVICES LIMITED	316 HECTOR DOUGAL WAY		THUNDER BAY	328246	5360056	L	IGNITABLE	LIGHT FUELS	OTHER A.T. SERVICES
ON0348501	MANITOBA POOL ELEVATORS TERM DIVISION	100 MAUREEN STREET	POOL #3	THUNDER BAY	335456	5365506	L	IGNITABLE	PETROLEUM DISTILLATES	GRAIN ELEVATOR IND.
ON0348501	MANITOBA POOL ELEVATORS TERM DIVISION	100 MAUREEN STREET	POOL #3	THUNDER BAY	335456	5365506	S	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON0348501	MANITOBA POOL ELEVATORS TERM DIVISION	100 MAUREEN STREET	POOL #3	THUNDER BAY	335456	5365506	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GRAIN ELEVATOR IND.
ON0348500	MANITOBA POOL ELEVATORS TERM DIVISION	160 MAUREEN STREET	POOL #1	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	GRAIN ELEVATOR IND.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0348500	MANITOBA POOL ELEVATORS TERM DIVISION	160 MAUREEN STREET	POOL #1	THUNDER BAY			L	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON0348500	MANITOBA POOL ELEVATORS TERM DIVISION	160 MAUREEN STREET	POOL #1	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GRAIN ELEVATOR IND.
ON1744903	MARINE PIPELINE CONSTRUCTION OF CANADA	120 B COOPER ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER TRUCK./TRANS.
ON2292200	MATAWIN SILVICULTURE LTD.	4346 OLIVER ROAD		OLIVER PAIPOONGE TWP.			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	REFINED PETRO. PROD.
ON0116502	MCASPHALT INDUSTRIES LIMITED	305 CITY ROAD		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	PETROLEUM PROD., WH.
ON0116502	MCASPHALT INDUSTRIES LIMITED	305 CITY ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	HEAVY FUELS	PETROLEUM PROD., WH.
ON0116502	MCASPHALT INDUSTRIES LIMITED	305 CITY ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PETROLEUM PROD., WH.
ON0463302	MCKEVITT TRUCKING LIMITED	1200 CARRICK ST.		THUNDER BAY	333366	5363348	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GEN. FREIGHT TRUCK.
ON0463302	MCKEVITT TRUCKING LIMITED	1200 CARRICK ST.		THUNDER BAY	333366	5363348	L	IGNITABLE	LIGHT FUELS	GEN. FREIGHT TRUCK.
ON0463302	MCKEVITT TRUCKING LIMITED	1200 CARRICK ST.		THUNDER BAY	333366	5363348	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0463300	MCKEVITT TRUCKING LIMITED	420 FORT WILLIAM ROAD		THUNDER BAY	334752	5365661	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0116748	MDS LABORATORY SERVICES	117 SOUTH MCKELLAR STREET		THUNDER BAY	333390	5361376	S	PATHOLOGICAL	PATHOLOGICAL WASTES	MEDICAL LABORATORIES
ON0116765	MDS LABORATORY SERVICES	1265 EAST ARTHUR STREET	SUITE 400	THUNDER BAY	332980	5361117	S	PATHOLOGICAL	PATHOLOGICAL WASTES	MEDICAL LABORATORIES
ON0116746	MDS LABORATORY SERVICES	63 NORTH ALGOMA STREET		THUNDER BAY	335694	5367446	S	PATHOLOGICAL	PATHOLOGICAL WASTES	MEDICAL LABORATORIES
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	L	HAZARDOUS INDUSTRIAL WASTE	OTHER INORGANIC ACID WASTES	COMB. MED./RAD. LAB.
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	COMB. MED./RAD. LAB.
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	COMB. MED./RAD. LAB.
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	COMB. MED./RAD. LAB.
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	COMB. MED./RAD. LAB.
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	COMB. MED./RAD. LAB.
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	L	HAZARDOUS WASTE CHEMICAL	ORGANIC LABORATORY CHEMICALS	COMB. MED./RAD. LAB.
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	S	PATHOLOGICAL	PATHOLOGICAL WASTES	COMB. MED./RAD. LAB.
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT STREET	THUNDER BAY	336042	5367827	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	COMB. MED./RAD. LAB.
ON0116745	MDS LABORATORY SERVICES(OUT OF BUSINESS)	911 EAST ARTHUR STREET		THUNDER BAY	333348	5361098	S	PATHOLOGICAL	PATHOLOGICAL WASTES	MEDICAL LABORATORIES
ON1459100	MERSE MOTOR ELECTRIC LTD. 26-643	1945 COURT STREET		THUNDER BAY			S	CORROSIVE	ALKALINE WASTES - HEAVY METALS	ELECTRICAL HH. APP.
ON0423900	MIDWAY CLEANERS & TAILORS	517 SIMPSON STREET		THUNDER BAY	334343	5362160	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POWER LAUND./CLEANERS
ON0296700	MIDWEST DETROIT DIESEL LIMITED	1100 WEST WALSH STREET		THUNDER BAY	329847	5360390	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GARAGES(GEN. REPAIR)
ON0296700	MIDWEST DETROIT DIESEL LIMITED	1100 WEST WALSH STREET		THUNDER BAY	329847	5360390	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GARAGES(GEN. REPAIR)
ON0296700	MIDWEST DETROIT DIESEL LIMITED	1100 WEST WALSH STREET		THUNDER BAY	329847	5360390	L	IGNITABLE	PETROLEUM DISTILLATES	GARAGES(GEN. REPAIR)
ON2423700	MIDWEST HYDRAULICS INC.	1112 RUSSELL STREET		THUNDER BAY	333120	5363595	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER MACHINERY
ON1004105	MIN.OF NORTHERN DEVELOPMENT &MINES	CORE LIBRARY	335 EUCLID AVENUE	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	SERVICE -MINING
ON1004105	MIN.OF NORTHERN DEVELOPMENT &MINES	CORE LIBRARY	335 EUCLID AVENUE	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	SERVICE -MINING

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1004105	MIN.OF NORTHERN DEVELOPMENT &MINES	CORE LIBRARY	335 EUCLID AVENUE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	SERVICE -MINING
ON1004105	MIN.OF NORTHERN DEVELOPMENT &MINES	CORE LIBRARY	335 EUCLID AVENUE	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	SERVICE -MINING
ON0123932	MINISTRY (SEE & USE ON1964202)	THUNDER BAY CORRECTIONAL CENTRE	HWY 61 SOUTH	THUNDER BAY			S	PCB WASTE	PCB'S	CORRECTIONAL SERV.
ON0123912	MINISTRY (SEE & USE ON1964203)	500 NORTH ALGOMA STREET		THUNDER BAY	336996	5368815	S	PCB WASTE	PCB'S	HOUSING ADMIN.
ON0123912	MINISTRY (SEE & USE ON1964203)	500 NORTH ALGOMA STREET		THUNDER BAY	336996	5368815	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	HOUSING ADMIN.
ON0199891	MINISTRY OF (OUT OF BUSINESS)	NORTHERN WOOD PRESERVERS INC.	MAUREEN STREET	THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	PHENOLIC WASTES	WOOD PRESERVATION
ON0199216	MINISTRY OF AGRIC. (OUT OF BUSINESS)	THUNDER BAY CROP RESEARCH STATION	PART OF LOT 25, CONCESSION 5	NEEBINC TWP.			L	ACUTELY HAZARDOUS WASTE CHEM.	NON-HALOGENATED PESTICIDES	OTHER UTILITY IND.
ON0199216	MINISTRY OF AGRIC. (OUT OF BUSINESS)	THUNDER BAY CROP RESEARCH STATION	PART OF LOT 25, CONCESSION 5	NEEBINC TWP.			L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED PESTICIDES	OTHER UTILITY IND.
ON0199216	MINISTRY OF AGRIC. (OUT OF BUSINESS)	THUNDER BAY CROP RESEARCH STATION	PART OF LOT 25, CONCESSION 5	NEEBINC TWP.			L	FOR MANIFEST, SPECIFIC GRAVITY	HALOGENATED PESTICIDES	OTHER UTILITY IND.
ON0199216	MINISTRY OF AGRIC. (OUT OF BUSINESS)	THUNDER BAY CROP RESEARCH STATION	PART OF LOT 25, CONCESSION 5	NEEBINC TWP.			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	OTHER UTILITY IND.
ON0199216	MINISTRY OF AGRIC. (OUT OF BUSINESS)	THUNDER BAY CROP RESEARCH STATION	PART OF LOT 25, CONCESSION 5	NEEBINC TWP.			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	OTHER UTILITY IND.
ON0199216	MINISTRY OF AGRIC. (OUT OF BUSINESS)	THUNDER BAY CROP RESEARCH STATION	PART OF LOT 25, CONCESSION 5	NEEBINC TWP.			L	LIQUID INDUSTRIAL WASTE	HALOGENATED PESTICIDES	OTHER UTILITY IND.
ON0323502	MINISTRY OF CORRECTIONAL SERVICES	THUNDER BAY JAIL		THUNDER BAY			S	PATHOLOGICAL	PATHOLOGICAL WASTES	CORRECTIONAL SERV.
ON1289602	MINISTRY OF EDUCATION & TRAINING	189 RED RIVER ROAD, 4TH FLOOR		THUNDER BAY	335870	5366916	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	SOCIAL SERV. ADMIN.
ON0124010	MINISTRY OF HEALTH	THUNDER BAY PUBLIC HEALTH LABORATORY	336 SOUTH SYNDICATE AVENUE	THUNDER BAY	333592	5360920	L	PATHOLOGICAL	PATHOLOGICAL WASTES	PUBLIC HEALTH LAB.
ON0124010	MINISTRY OF HEALTH	THUNDER BAY PUBLIC HEALTH LABORATORY	336 SOUTH SYNDICATE AVENUE	THUNDER BAY	333592	5360920	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	PUBLIC HEALTH LAB.
ON0067904	MINISTRY OF LABOUR, ONTARIO	HEALTH & SAFETY SUPPORT SERVICES BRANCH	435 JAMES STREET SOUTH	THUNDER BAY	330362	5360900	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	RADIOLOGICAL LAB.
ON0124163	MINISTRY OF NATURAL (OUT OF BUSINESS)	OMNR REGIONAL SERVICE CENTRE	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	OTHER GEN. ADMIN.
ON0124163	MINISTRY OF NATURAL (OUT OF BUSINESS)	OMNR REGIONAL SERVICE CENTRE	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	FOR MANIFEST, SPECIFIC GRAVITY	ALIPHATIC SOLVENTS	OTHER GEN. ADMIN.
ON0124163	MINISTRY OF NATURAL (OUT OF BUSINESS)	OMNR REGIONAL SERVICE CENTRE	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	OTHER GEN. ADMIN.
ON0124163	MINISTRY OF NATURAL (OUT OF BUSINESS)	OMNR REGIONAL SERVICE CENTRE	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	IGNITABLE	ALIPHATIC SOLVENTS	OTHER GEN. ADMIN.
ON0124163	MINISTRY OF NATURAL (OUT OF BUSINESS)	OMNR REGIONAL SERVICE CENTRE	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	FOR MANIFEST, SPECIFIC GRAVITY	HALOGENATED PESTICIDES	OTHER GEN. ADMIN.
ON0124163	MINISTRY OF NATURAL (OUT OF BUSINESS)	OMNR REGIONAL SERVICE CENTRE	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	HAZARDOUS WASTE CHEMICAL	HALOGENATED PESTICIDES	OTHER GEN. ADMIN.
ON0124163	MINISTRY OF NATURAL (OUT OF BUSINESS)	OMNR REGIONAL SERVICE CENTRE	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	OTHER GEN. ADMIN.
ON0124163	MINISTRY OF NATURAL (OUT OF BUSINESS)	OMNR REGIONAL SERVICE CENTRE	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	LIQUID INDUSTRIAL WASTE	HALOGENATED PESTICIDES	OTHER GEN. ADMIN.
ON0001541	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD	CURRENT RIVER FACILITY-OMNR	THUNDER BAY	339212	5369181	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	RES. CONS./IND. DEV.
ON0001541	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD	CURRENT RIVER FACILITY-OMNR	THUNDER BAY	339212	5369181	L	IGNITABLE	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0001541	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD	CURRENT RIVER FACILITY-OMNR	THUNDER BAY	339212	5369181	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0001541	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD	CURRENT RIVER FACILITY-OMNR	THUNDER BAY	339212	5369181	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	RES. CONS./IND. DEV.
ON0124172	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0124172	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	RES. CONS./IND. DEV.
ON0124172	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	RES. CONS./IND. DEV.
ON0124172	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	RES. CONS./IND. DEV.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0124172	MINISTRY OF NATURAL RESOURCES	531 SHIPYARD ROAD		THUNDER BAY			S	LEACHATE TOXIC	NON-HALOGENATED PESTICIDES	RES. CONS./IND. DEV.
ON0001549	MINISTRY OF NATURAL RESOURCES	CENTRE FOR NORTHERN FOREST ECOSYSTEM	RESEARCH BUILDING LAKEHEAD UNIVERSITY	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	RES. CONS./IND. DEV.
ON0001549	MINISTRY OF NATURAL RESOURCES	CENTRE FOR NORTHERN FOREST ECOSYSTEM	RESEARCH BUILDING LAKEHEAD UNIVERSITY	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0001549	MINISTRY OF NATURAL RESOURCES	CENTRE FOR NORTHERN FOREST ECOSYSTEM	RESEARCH BUILDING LAKEHEAD UNIVERSITY	THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	HALOGENATED PESTICIDES	RES. CONS./IND. DEV.
ON0001549	MINISTRY OF NATURAL RESOURCES	CENTRE FOR NORTHERN FOREST ECOSYSTEM	RESEARCH BUILDING LAKEHEAD UNIVERSITY	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	RES. CONS./IND. DEV.
ON0124122	MINISTRY OF NATURAL RESOURCES	DORION FISH CULTURE STATION	LOT 5, CONCESSION 21	DORION			L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0124184	MINISTRY OF NATURAL RESOURCES	HWY 587 - 30 KM SOUTH OF PASS LAKE	SLEEPING GIANT PROVINCIAL PARK	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	RES. CONS./IND. DEV.
ON0124184	MINISTRY OF NATURAL RESOURCES	HWY 587 - 30 KM SOUTH OF PASS LAKE	SLEEPING GIANT PROVINCIAL PARK	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	RES. CONS./IND. DEV.
ON0124184	MINISTRY OF NATURAL RESOURCES	HWY 587 - 30 KM SOUTH OF PASS LAKE	SLEEPING GIANT PROVINCIAL PARK	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	RES. CONS./IND. DEV.
ON0001530	MINISTRY OF NATURAL RESOURCES	MNR FLEET FACILITY	615 SOUTH JAMES STREET VIA MOUNTDALE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0001530	MINISTRY OF NATURAL RESOURCES	MNR FLEET FACILITY	615 SOUTH JAMES STREET VIA MOUNTDALE	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	RES. CONS./IND. DEV.
ON0001530	MINISTRY OF NATURAL RESOURCES	MNR FLEET FACILITY	615 SOUTH JAMES STREET VIA MOUNTDALE	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	RES. CONS./IND. DEV.
ON0001530	MINISTRY OF NATURAL RESOURCES	MNR FLEET FACILITY	615 SOUTH JAMES STREET VIA MOUNTDALE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	RES. CONS./IND. DEV.
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	RES. CONS./IND. DEV.
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	RES. CONS./IND. DEV.
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	IGNITABLE	LIGHT FUELS	RES. CONS./IND. DEV.
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	IGNITABLE	PETROLEUM DISTILLATES	RES. CONS./IND. DEV.
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	FOR MANIFEST, SPECIFIC GRAVITY	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR STREET	THUNDER BAY	327331	5361031	L	IGNITABLE	ALIPHATIC SOLVENTS	RES. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	REG. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	L	HAZARDOUS WASTE CHEMICAL	HALOGENATED PESTICIDES	REG. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	L	IGNITABLE	PETROLEUM DISTILLATES	REG. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	L	LIQUID INDUSTRIAL WASTE	POLYMERIC RESINS	REG. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	L	FOR MANIFEST, SPECIFIC GRAVITY	NON-HALOGENATED PESTICIDES	REG. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	REG. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	REG. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	L	LIQUID INDUSTRIAL WASTE	NON-HALOGENATED PESTICIDES	REG. CONS./IND. DEV.
ON0124105	MINISTRY OF NATURAL RESOURCES	THUNDER BAY FOREST NURSERY	ROSSLYN ROAD & 25TH SIDE ROAD	PAIPOONGE TOWNSHIP	323036	5359347	S	HAZARDOUS WASTE CHEMICAL	NON-HALOGENATED PESTICIDES	REG. CONS./IND. DEV.
ON0958300	MINISTRY OF REVENUE 27-396	THUNDER BAY REGIONAL ASSESSMENT REG. 32	189 RED RIVER ROAD	THUNDER BAY	335870	5366916	L	CORROSIVE	PHOTOPROCESSING WASTES	TAXATION ADMIN.
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	PUBLIC HEALTH LAB.
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			L	CORROSIVE	ACID WASTE - HEAVY METALS	PUBLIC HEALTH LAB.
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	ALKALINE WASTES - HEAVY METALS	PUBLIC HEALTH LAB.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	PUBLIC HEALTH LAB.
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	PUBLIC HEALTH LAB.
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	PUBLIC HEALTH LAB.
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			S	PCB WASTE	PCB'S	PUBLIC HEALTH LAB.
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	PUBLIC HEALTH LAB.
ON0199813	MINISTRY OF THE ENVIRONMENT	ONTARIO GOVERNMENT BUILDING	421 JAMES STREET SOUTH	THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	HALOGENATED PESTICIDES	PUBLIC HEALTH LAB.
ON0134805	MINISTRY OF THE SOLICITOR GENERAL	489 NORTH ALGOMA STREET		THUNDER BAY	337103	5368703	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	POLICE SERVICES
ON0134805	MINISTRY OF THE SOLICITOR GENERAL	489 NORTH ALGOMA STREET		THUNDER BAY	337103	5368703	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	POLICE SERVICES
ON0134805	MINISTRY OF THE SOLICITOR GENERAL	489 NORTH ALGOMA STREET		THUNDER BAY	337103	5368703	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POLICE SERVICES
ON0134805	MINISTRY OF THE SOLICITOR GENERAL	489 NORTH ALGOMA STREET		THUNDER BAY	337103	5368703	L	IGNITABLE	PETROLEUM DISTILLATES	POLICE SERVICES
ON0282602	MINISTRY OF TOURISM & RECREATION	OLD FORT WILLIAM, KING'S ROAD	1/2 MILE N. OF BROADWAY AVENUE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	NON-HALOGENATED PESTICIDES	REC./CULTURE ADMIN.
ON0282602	MINISTRY OF TOURISM & RECREATION	OLD FORT WILLIAM, KING'S ROAD	1/2 MILE N. OF BROADWAY AVENUE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	REC./CULTURE ADMIN.
ON0282602	MINISTRY OF TOURISM & RECREATION	OLD FORT WILLIAM, KING'S ROAD	1/2 MILE N. OF BROADWAY AVENUE	THUNDER BAY			L	LEACHATE TOXIC	PAINT/PIGMENT/COATING RESIDUES	REC./CULTURE ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			S	PCB WASTE	PCB'S	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	ALIPHATIC SOLVENTS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	IGNITABLE	ALIPHATIC SOLVENTS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	LIGHT FUELS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	HEAVY FUELS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	HEAVY FUELS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	IGNITABLE	HEAVY FUELS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	HEAVY FUELS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	POLYMERIC RESINS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	LIGHT FUELS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	CORROSIVE	ACID WASTE - HEAVY METALS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	CORROSIVE	ACID WASTE - OTHER METALS	TRANS./COMM. ADMIN.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	ALKALINE WASTES - OTHER METALS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	CORROSIVE	ALKALINE WASTES - OTHER METALS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALKALINE WASTES - OTHER METALS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	NEUTRALIZED WASTES - OTHER METALS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	REGISTERABLE SOLID WASTE	PAINT/PIGMENT/COATING RESIDUES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			S	LEACHATE TOXIC	PAINT/PIGMENT/COATING RESIDUES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	PAINT/PIGMENT/COATING RESIDUES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OTHER SPECIFIED INORGANICS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			S	FOR MANIFEST, SPECIFIC GRAVITY	OTHER SPECIFIED INORGANICS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	BRINES, CHLOR-ALKALI WASTES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	PCB WASTE	PCB'S	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	DETERGENTS/SOAPS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	TRANS./COMM. ADMIN.
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	ACID WASTE - HEAVY METALS	TRANS./COMM. ADMIN.
ON0783501	MINISTRY(OUT OF BUSINESS)IVER SITIE27-465	230 PARK AVE KESKUS MALL LOWER LEVEL	STUDENT AWARDS BRANCH	THUNDER BAY	335698	5366978	L	IGNITABLE	PETROLEUM DISTILLATES	SOCIAL SERV. ADMIN.
ON0109302	MOTORWAYS	470 BALMORAL STREET		THUNDER BAY	332877	5362316	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0479900	MR. C. DRYCLEANERS & LAUNDERERS LTD.	269 RED RIVER ROAD		THUNDER BAY	335564	5367129	S	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	OTHER LAUND. SERV.
ON0296200	NEEBING, CORPORATION OF THE MUNICIPALITY	LOT 2, CONCESSION 3		CROOKS TOWNSHIP			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FINAN./ECON. ADMIN.
ON1542401	NESTE CHEMICALS CANADA INC.	1100 MONTREAL STREET		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	AMINES	PLASTIC & SYN. RESIN
ON1542401	NESTE CHEMICALS CANADA INC.	1100 MONTREAL STREET		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	ORGANIC LABORATORY CHEMICALS	PLASTIC & SYN. RESIN
ON1542401	NESTE CHEMICALS CANADA INC.	1100 MONTREAL STREET		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	OTHER INORGANIC ACID WASTES	PLASTIC & SYN. RESIN
ON1542401	NESTE CHEMICALS CANADA INC.	1100 MONTREAL STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	AROMATIC SOLVENTS	PLASTIC & SYN. RESIN
ON1542401	NESTE CHEMICALS CANADA INC.	1100 MONTREAL STREET		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	AROMATIC SOLVENTS	PLASTIC & SYN. RESIN
ON1542401	NESTE CHEMICALS CANADA INC.	1100 MONTREAL STREET		THUNDER BAY			S	HAZARDOUS INDUSTRIAL WASTE	POLYMERIC RESINS	PLASTIC & SYN. RESIN
ON1542401	NESTE CHEMICALS CANADA INC.	1100 MONTREAL STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PLASTIC & SYN. RESIN

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON2259800	NIDERO CONSTRUCTION (OUT OF BUSINESS)	1520 DAWSON ROAD		THUNDER BAY	331374	5370404	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER IND. CONSTR.
ON2259800	NIDERO CONSTRUCTION (OUT OF BUSINESS)	1520 DAWSON ROAD		THUNDER BAY	331374	5370404	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER IND. CONSTR.
ON2259801	NIDERO CONSTRUCTION LIMITED	160 ALTON ROAD		THUNDER BAY	324601	5374930	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER IND. CONSTR.
ON2259801	NIDERO CONSTRUCTION LIMITED	160 ALTON ROAD		THUNDER BAY	324601	5374930	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER IND. CONSTR.
ON0421104	NORANDA MINING AND EXPLORATION INC.	960 ALLOY DRIVE		THUNDER BAY	333332	5364213	L	IGNITABLE	LIGHT FUELS	COPPER/ZINC MINE
ON2102500	NORSHORE READY CONCRETE PRODUCTS LTD.	610 HEWITSON STREET		THUNDER BAY	333361	5363586	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	READY-MIX CONCRETE
ON0397600	NORTH WEST HYDRAULICS LTD	1095 ROLAND STREET		THUNDER BAY	333029	5363678	L	HAZARDOUS INDUSTRIAL WASTE	NEUTRALIZED WASTES - HEAVY METALS	MACHINE SHOP IND.
ON0397600	NORTH WEST HYDRAULICS LTD	1095 ROLAND STREET		THUNDER BAY	333029	5363678	L	IGNITABLE	PETROLEUM DISTILLATES	MACHINE SHOP IND.
ON0397600	NORTH WEST HYDRAULICS LTD	1095 ROLAND STREET		THUNDER BAY	333029	5363678	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	MACHINE SHOP IND.
ON0397600	NORTH WEST HYDRAULICS LTD	1095 ROLAND STREET		THUNDER BAY	333029	5363678	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	MACHINE SHOP IND.
ON0442900	NORTHERN WOOD 28-114	1 MAUREEN STREET		THUNDER BAY			L	LEACHATE TOXIC	ACID WASTE - HEAVY METALS	WOOD PRESERVATION
ON0442900	NORTHERN WOOD 28-114	1 MAUREEN STREET		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	WOOD PRESERVATION
ON0442900	NORTHERN WOOD 28-114	1 MAUREEN STREET		THUNDER BAY			L	PCB WASTE	PCB'S	WOOD PRESERVATION
ON0442900	NORTHERN WOOD 28-114	1 MAUREEN STREET		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	WOOD PRESERVATION
ON0442900	NORTHERN WOOD 28-114	1 MAUREEN STREET		THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	PHENOLIC WASTES	WOOD PRESERVATION
ON0442900	NORTHERN WOOD 28-114	1 MAUREEN STREET		THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	OTHER SPECIFIED ORGANICS	WOOD PRESERVATION
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		THUNDER BAY	331338	5364393	L	CORROSIVE	PHOTOPROCESSING WASTES	OTHER METAL FAB. IND.
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		THUNDER BAY	331338	5364393	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	OTHER METAL FAB. IND.
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		THUNDER BAY	331338	5364393	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER METAL FAB. IND.
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		THUNDER BAY	331338	5364393	L	IGNITABLE	AROMATIC SOLVENTS	OTHER METAL FAB. IND.
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		THUNDER BAY	331338	5364393	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	OTHER METAL FAB. IND.
ON1755600	NORTHWEST PREMIER AUTO LTD.	330 MEMORIAL AVENUE		THUNDER BAY	334676	5366123	L	LIQUID INDUSTRIAL WASTE	LIGHT FUELS	MOTOR VEHICLE IND.
ON1755600	NORTHWEST PREMIER AUTO LTD.	330 MEMORIAL AVENUE		THUNDER BAY	334676	5366123	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	MOTOR VEHICLE IND.
ON1755600	NORTHWEST PREMIER AUTO LTD.	330 MEMORIAL AVENUE		THUNDER BAY	334676	5366123	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	MOTOR VEHICLE IND.
ON0928900	NORWAY TIMBER LTD. 28-418	PTLT 5, C. 3, N. OF KAM RIVER PAIPOONGE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST PROD. TRUCK.
ON1379400	O.E. HAMLYN DRILLERS LTD. 29-532	1439 ROSSLYN RD.		THUNDER BAY	327818	5359263	L	IGNITABLE	PETROLEUM DISTILLATES	OTHER IND. CONSTR.
ON1379400	O.E. HAMLYN DRILLERS LTD. 29-532	1439 ROSSLYN RD.		THUNDER BAY	327818	5359263	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER IND. CONSTR.
ON1379400	O.E. HAMLYN DRILLERS LTD. 29-532	1439 ROSSLYN RD.		THUNDER BAY	327818	5359263	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER IND. CONSTR.
ON1803300	OFFICE SUPPLIER, THE	905A COPPER CRESCENT		THUNDER BAY	333153	5364665	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	OTHER OFFICE FURN.
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	FOR MANIFEST, SPECIFIC GRAVITY	ALIPHATIC SOLVENTS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	PCB WASTE	PCB'S	CEREAL GRAIN FLOUR

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	FOR MANIFEST, SPECIFIC GRAVITY	ORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	ACUTELY HAZARDOUS WASTE CHEM.	NON-HALOGENATED PESTICIDES	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	S	LEACHATE TOXIC	INORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	CORROSIVE	ACID WASTE - HEAVY METALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	CORROSIVE	ACID WASTE - OTHER METALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	FOR MANIFEST, SPECIFIC GRAVITY	ALKALINE WASTES - OTHER METALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	S	CORROSIVE	ALKALINE WASTES - OTHER METALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	CORROSIVE	ALKALINE PHOSPHATES	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	FOR MANIFEST, SPECIFIC GRAVITY	INORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0276000	OGILVIE MILLS (SEE&USE ON0999602)	675 NEW VICKERS STREET		THUNDER BAY	333272	5360244	S	HAZARDOUS INDUSTRIAL WASTE	INORGANIC LABORATORY CHEMICALS	CEREAL GRAIN FLOUR
ON0321000	OLIVER, TOWNSHIP OF	MUNICIPAL GARAGE		OLIVER			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0018449	ONTARIO HYDRO	167 B BURWOOD ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0018449	ONTARIO HYDRO	167 B BURWOOD ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ELECT. POWER SYS.
ON0018449	ONTARIO HYDRO	167 B BURWOOD ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0018449	ONTARIO HYDRO	167 B BURWOOD ROAD		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON0490521	ONTARIO HYDRO 45-234	34 NORTH CUMBERLAND STREET		THUNDER BAY			L	CORROSIVE	PHOTOPROCESSING WASTES	ELECT. POWER SYS.
ON0490034	ONTARIO HYDRO HELICOPTER SECTION	KELNER PILATUS HANGER/THUNDER BAY AIRPT.	317 HECTOR DOUGALL WAY	THUNDER BAY	328249	5360039	L	IGNITABLE	LIGHT FUELS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	FOR MANIFEST, SPECIFIC GRAVITY	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	IGNITABLE	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	CORROSIVE	ACID WASTE - HEAVY METALS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	ELECT. POWER SYS.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	IGNITABLE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	IGNITABLE	LIGHT FUELS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	LIQUID INDUSTRIAL WASTE	HALOGENATED SOLVENTS	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	L	PCB WASTE	PCB'S	ELECT. POWER SYS.
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		THUNDER BAY	331446	5364686	S	PCB WASTE	PCB'S	ELECT. POWER SYS.
ON0018457	ONTARIO HYDRO SERVICES COMPANY	2714 WEST ARTHUR STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ELECT. POWER SYS.
ON0018457	ONTARIO HYDRO SERVICES COMPANY	2714 WEST ARTHUR STREET		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON0018457	ONTARIO HYDRO SERVICES COMPANY	2714 WEST ARTHUR STREET		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	CORROSIVE	ACID WASTE - HEAVY METALS	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	S	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	FOR MANIFEST, SPECIFIC GRAVITY	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	IGNITABLE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	ELECT. POWER SYS.
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD	THUNDER BAY	331340	5365005	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	NEUTRALIZED WASTES - OTHER METALS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			S	REGISTERABLE SOLID WASTE	OTHER SPECIFIED INORGANICS	ELECT. POWER SYS.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OTHER SPECIFIED INORGANICS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	INORGANIC LABORATORY CHEMICALS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			S	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	HALOGENATED SOLVENTS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	HALOGENATED SOLVENTS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	PCB WASTE	PCB'S	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			S	PCB WASTE	PCB'S	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			S	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			G	ACUTELY HAZARDOUS WASTE CHEM.	WASTE COMPRESSED GASES	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ELECT. POWER SYS.
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND	THUNDER BAY			L	CORROSIVE	ACID WASTE - OTHER METALS	ELECT. POWER SYS.
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		THUNDER BAY	329827	5360628	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ELECT. POWER SYS.
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		THUNDER BAY	329827	5360628	L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		THUNDER BAY	329827	5360628	L	IGNITABLE	LIGHT FUELS	ELECT. POWER SYS.
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		THUNDER BAY	329827	5360628	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	ELECT. POWER SYS.
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		THUNDER BAY	329827	5360628	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		THUNDER BAY	329827	5360628	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		THUNDER BAY	329827	5360628	L	CORROSIVE	ACID WASTE - HEAVY METALS	ELECT. POWER SYS.
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		THUNDER BAY	329827	5360628	L	IGNITABLE	AROMATIC SOLVENTS	ELECT. POWER SYS.
ON0490036	ONTARIO HYDRO/NORTHWEST HYDRO	918 COBALT CRESCENT	THUNDER BAY GARAGE	THUNDER BAY	333084	5364485	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0490036	ONTARIO HYDRO/NORTHWEST HYDRO	918 COBALT CRESCENT	THUNDER BAY GARAGE	THUNDER BAY	333084	5364485	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ELECT. POWER SYS.
ON0490036	ONTARIO HYDRO/NORTHWEST HYDRO	918 COBALT CRESCENT	THUNDER BAY GARAGE	THUNDER BAY	333084	5364485	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0490036	ONTARIO HYDRO/NORTHWEST HYDRO	918 COBALT CRESCENT	THUNDER BAY GARAGE	THUNDER BAY	333084	5364485	L	IGNITABLE	PETROLEUM DISTILLATES	ELECT. POWER SYS.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON2409300	ONTARIO POWER GENERATION INC.	NORTHWEST PLANT GROUP HEADQUARTERS	167 BURWOOD ROAD	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON2409300	ONTARIO POWER GENERATION INC.	NORTHWEST PLANT GROUP HEADQUARTERS	167 BURWOOD ROAD	THUNDER BAY			L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON2409300	ONTARIO POWER GENERATION INC.	NORTHWEST PLANT GROUP HEADQUARTERS	167 BURWOOD ROAD	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	ELECT. POWER SYS.
ON2409300	ONTARIO POWER GENERATION INC.	NORTHWEST PLANT GROUP HEADQUARTERS	167 BURWOOD ROAD	THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	ELECT. POWER SYS.
ON2409300	ONTARIO POWER GENERATION INC.	NORTHWEST PLANT GROUP HEADQUARTERS	167 BURWOOD ROAD	THUNDER BAY			S	LEACHATE TOXIC	OTHER SPECIFIED INORGANICS	ELECT. POWER SYS.
ON2409300	ONTARIO POWER GENERATION INC.	NORTHWEST PLANT GROUP HEADQUARTERS	167 BURWOOD ROAD	THUNDER BAY			S	CORROSIVE	ACID WASTE - HEAVY METALS	ELECT. POWER SYS.
ON1964203	ONTARIO REALTY CORPORATION	500 NORTH ALGOMA STREET		THUNDER BAY			S	PCB WASTE	PCB'S	HOUSING ADMIN.
ON1964202	ONTARIO REALTY CORPORATION	THUNDER BAY CORRECTIONAL CENTRE	HIGHWAY 61 SOUTH	THUNDER BAY			S	PCB WASTE	PCB'S	CORRECTIONAL SERV.
ON1985000	OUTLAND NEW FOREST CONTRACTING	5130 DAWSON ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST SERVICES
ON1985000	OUTLAND NEW FOREST CONTRACTING	5130 DAWSON ROAD		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	FOREST SERVICES
ON1985000	OUTLAND NEW FOREST CONTRACTING	5130 DAWSON ROAD		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	FOREST SERVICES
ON1573700	P&G CONSTRUCTION CO. 30-920	758 MACDONELL STREET		THUNDER BAY	333922	5364955	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FORM WORK
ON0751400	PAIPOONGE, MUNICIPALITY OF	LOT 19, CONC A	LOT 19, CONC. A	PAIPOONGE			L	IGNITABLE	PETROLEUM DISTILLATES	TRANSPORTATION ADMIN.
ON0751400	PAIPOONGE, MUNICIPALITY OF	LOT 19, CONC A	LOT 19, CONC. A	PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0751401	PAIPOONGE, MUNICIPALITY OF	LOT 33, CONCESSION 2, HIGHWAY 588	NOR-WEST RECREATION CENTRE	PAIPOONGE TWP.			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	REC./CULTURE ADMIN.
ON0462700	PALM DAIRIES LTD. 30-099		640 BALMORAL STREET, P.O. BOX 338	THUNDER BAY	332884	5362530	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	FLUID MILK IND.
ON0911500	PARAMOUNT TRANSPORTATION LTD. 30-304		2781 ARTHUR ST., HWY. 17	PAIPOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	TRUCK & BUS BODY
ON2179700	PARRISH & HEIMBECKER LTD.	101 MAUREEN STREET		THUNDER BAY			L	IGNITABLE	WASTE OILS & LUBRICANTS	OTHER SERVICES
ON2179700	PARRISH & HEIMBECKER LTD.	101 MAUREEN STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER SERVICES
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	CORROSIVE	ACID WASTE - OTHER METALS	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	CORROSIVE	OTHER INORGANIC ACID WASTES	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	LIGHT FUELS	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			S	PCB WASTE	PCB'S	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	SHIPBUILDING/REPAIR
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	HEAVY FUELS	SHIPBUILDING/REPAIR
ON0499104	PERTH SERVICES LTD.	339 MEMORIAL AVENUE		THUNDER BAY	334630	5365891	S	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POWER LAUND./CLEANERS
ON0499105	PERTH SERVICES LTD. 30-275	GREEN ACRES SHOPPING CENTRE	115 WEST ARTHUR	THUNDER BAY	331243	5361214	S	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	IND./HOUSEHOLD CHEM.
ON1589405	PETER KIEWIT SONS CO. LTD.	DOG LAKE DAM	SILVERFALLS ROAD	THUNDER BAY DISTRICT			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	EXCAVAT. & GRADING
ON1589405	PETER KIEWIT SONS CO. LTD.	DOG LAKE DAM	SILVERFALLS ROAD	THUNDER BAY DISTRICT			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	EXCAVAT. & GRADING
ON1561100	PETERSON ELECTRIC CO. LIMITED	142 NORTH CUMBERLAND STREET	P.O. BOX 2985	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER ELECT. EQUIP.
ON0031025	PETRO-CANADA PRODUCTS	DISTRIBUTION TERMINAL	300-106TH STREET , MISSION ISLAND	THUNDER BAY	333983	5360175	L	IGNITABLE	LIGHT FUELS	REFINED PETRO. PROD.
ON0031025	PETRO-CANADA PRODUCTS	DISTRIBUTION TERMINAL	300-106TH STREET , MISSION ISLAND	THUNDER BAY	333983	5360175	L	IGNITABLE	OIL SKIMMINGS & SLUDGES	REFINED PETRO. PROD.
ON1607900	PIERRE GAGNE (OUT OF BUS) 30-952	1570 DAWSON RD. SITE 10,BOX29,RR#12	C/O 580 VICKERS ST.	THUNDER BAY	331198	5370471	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	HIGHWAYS, STR., ETC.

Table H-6
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GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1607901	PIERRE GAGNE CONTRACTING LTD	580 NEW VICKERS STREET		THUNDER BAY	333284	5360220	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	HIGHWAYS, STR., ETC.
ON1607901	PIERRE GAGNE CONTRACTING LTD	580 NEW VICKERS STREET		THUNDER BAY	333284	5360220	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	HIGHWAYS, STR., ETC.
ON0938400	PINE RIVER TRANSPORT INC.	1320 WALLBRIDGE AVENUE		THUNDER BAY	329451	5359588	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0742800	POLLARD HIGHWAY PRODUCTS	MISSION TERMINAL	40 DAREL STREET	THUNDER BAY	333928	5358479	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	BULK LIQ. TRUCKING
ON0742800	POLLARD HIGHWAY PRODUCTS	MISSION TERMINAL	40 DAREL STREET	THUNDER BAY	333928	5358479	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	BULK LIQ. TRUCKING
ON0353800	PORT (SEE & USE ON0330901)	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	L	LIQUID INDUSTRIAL WASTE	HEAVY FUELS	GENERAL HOSPITALS
ON0353800	PORT (SEE & USE ON0330901)	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	GENERAL HOSPITALS
ON0353800	PORT (SEE & USE ON0330901)	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	S	PCB WASTE	PCB'S	GENERAL HOSPITALS
ON0353800	PORT (SEE & USE ON0330901)	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	GENERAL HOSPITALS
ON0353800	PORT (SEE & USE ON0330901)	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	S	PATHOLOGICAL	PATHOLOGICAL WASTES	GENERAL HOSPITALS
ON2119600	PORT ARTHUR CURLING & ATHLETIC CLUB	214 EGAN STREET		THUNDER BAY	336831	5368125	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CURLING CLUBS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	IGNITABLE	LIGHT FUELS	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	IGNITABLE	HEAVY FUELS	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	LEACHATE TOXIC	EMULSIFIED OILS	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	LEACHATE TOXIC	TRANSFER STATION OILS WASTES	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	HAZARDOUS WASTE CHEMICAL	AROMATIC SOLVENTS	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	LIQUID INDUSTRIAL WASTE	INERT INORGANIC WASTES	OTHER WASTE MATERIALS
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST	PAIPOONGE TWP			L	IGNITABLE	PETROLEUM DISTILLATES	OTHER WASTE MATERIALS
ON0415100	POWELL EQUIP (1978) LTD 31-113		620 BEAVERHALL PLACE	THUNDER BAY	329877	5360853	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	CONSTRTUCTION EQUIP.
ON0415100	POWELL EQUIP (1978) LTD 31-113		620 BEAVERHALL PLACE	THUNDER BAY	329877	5360853	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTRTUCTION EQUIP.
ON0415100	POWELL EQUIP (1978) LTD 31-113		620 BEAVERHALL PLACE	THUNDER BAY	329877	5360853	L	LIQUID INDUSTRIAL WASTE	OTHER SPECIFIED INORGANICS	CONSTRTUCTION EQUIP.
ON0415100	POWELL EQUIP (1978) LTD 31-113		620 BEAVERHALL PLACE	THUNDER BAY	329877	5360853	L	LIQUID INDUSTRIAL WASTE	ALKALINE WASTES - OTHER METALS	CONSTRTUCTION EQUIP.
ON0415100	POWELL EQUIP (1978) LTD 31-113		620 BEAVERHALL PLACE	THUNDER BAY	329877	5360853	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	CONSTRTUCTION EQUIP.
ON1670806	PRAXAIR CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	IND. INORGANIC CHEM.
ON1670806	PRAXAIR CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	IND. INORGANIC CHEM.
ON1670806	PRAXAIR CANADA INC.	2001 NEEBING AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. INORGANIC CHEM.
ON1354001	PRO-TECH INDUSTRIAL GROUP	402 KINGSTON STREET		THUNDER BAY	330527	5359007	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	OTHER SCI./TECH. OF.
ON1354001	PRO-TECH INDUSTRIAL GROUP	402 KINGSTON STREET		THUNDER BAY	330527	5359007	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	OTHER SCI./TECH. OF.
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER PAPER IND.
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ORGANIC LABORATORY CHEMICALS	OTHER PAPER IND.
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	ORGANIC LABORATORY CHEMICALS	OTHER PAPER IND.
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	IGNITABLE	WASTE OILS & LUBRICANTS	OTHER PAPER IND.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	IGNITABLE	POLYMERIC RESINS	OTHER PAPER IND.
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	POLYMERIC RESINS	OTHER PAPER IND.
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	OTHER PAPER IND.
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OTHER SPECIFIED INORGANICS	OTHER PAPER IND.
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	OTHER PAPER IND.
ON0144750	PUBLIC WORKS CANADA	221 ARCHIBALD STREET		THUNDER BAY			S	PCB WASTE	PCB'S	OTHER GEN. ADMIN.
ON0316300	R.A. MILNE CRUSHING (OUT OF BUSINESS)	SCREENING CONT	RR #16	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SAND & GRAVEL PITS
ON1387601	R.A. WARREN (OUT OF BUSINESS)NTAL S LTD.	1319 WEST FRANCIS STREET		THUNDER BAY	329545	5359704	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	EQUIP. RENTAL W. OP.
ON1387600	R.A. WARREN CONSTRUCTION & RENTALS LTD.	556 TENTH AVENUE		THUNDER BAY	333682	5364555	L	IGNITABLE	WASTE OILS & LUBRICANTS	EQUIP. RENTAL W. OP.
ON1935800	RAINBOW PRINTERS LTD.	380 MOONEY STREET		THUNDER BAY	334405	5364148	L	LIQUID INDUSTRIAL WASTE	PHOTOPROCESSING WASTES	OTHER COMM. PRINTING
ON1935800	RAINBOW PRINTERS LTD.	380 MOONEY STREET		THUNDER BAY	334405	5364148	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	OTHER COMM. PRINTING
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		THUNDER BAY	332992	5362809	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	IND. ORGANIC CHEM.
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		THUNDER BAY	332992	5362809	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	IND. ORGANIC CHEM.
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		THUNDER BAY	332992	5362809	S	REGISTERABLE SOLID WASTE	OTHER POLYMERIC WASTES	IND. ORGANIC CHEM.
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		THUNDER BAY	332992	5362809	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. ORGANIC CHEM.
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		THUNDER BAY	332992	5362809	L	FOR MANIFEST, SPECIFIC GRAVITY	OTHER SPECIFIED ORGANICS	IND. ORGANIC CHEM.
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		THUNDER BAY	332992	5362809	L	CORROSIVE	OTHER SPECIFIED ORGANICS	IND. ORGANIC CHEM.
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		THUNDER BAY	332992	5362809	L	LIQUID INDUSTRIAL WASTE	OTHER SPECIFIED ORGANICS	IND. ORGANIC CHEM.
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		THUNDER BAY	332992	5362809	L	LIQUID INDUSTRIAL WASTE	OTHER POLYMERIC WASTES	IND. ORGANIC CHEM.
ON1483401	RAM-CETT ENTERPRISES	1660 ROSSLYN ROAD		THUNDER BAY	326913	5359179	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER VEH. REPAIR
ON1483400	RAM-CETT ENTERPRISES (OUT OF BUSINESS)32	992 ALLOY DRIVE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER VEH. REPAIR
ON1930700	RANKIN EQUIPMENT LTD.	655 MOUNTDALE AVE.		THUNDER BAY	329964	5360623	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTR./FOREST. MACH.
ON1930700	RANKIN EQUIPMENT LTD.	655 MOUNTDALE AVE.		THUNDER BAY	329964	5360623	L	IGNITABLE	PETROLEUM DISTILLATES	CONSTR./FOREST. MACH.
ON1930700	RANKIN EQUIPMENT LTD.	655 MOUNTDALE AVE.		THUNDER BAY	329964	5360623	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	CONSTR./FOREST. MACH.
ON0018302	REICHHOLD LIMITED (SEE & USE ON1542401)	1100 MONTREAL STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PLASTIC & SYN. RESIN
ON0018302	REICHHOLD LIMITED (SEE & USE ON1542401)	1100 MONTREAL STREET		THUNDER BAY			S	HAZARDOUS INDUSTRIAL WASTE	POLYMERIC RESINS	PLASTIC & SYN. RESIN
ON0018302	REICHHOLD LIMITED (SEE & USE ON1542401)	1100 MONTREAL STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	AROMATIC SOLVENTS	PLASTIC & SYN. RESIN
ON0299805	RENT-A-WRECK	434 MEMORIAL AVENUE		THUNDER BAY	334504	5365792	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON0299801	RENT-A-WRECK	522 MEMORIAL AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON0333701	RICHARDSON TERMINALS	181 NORTH WATER STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GRAIN ELEVATOR IND.
ON0333701	RICHARDSON TERMINALS	181 NORTH WATER STREET		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	GRAIN ELEVATOR IND.
ON0333701	RICHARDSON TERMINALS	181 NORTH WATER STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GRAIN ELEVATOR IND.
ON0333700	RICHARDSON TERMINALS LTD.	FOOT OF MCDOUGALL STREET		THUNDER BAY			L	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON0155316	RICOH CANADA INC.	1238 AMBER DRIVE		THUNDER BAY	332673	5364312	L	IGNITABLE	PETROLEUM DISTILLATES	ELECT. OFFICE, ETC.
ON1268901	RIVER LAKE TIMBER (1991) LIMITED	OPERATING UNIT #234 MAIN DOG RIVER ROAD	15 MILES NORTH OF HIGHWAY #17	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON1268900	RIVER LAKE TIMBER (1991) LTD.	636 SQUIRESTREET		THUNDER BAY	333694	5364989	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ON0481701	RUB A DUB DRYCLEANERS 33-113	GRANDVIEW MALL	640 RIVER STREET	THUNDER BAY	334837	5368578	S	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	SELF SERVE LAUND.
ON0481700	RUB A DUB DRYCLEANERS, COUNTY FAIR PLAZA	1020 DOWSON ROAD		THUNDER BAY	333431	5369023	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	SELF SERVE LAUND.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON1611800	RUGGEDAIR SYSTEMS LIMITED 33-943	710 NORAH CRESCENT		THUNDER BAY	333114	5362796	L	IGNITABLE	PETROLEUM DISTILLATES	SHEET METAL & DUCT.
ON1611800	RUGGEDAIR SYSTEMS LIMITED 33-943	710 NORAH CRESCENT		THUNDER BAY	333114	5362796	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	SHEET METAL & DUCT.
ON0447300	RUMBLE (OUT OF BUS) 33-098	P.O. BOX 815	815 NORAH CRESCENT	THUNDER BAY	332995	5362910	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON0177620	RYDER TRUCK RENTAL CANADA LTD.,	815 SIMPSON STREET		THUNDER BAY	334391	5362627	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON1225500	SALVATION ARMY, THE 36-601	545 CUMBERLAND ST. N.		THUNDER BAY	337823	5368731	L	CORROSIVE	ACID WASTE - HEAVY METALS	OTHER NON-INST. SERV.
ONF029900	SARGENT & SON FUNERAL HOME	21 NORTH COURT STREET		THUNDER BAY			L	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES
ONF029900	SARGENT & SON FUNERAL HOME	21 NORTH COURT STREET		THUNDER BAY			S	PATHOLOGICAL	PATHOLOGICAL WASTES	FUNERAL HOMES
ONF029900	SARGENT & SON FUNERAL HOME	21 NORTH COURT STREET		THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	PATHOLOGICAL WASTES	FUNERAL HOMES
ON0396404	SASKATCHEWAN WHEAT POOL	TERMINAL 15 DARREL AVENUE		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	GRAIN ELEVATOR IND.
ON0396404	SASKATCHEWAN WHEAT POOL	TERMINAL 15 DARREL AVENUE		THUNDER BAY			L	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON0396404	SASKATCHEWAN WHEAT POOL	TERMINAL 15 DARREL AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GRAIN ELEVATOR IND.
ON0396402	SASKATCHEWAN WHEAT POOL	TERMINAL 7, MAUREEN STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GRAIN ELEVATOR IND.
ON0396402	SASKATCHEWAN WHEAT POOL	TERMINAL 7, MAUREEN STREET		THUNDER BAY			L	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON0396402	SASKATCHEWAN WHEAT POOL	TERMINAL 7, MAUREEN STREET		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	GRAIN ELEVATOR IND.
ON0396400	SASKATCHEWAN WHEAT POOL 34-065	TERMINAL 4	MCDOUGALL STREET/SHIPYARD ROAD	THUNDER BAY			L	IGNITABLE	LIGHT FUELS	GRAIN ELEVATOR IND.
ON0396400	SASKATCHEWAN WHEAT POOL 34-065	TERMINAL 4	MCDOUGALL STREET/SHIPYARD ROAD	THUNDER BAY			L	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON0396400	SASKATCHEWAN WHEAT POOL 34-065	TERMINAL 4	MCDOUGALL STREET/SHIPYARD ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GRAIN ELEVATOR IND.
ON0396401	SASKATCHEWAN WHEAT POOL 34-066	TERMINAL #6	MANITOU STREET/SOUTH WATER STREET	THUNDER BAY			L	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON0396401	SASKATCHEWAN WHEAT POOL 34-066	TERMINAL #6	MANITOU STREET/SOUTH WATER STREET	THUNDER BAY			L	CORROSIVE	OIL SKIMMINGS & SLUDGES	GRAIN ELEVATOR IND.
ON0396401	SASKATCHEWAN WHEAT POOL 34-066	TERMINAL #6	MANITOU STREET/SOUTH WATER STREET	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GRAIN ELEVATOR IND.
ON0396403	SASKATCHEWAN WHEAT POOL 34-068	C/O 34 NORTH CUMBERLAND STREET	TERMINAL 8, DUNCAN STREET	THUNDER BAY			L	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON2432900	SCOTT WALTERHOUSE	107 FIRST SIDE ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER TRUCK./TRANS.
ON0215640	SEARS (OUT OF BUSINESS)	830 ATHABASCA STREET		THUNDER BAY	334561	5362679	L	IGNITABLE	PETROLEUM DISTILLATES	DEPARTMENT STORES
ON0215640	SEARS (OUT OF BUSINESS)	830 ATHABASCA STREET		THUNDER BAY	334561	5362679	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	DEPARTMENT STORES
ON0215662	SEARS CANADA INC.	880 FORT WILLIAM ROAD	GAS SHOP	THUNDER BAY	333943	5363628	L	IGNITABLE	PETROLEUM DISTILLATES	DEPARTMENT STORES
ON0215662	SEARS CANADA INC.	880 FORT WILLIAM ROAD	GAS SHOP	THUNDER BAY	333943	5363628	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	DEPARTMENT STORES
ON1018900	SERVICES & MATERIALS CO. CANADA 35-304	BOX 2956	100 MAIN ST., UNIT #22	THUNDER BAY	335665	5364013	L	IGNITABLE	PETROLEUM DISTILLATES	OTHER PLASTIC PROD.
ON0355802	SHAW BAKING COMPANY	240 SOUTH ALGOMA STREET		THUNDER BAY	334892	5366472	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	BREAD & OTHER PROD.
ON0355800	SHAW BAKING COMPANY (OUT OF BUSINESS)	402 NORTH MAY STREET		THUNDER BAY	333796	5362126	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	BREAD & OTHER PROD.
ON0371800	SHEARMET RECYCLING (OUT OF BUSINESS)	FERS ET METAUX RECYCLES LTEE.	700 MONTREAL STREET	THUNDER BAY	330222	5358556	S	PCB WASTE	PCB'S	COMB. METAL PROD.
ON1927300	SHELTER HOUSE	80 SIMPSON STREET		THUNDER BAY	333942	5361351	S	PATHOLOGICAL	PATHOLOGICAL WASTES	OTHER HEALTH/SOC. ASSOC.
ON0158410	SHERIDAN EQUIPMENT	STRONG EQUIPMENT CORPORATION, A DIV. OF	655 MOUNTDALE AVENUE	THUNDER BAY	329964	5360623	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	CONSTR./FOREST. MACH.
ON0158410	SHERIDAN EQUIPMENT	STRONG EQUIPMENT CORPORATION, A DIV. OF	655 MOUNTDALE AVENUE	THUNDER BAY	329964	5360623	L	IGNITABLE	PETROLEUM DISTILLATES	CONSTR./FOREST. MACH.
ON0158410	SHERIDAN EQUIPMENT	STRONG EQUIPMENT CORPORATION, A DIV. OF	655 MOUNTDALE AVENUE	THUNDER BAY	329964	5360623	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTR./FOREST. MACH.
ON0158410	SHERIDAN EQUIPMENT	STRONG EQUIPMENT CORPORATION, A DIV. OF	655 MOUNTDALE AVENUE	THUNDER BAY	329964	5360623	L	LEACHATE TOXIC	NEUTRALIZED WASTES - OTHER METALS	CONSTR./FOREST. MACH.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0158403	SHERIDAN EQUIPMENT (OUT OF BUSINESS)	STRONG EQUIPMENT CORPORATION, A DIV. OF	2100 MOUNTDALE AVENUE	THUNDER BAY			L	LEACHATE TOXIC	NEUTRALIZED WASTES - OTHER METALS	CONSTR./FOREST. MACH.
ON0158403	SHERIDAN EQUIPMENT (OUT OF BUSINESS)	STRONG EQUIPMENT CORPORATION, A DIV. OF	2100 MOUNTDALE AVENUE	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	CONSTR./FOREST. MACH.
ON0158403	SHERIDAN EQUIPMENT (OUT OF BUSINESS)	STRONG EQUIPMENT CORPORATION, A DIV. OF	2100 MOUNTDALE AVENUE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	CONSTR./FOREST. MACH.
ON0158403	SHERIDAN EQUIPMENT (OUT OF BUSINESS)	STRONG EQUIPMENT CORPORATION, A DIV. OF	2100 MOUNTDALE AVENUE	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	CONSTR./FOREST. MACH.
ON1740100	SHUNIAH FOREST PRODUCTS LIMITED	1450 WEST WALSH STREET		THUNDER BAY	329536	5360247	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON1740101	SHUNIAH FOREST PRODUCTS LIMITED	MINING LOCATION 8, PARTS 3&4		SHUNIAH TWP.			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0321500	SHUNIAH, TOWNSHIP OF	PTN OF MINING LOCATION 12 HERRICK'S	SURVEY, MACGREGOR TOWNSHIP, R. R. #13	SHUNIAH			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0850201	SPENCE CLINIC, THE	1265 ARTHUR STREET, 5TH FLOOR		THUNDER BAY	332980	5361117	L	PATHOLOGICAL	EXPLOSIVE MANUFACTURING WASTES	MEDICAL LABORATORIES
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	OTHER INORGANIC ACID WASTES	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	AROMATIC SOLVENTS	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	ALIPHATIC SOLVENTS	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	AMINES	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			S	PATHOLOGICAL	PATHOLOGICAL WASTES	GENERAL HOSPITALS
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	HALOGENATED SOLVENTS	GENERAL HOSPITALS
ON0950200	STAN BATES CONST. LTD.	1177 ROLAND ST.		THUNDER BAY	333017	5363348	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	HIGHWAYS, STR., ETC.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	INERT INORGANIC WASTES	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	INORGANIC LABORATORY CHEMICALS	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			S	LEACHATE TOXIC	BRINES, CHLOR-ALKALI WASTES	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			S	REGISTERABLE SOLID WASTE	BRINES, CHLOR-ALKALI WASTES	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			S	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	IND. INORGANIC CHEM.
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. INORGANIC CHEM.
ON1736800	STURGEON TIMBER LIMITED	LOT 2, CONCESSION 3	R.R. #1	TWP. OF DORION			L	HAZARDOUS INDUSTRIAL WASTE	PETROLEUM DISTILLATES	LOGGING INDUSTRY
ON1736800	STURGEON TIMBER LIMITED	LOT 2, CONCESSION 3	R.R. #1	TWP. OF DORION			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON2232000	SUMMIT PIPELINE SER(OUT OF BUSINESS)	1280 ROSSLYN ROAD		THUNDER BAY	328452	5358987	L	LIQUID INDUSTRIAL WASTE	POLYMERIC RESINS	GAS & OIL PIPELINES
ON2232000	SUMMIT PIPELINE SER(OUT OF BUSINESS)	1280 ROSSLYN ROAD		THUNDER BAY	328452	5358987	L	IGNITABLE	PETROLEUM DISTILLATES	GAS & OIL PIPELINES

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON2232001	SUMMIT PIPELINE SERVICES LTD.	2240 25TH SIDEROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GAS & OIL PIPELINES
ON2232001	SUMMIT PIPELINE SERVICES LTD.	2240 25TH SIDEROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	POLYMERIC RESINS	GAS & OIL PIPELINES
ON2232001	SUMMIT PIPELINE SERVICES LTD.	2240 25TH SIDEROAD		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	GAS & OIL PIPELINES
ON0036105	SUNTRACT RENTALS	399 MEMORIAL AVENUE		THUNDER BAY	334630	5365891	L	IGNITABLE	PETROLEUM DISTILLATES	IND. MACH. RENTAL
ON0036105	SUNTRACT RENTALS	399 MEMORIAL AVENUE		THUNDER BAY	334630	5365891	L	IGNITABLE	LIGHT FUELS	IND. MACH. RENTAL
ON0036105	SUNTRACT RENTALS	399 MEMORIAL AVENUE		THUNDER BAY	334630	5365891	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	IND. MACH. RENTAL
ON2034900	SUPERIOR 3-R INC.	138 ADA AVE.		THUNDER BAY	329497	5371710	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER SERVICES
ON0479500	SUPERIOR CARTAGE (LAKEHEAD) LTD.		541 HARDISTY STREET	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GEN. FREIGHT TRUCK.
ON2224000	SUPERIOR DRILLING & BLASTING LTD.	RUBIN DRIVE, LOT 105		OLIVER TWP.			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	EXCAVAT. & GRADING
ON0459000	SUPREME CLEANERS LAKEHEAD LTD. 36-133		425 S. SYNDICATE AVENUE	THUNDER BAY	333534	5360802	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POWER LAUND./CLEANERS
ON0459001	SUPREME CLEANERS LKHD. LTD.	434 NORTH EDWARD STREET		THUNDER BAY	331383	5362505	S	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	POWER LAUND./CLEANERS
ON2133000	T.L.C. POWER SYSTEMS/89742 3 ONTARIO INC.	1473 ROSSLYN ROAD		THUNDER BAY	327712	5359265	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECTRIAL WORK
ON1222900	TAIGA TRUCKING ONTARIO 1980 INC.	2689 FIRE LOCATION	LOT 4, CONC. 2, ARTHUR STREET WEST	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	FOREST PROD. TRUCK.
ON0041500	TEAM EFFORT SERVICES LTD.	399 MOONEY STREET	P.O.BOX 3416	THUNDER BAY	334311	5364048	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER VEH. REPAIR
ON0962600	TECHNICAL COOL INC.	219 GORE STREET WEST		THUNDER BAY	330930	5359313	L	CORROSIVE	ALKALINE WASTES - HEAVY METALS	OTHER VEH. SERVICES
ON0005216	TEXACO (SEE&USE ON1315149)	MCKELLAR ISLAND		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	PETROLEUM PROD., WH.
ON0005216	TEXACO (SEE&USE ON1315149)	MCKELLAR ISLAND		THUNDER BAY			L	IGNITABLE	OIL SKIMMINGS & SLUDGES	PETROLEUM PROD., WH.
ON0481403	THRIFTY (OUT OF BUS)	567 MEMORIAL AVENUE		THUNDER BAY	334317	5365298	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON0481404	THRIFTY CAR RENTAL	552 12TH AVENUE		THUNDER BAY	333633	5364361	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON0481400	THRIFTY CAR RENTAL	P.R. PARADIS ENT. LTD.	434 MEMORIAL AVENUE	THUNDER BAY	334504	5365792	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AUTO./TRUCK RENTAL
ON2395300	THUDER BAY HARBOUR COMMISSION	KEFFER TERMINAL	100 MAIN STREET	THUNDER BAY	335665	5364013	S	PCB WASTE	PCB'S	OTHER GEN. ADMIN.
ON1294300	THUNDER AIRLINES 02-341	#1 ROUND BOULEVARD	THUNDER BAY AIRPORT	THUNDER BAY	328975	5360279	L	IGNITABLE	LIGHT FUELS	NON-SCHED. A.T.-CHAR.
ON1294300	THUNDER AIRLINES 02-341	#1 ROUND BOULEVARD	THUNDER BAY AIRPORT	THUNDER BAY	328975	5360279	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	NON-SCHED. A.T.-CHAR.
ON1788503	THUNDER AIRLINES LIMITED	310 HECTOR DOUGALL WAY		THUNDER BAY	328387	5360107	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	NON-SCHED. A.T.-CHAR.
ON1788503	THUNDER AIRLINES LIMITED	310 HECTOR DOUGALL WAY		THUNDER BAY	328387	5360107	L	IGNITABLE	LIGHT FUELS	NON-SCHED. A.T.-CHAR.
ON0870000	THUNDER BAY AMBULANCE SERVICES LTD37-274		1118A ROLAND ST.	THUNDER BAY	332926	5363621	L	LIQUID INDUSTRIAL WASTE	INERT INORGANIC WASTES	OTHER TRANS. IND.
ON0922100	THUNDER BAY AUTO PARTS, DIV. OF	520 SQUIER STREET		THUNDER BAY	334072	5365218	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	TIRE, ETC. STORES
ON1612300	THUNDER BAY BLDNG.&REAL ESTATE LTD37-932	1947 JOHN ST. RD.	C/O 627 DAWSON STREET	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	NON-RES. BLDG. OPER.
ON1221804	THUNDER BAY CATHOLIC	ST. THOMAS AQUINAS SCHOOL	459 W. VICTORIA AVENUE	THUNDER BAY	330588	5361600	L	PATHOLOGICAL	PATHOLOGICAL WASTES	ELEMT./SECON. EDUC.
ON1221807	THUNDER BAY CATHOLIC	ST. VINCENT SCHOOL	150 W. REDWOOD AVENUE	THUNDER BAY	330888	5362488	S	PATHOLOGICAL	PATHOLOGICAL WASTES	ELEMT./SECON. EDUC.
ON1889900	THUNDER BAY COUNTRY CLUB LTD.	1055 OLIVER ROAD		THUNDER BAY	331846	5365166	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GOLF COURSES
ON0392910	THUNDER BAY FIRE DEPARTMENT	60 SOUTH WATER STREET	NORTH CENTRAL FIRE HALL	THUNDER BAY	335695	5366738	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FIREFIGHTING SERV.
ON0859300	THUNDER BAY FLYING CLUB 37-284	417 JOHN PATERSON DRIVE		THUNDER BAY	328622	5359924	L	IGNITABLE	LIGHT FUELS	NON-SCHED. A.T.-CHAR.
ON0859300	THUNDER BAY FLYING CLUB 37-284	417 JOHN PATERSON DRIVE		THUNDER BAY	328622	5359924	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	NON-SCHED. A.T.-CHAR.
ON0859300	THUNDER BAY FLYING CLUB 37-284	417 JOHN PATERSON DRIVE		THUNDER BAY	328622	5359924	L	IGNITABLE	PETROLEUM DISTILLATES	NON-SCHED. A.T.-CHAR.
ON0478700	THUNDER BAY HYDRAULICS LTD.	R.R. #4, SOUTH JAMES STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	MACHINE SHOP IND.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0171703	THUNDER BAY HYDRO	1000 WEST MARY STREETSUBSTATION	#7 SUBSTATION	THUNDER BAY	329909	5359879	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ELECT. POWER SYS.
ON0171705	THUNDER BAY HYDRO	111 NORTH HIGH STREET		THUNDER BAY	335043	5367712	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ELECT. POWER SYS.
ON0171707	THUNDER BAY HYDRO	187 WINDEMERE AVENUE	#21 SUBSTATION	THUNDER BAY	333829	5367293	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ELECT. POWER SYS.
ON0171701	THUNDER BAY HYDRO	229 NORTH VICKERS STREET	# 4 SUBSTATION	THUNDER BAY			L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ELECT. POWER SYS.
ON0171702	THUNDER BAY HYDRO	2605 EAST DONALD STREET	#5 SUBSTATION	THUNDER BAY	331683	5361339	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ELECT. POWER SYS.
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY	336543	5367670	L	CORROSIVE	ALKALINE WASTES - HEAVY METALS	ELECT. POWER SYS.
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY	336543	5367670	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ELECT. POWER SYS.
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY	336543	5367670	L	PCB WASTE	PCB'S	ELECT. POWER SYS.
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY	336543	5367670	L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY	336543	5367670	L	CORROSIVE	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY	336543	5367670	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECT. POWER SYS.
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY	336543	5367670	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	ELECT. POWER SYS.
ON0171704	THUNDER BAY HYDRO	426 BALSAM STREET	#18 SUBSTATION	THUNDER BAY	335450	5369913	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ELECT. POWER SYS.
ON0171706	THUNDER BAY HYDRO	493 JOHN STREET	#13 SUBSTATION	THUNDER BAY	334044	5366609	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	ELECT. POWER SYS.
ON2428300	THUNDER BAY INTERNATIONAL AIRPORT	100 PRINCESS STREET, #340		THUNDER BAY	328856	5360297	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	AIRPORT OPER. IND.
ON2428300	THUNDER BAY INTERNATIONAL AIRPORT	100 PRINCESS STREET, #340		THUNDER BAY	328856	5360297	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	AIRPORT OPER. IND.
ON2428300	THUNDER BAY INTERNATIONAL AIRPORT	100 PRINCESS STREET, #340		THUNDER BAY	328856	5360297	L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	AIRPORT OPER. IND.
ON2428300	THUNDER BAY INTERNATIONAL AIRPORT	100 PRINCESS STREET, #340		THUNDER BAY	328856	5360297	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	AIRPORT OPER. IND.
ON2428300	THUNDER BAY INTERNATIONAL AIRPORT	100 PRINCESS STREET, #340		THUNDER BAY	328856	5360297	S	PCB WASTE	PCB'S	AIRPORT OPER. IND.
ON2428300	THUNDER BAY INTERNATIONAL AIRPORT	100 PRINCESS STREET, #340		THUNDER BAY	328856	5360297	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	AIRPORT OPER. IND.
ON2428300	THUNDER BAY INTERNATIONAL AIRPORT	100 PRINCESS STREET, #340		THUNDER BAY	328856	5360297	L	LIQUID INDUSTRIAL WASTE	LIGHT FUELS	AIRPORT OPER. IND.
ON2428300	THUNDER BAY INTERNATIONAL AIRPORT	100 PRINCESS STREET, #340		THUNDER BAY	328856	5360297	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	AIRPORT OPER. IND.
ON2150100	THUNDER BAY MAGNETIC LTD.	1223 AMBER DRIVE		THUNDER BAY	332521	5364218	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PLASTIC & SYN. RESIN
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	LIQUID INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	IGNITABLE	LIGHT FUELS	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	IGNITABLE	PETROLEUM DISTILLATES	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	HAZARDOUS INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	PAPERBOARD INDUSTRY
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		THUNDER BAY	339927	5370905	L	CORROSIVE	ACID WASTE - HEAVY METALS	PAPERBOARD INDUSTRY
ON0535300	THUNDER BAY PHOTO FIRST INC. 37-170		640 RIVER STREET	THUNDER BAY	334837	5368578	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	CAMERA/PHOTO. SUPPLY
ON1937800	THUNDER BAY POLICE	1200 BALMORAL STREET		THUNDER BAY	332802	5364657	S	PATHOLOGICAL	PATHOLOGICAL WASTES	POLICE SERVICES
ON1937800	THUNDER BAY POLICE	1200 BALMORAL STREET		THUNDER BAY	332802	5364657	S	CORROSIVE	ALKALINE WASTES - HEAVY METALS	POLICE SERVICES
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GENERAL HOSPITALS
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	L	CORROSIVE	ALKALINE WASTES - OTHER METALS	GENERAL HOSPITALS
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	L	CORROSIVE	PAINT/PIGMENT/COATING RESIDUES	GENERAL HOSPITALS
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	GENERAL HOSPITALS

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GENERAL HOSPITALS
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	GENERAL HOSPITALS
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	GENERAL HOSPITALS
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	S	PATHOLOGICAL	PATHOLOGICAL WASTES	GENERAL HOSPITALS
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		THUNDER BAY	333398	5360997	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	GENERAL HOSPITALS
ON0330901	THUNDER BAY REGIONAL HOSPITAL	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	GENERAL HOSPITALS
ON0330901	THUNDER BAY REGIONAL HOSPITAL	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	S	PATHOLOGICAL	PATHOLOGICAL WASTES	GENERAL HOSPITALS
ON0330901	THUNDER BAY REGIONAL HOSPITAL	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	GENERAL HOSPITALS
ON0330901	THUNDER BAY REGIONAL HOSPITAL	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	GENERAL HOSPITALS
ON0330901	THUNDER BAY REGIONAL HOSPITAL	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	L	LIQUID INDUSTRIAL WASTE	HEAVY FUELS	GENERAL HOSPITALS
ON0330901	THUNDER BAY REGIONAL HOSPITAL	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	S	PCB WASTE	PCB'S	GENERAL HOSPITALS
ON0346700	THUNDER BAY TERMINALS	PART 8, REG. PLAN 55R-2639	MCKELLAR ISLAND	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER STOR./WARE.
ON0346700	THUNDER BAY TERMINALS	PART 8, REG. PLAN 55R-2639	MCKELLAR ISLAND	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER STOR./WARE.
ON2002701	THUNDER BAY TESTING & ENGINEERING LTD.	711 HAROLD CRESCENT		THUNDER BAY	333159	5362753	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	OTHER SCI./TECH. OF.
ON2002700	THUNDER BAY TESTING(OUT OF BUSINESS)	807 HAROLD CRESCENT		THUNDER BAY	333209	5362910	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	OTHER SCI./TECH. OF.
ON0807100	THUNDER BAY TRUCK CENTRE 37-602	1145 COMMERCE STREET		THUNDER BAY	329803	5360311	L	LIQUID INDUSTRIAL WASTE	INERT INORGANIC WASTES	GARAGES(GEN. REPAIR)
ON0807100	THUNDER BAY TRUCK CENTRE 37-602	1145 COMMERCE STREET		THUNDER BAY	329803	5360311	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GARAGES(GEN. REPAIR)
ON2154100	THUNDER BAY YACHT CLUB	1851 108TH AVENUE		THUNDER BAY	334841	5359082	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER W. TRANS. IND.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	IGNITABLE	PETROLEUM DISTILLATES	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED PESTICIDES	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	IGNITABLE	LIGHT FUELS	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	ACUTELY HAZARDOUS WASTE CHEM.	PHARMACEUTICALS	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	ACUTELY HAZARDOUS WASTE CHEM.	NON-HALOGENATED PESTICIDES	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			G	IGNITABLE	WASTE COMPRESSED GASES	TRANSPORTATION ADMIN.
ON0392909	THUNDER BAY, CITY OF	625 CUMBERLAND STREET NORTH	TRAFFIC CONTROL & STREET LIGHTING YARD	THUNDERBAY			L	HAZARDOUS WASTE CHEMICAL	HALOGENATED SOLVENTS	TRANSPORTATION ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	G	IGNITABLE	WASTE COMPRESSED GASES	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED PESTICIDES	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	LEACHATE TOXIC	TRANSFER STATION OILS WASTES	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	LIQUID INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	IGNITABLE	PAINT/PIGMENT/COATING RESIDUES	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	IGNITABLE	INORGANIC LABORATORY CHEMICALS	ENVIRON. ADMIN.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	CORROSIVE	INORGANIC LABORATORY CHEMICALS	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	IGNITABLE	PETROLEUM DISTILLATES	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	IGNITABLE	LIGHT FUELS	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	IGNITABLE	POLYMERIC RESINS	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED SOLVENTS	ENVIRON. ADMIN.
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	THUNDER BAY	323855	5367145	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	ENVIRON. ADMIN.
ON0392905	THUNDER BAY, CITY OF	ATLANTIC AVENUE WPCP		THUNDER BAY			S	PCB WASTE	PCB'S	WATER SYSTEMS IND.
ON0392905	THUNDER BAY, CITY OF	ATLANTIC AVENUE WPCP		THUNDER BAY			L	IGNITABLE	WASTE OILS & LUBRICANTS	WATER SYSTEMS IND.
ON0392906	THUNDER BAY, CITY OF	FORT WILLIAM GARDENS	901 MILES STREET	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	REC./CULTURE ADMIN.
ON0392907	THUNDER BAY, CITY OF	R.R. #3, BARE POINT OFF LAKESHORE DR.	BARE POINT WATER TREATMENT PLANT	THUNDER BAY			L	CORROSIVE	OIL SKIMMINGS & SLUDGES	WATER SYSTEMS IND.
ON0392907	THUNDER BAY, CITY OF	R.R. #3, BARE POINT OFF LAKESHORE DR.	BARE POINT WATER TREATMENT PLANT	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	WATER SYSTEMS IND.
ON0392908	THUNDER BAY, CITY OF	TELECOMMUNICATIONS DEPARTMENT	1050 LITHIUM DRIVE	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER TELECOMMUN.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED PESTICIDES	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED SOLVENTS	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	WASTE OILS & LUBRICANTS	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	LEACHATE TOXIC	TRANSFER STATION OILS WASTES	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	ACUTELY HAZARDOUS WASTE CHEM.	NON-HALOGENATED PESTICIDES	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			S	ACUTELY HAZARDOUS WASTE CHEM.	WASTE COMPRESSED GASES	OTHER UTILITY IND.
ON0392901	THUNDER BAY, CORP. OF THE CITY OF	410 MOUNTDALE AVENUE		THUNDER BAY			L	IGNITABLE	LIGHT FUELS	OTHER UTILITY IND.
ON0392900	THUNDER BAY, CORP. OF THE CITY OF	MAINTENANCE DIVISION	570 FORT WILLIAM ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	TRANSPORTATION ADMIN.
ON0392902	THUNDER BAY, CORP. OF THE CITY OF	MAINTENANCE DIVISION	155 FRONT STREET	THUNDER BAY	336829	5367887	L	IGNITABLE	PETROLEUM DISTILLATES	TRANSPORTATION ADMIN.
ON0392900	THUNDER BAY, CORP. OF THE CITY OF	MAINTENANCE DIVISION	570 FORT WILLIAM ROAD	THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	TRANSPORTATION ADMIN.
ON0392900	THUNDER BAY, CORP. OF THE CITY OF	MAINTENANCE DIVISION	570 FORT WILLIAM ROAD	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0392902	THUNDER BAY, CORP. OF THE CITY OF	MAINTENANCE DIVISION	155 FRONT STREET	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0392902	THUNDER BAY, CORP. OF THE CITY OF	MAINTENANCE DIVISION	155 FRONT STREET	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	TRANSPORTATION ADMIN.
ON0392903	THUNDER BAY, CORP. OF THE CITY OF 37-074	MANTENANCE DIVISION	1500 WALSH ST.	THUNDER BAY	332874	5360340	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	TRANSPORTATION ADMIN.
ON0392911	THUNDER BAY, CORP. OF THE CITY OF 38-694	500 DONALD STREET EAST		THUNDER BAY			L	PCB WASTE	PCB'S	EXEC./LEGIS. ADMIN.
ON0458600	THUNDERPINE LEASING INC.	COOPER ROAD, LOT 7, CONCESSION 2		PAIPOONGE TWP.			L	IGNITABLE	PETROLEUM DISTILLATES	FOREST PROD. TRUCK.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0458600	THUNDERPINE LEASING INC.	COOPER ROAD, LOT 7, CONCESSION 2		PAIPOONGE TWP.			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	FOREST PROD. TRUCK.
ON0508103	TIMES-NEWS/CHRONICLE-JOURNAL	75 CUMBERLAND STREET SOUTH		THUNDER BAY	335657	5366688	L	IGNITABLE	AROMATIC SOLVENTS	NEWSPAPER, ETC. IND.
ON0508103	TIMES-NEWS/CHRONICLE-JOURNAL	75 CUMBERLAND STREET SOUTH		THUNDER BAY	335657	5366688	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	NEWSPAPER, ETC. IND.
ON0508103	TIMES-NEWS/CHRONICLE-JOURNAL	75 CUMBERLAND STREET SOUTH		THUNDER BAY	335657	5366688	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	NEWSPAPER, ETC. IND.
ON0508103	TIMES-NEWS/CHRONICLE-JOURNAL	75 CUMBERLAND STREET SOUTH		THUNDER BAY	335657	5366688	L	LIQUID INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	NEWSPAPER, ETC. IND.
ON0998000	TOM JONES CONSTRUCTION	560 SQUIRE PLACE		THUNDER BAY	333911	5365244	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	MANU. & IND. BLDG.
ON1731400	TOWANDA TIMBER (OUT OF BUSINESS)	ROSSLYN BRICK YARD IN ROSSLYN VILLAGE	PART OF LOT #11&12 CONC. 1, N.OF RIVER	PAIGOONGE			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	LOGGING INDUSTRY
ON0455000	TOWLAND-HEWITSON CONSTRUCTION LTD.	1340 OLIVER ROAD		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	HIGHWAYS, STR., ETC.
ON0455000	TOWLAND-HEWITSON CONSTRUCTION LTD.	1340 OLIVER ROAD		THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	HIGHWAYS, STR., ETC.
ON0455000	TOWLAND-HEWITSON CONSTRUCTION LTD.	1340 OLIVER ROAD		THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	HIGHWAYS, STR., ETC.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	WASTE OILS & LUBRICANTS	GAS PIPELINE TRANS.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GAS PIPELINE TRANS.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GAS PIPELINE TRANS.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			S	PCB WASTE	PCB'S	GAS PIPELINE TRANS.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GAS PIPELINE TRANS.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			L	IGNITABLE	ALIPHATIC SOLVENTS	GAS PIPELINE TRANS.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			L	FOR MANIFEST, SPECIFIC GRAVITY	ALIPHATIC SOLVENTS	GAS PIPELINE TRANS.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GAS PIPELINE TRANS.
ON0174636	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #69-EAGLEHEAD	NEAR STARNES LAKE ON TERTIARY HWY. 527	DIST. OF THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	GAS PIPELINE TRANS.
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GAS PIPELINE TRANS.
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GAS PIPELINE TRANS.
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GAS PIPELINE TRANS.
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			S	PCB WASTE	PCB'S	GAS PIPELINE TRANS.
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GAS PIPELINE TRANS.
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			L	FOR MANIFEST, SPECIFIC GRAVITY	WASTE OILS & LUBRICANTS	GAS PIPELINE TRANS.
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			L	IGNITABLE	ALIPHATIC SOLVENTS	GAS PIPELINE TRANS.
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			L	IGNITABLE	PETROLEUM DISTILLATES	GAS PIPELINE TRANS.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0174635	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #70-HURKETT	LOT 13, CONCESSION 1	TOWNSHIP OF DORION			L	FOR MANIFEST, SPECIFIC GRAVITY	ALIPHATIC SOLVENTS	GAS PIPELINE TRANS.
ON0174646	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #84, KLOTZ LAKE	PARCEL 13971TBF, UNSURVEYED TERRITORY	DISTRICT OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GAS PIPELINE TRANS.
ON0174646	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #84, KLOTZ LAKE	PARCEL 13971TBF, UNSURVEYED TERRITORY	DISTRICT OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	GAS PIPELINE TRANS.
ON0174646	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #84, KLOTZ LAKE	PARCEL 13971TBF, UNSURVEYED TERRITORY	DISTRICT OF THUNDER BAY			L	IGNITABLE	PETROLEUM DISTILLATES	GAS PIPELINE TRANS.
ON0174646	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #84, KLOTZ LAKE	PARCEL 13971TBF, UNSURVEYED TERRITORY	DISTRICT OF THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GAS PIPELINE TRANS.
ON0174646	TRANSCANADA (SEE & USE ONR000206)	TCPL COMPRESSOR STATION #84, KLOTZ LAKE	PARCEL 13971TBF, UNSURVEYED TERRITORY	DISTRICT OF THUNDER BAY			L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GAS PIPELINE TRANS.
ON0174627	TRANSCANADA (SEE & USE ONR000206)	TCPL HELICOPTER HANGAR	520 ORVILLE WIEBEN CRES, AIRPORT	THUNDER BAY	328599	5359771	L	IGNITABLE	LIGHT FUELS	GAS PIPELINE TRANS.
ON0174627	TRANSCANADA (SEE & USE ONR000206)	TCPL HELICOPTER HANGAR	520 ORVILLE WIEBEN CRES, AIRPORT	THUNDER BAY	328599	5359771	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GAS PIPELINE TRANS.
ON0174627	TRANSCANADA (SEE & USE ONR000206)	TCPL HELICOPTER HANGAR	520 ORVILLE WIEBEN CRES, AIRPORT	THUNDER BAY	328599	5359771	L	IGNITABLE	PETROLEUM DISTILLATES	GAS PIPELINE TRANS.
ON0175119	TRANSPORT CANADA(SEE & USE ON2428300)	THUNDER BAY AIRPORT - MAINTENANCE GARAGE	340 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER GEN. ADMIN.
ON0175119	TRANSPORT CANADA(SEE & USE ON2428300)	THUNDER BAY AIRPORT - MAINTENANCE GARAGE	340 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	HAZARDOUS INDUSTRIAL WASTE	AROMATIC SOLVENTS	OTHER GEN. ADMIN.
ON0175119	TRANSPORT CANADA(SEE & USE ON2428300)	THUNDER BAY AIRPORT - MAINTENANCE GARAGE	340 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	OTHER GEN. ADMIN.
ON0175119	TRANSPORT CANADA(SEE & USE ON2428300)	THUNDER BAY AIRPORT - MAINTENANCE GARAGE	340 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	LIQUID INDUSTRIAL WASTE	LIGHT FUELS	OTHER GEN. ADMIN.
ON0175119	TRANSPORT CANADA(SEE & USE ON2428300)	THUNDER BAY AIRPORT - MAINTENANCE GARAGE	340 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	S	PCB WASTE	PCB'S	OTHER GEN. ADMIN.
ON0175119	TRANSPORT CANADA(SEE & USE ON2428300)	THUNDER BAY AIRPORT - MAINTENANCE GARAGE	340 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	FOR MANIFEST, SPECIFIC GRAVITY	OIL SKIMMINGS & SLUDGES	OTHER GEN. ADMIN.
ON0175119	TRANSPORT CANADA(SEE & USE ON2428300)	THUNDER BAY AIRPORT - MAINTENANCE GARAGE	340 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER GEN. ADMIN.
ON0175119	TRANSPORT CANADA(SEE & USE ON2428300)	THUNDER BAY AIRPORT - MAINTENANCE GARAGE	340 HECTOR DOUGALL WAY	THUNDER BAY	328387	5360107	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	OTHER GEN. ADMIN.
ON0176204	TRIMAC TRANSPORTATION SERVICES INC.	1591 ROSSLYN ROAD		THUNDER BAY	327265	5359277	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	BULK LIQ. TRUCKING
ON0176204	TRIMAC TRANSPORTATION SERVICES INC.	1591 ROSSLYN ROAD		THUNDER BAY	327265	5359277	L	IGNITABLE	PETROLEUM DISTILLATES	BULK LIQ. TRUCKING
ON0176204	TRIMAC TRANSPORTATION SERVICES INC.	1591 ROSSLYN ROAD		THUNDER BAY	327265	5359277	L	CORROSIVE	ACID WASTE - HEAVY METALS	BULK LIQ. TRUCKING
ON0827000	TRIPLE S TRANSPORTATION LTD. 38-262	LOT 1 CONC 2 CONMEE TWP	C/O R.R. #1	KAKABEKA FALLS			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	SCHOOL BUS OPER.
ON0436603	TROTTIER BUS LINES	677 LAKESHORE DRIVE		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	SCHOOL BUS OPER.
ON1019605	TROW CONSULTING ENGINEERS LTD.	807 HAROLD CRESCENT		THUNDER BAY	333209	5362910	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	OTHER CONST. SERVICES
ON0003811	UNION CARBIDE CANADA LIMITED	PO BOX 443/STATION F	(820 MONTREAL STREET), LINDE PLANT	THUNDER BAY	330092	5358475	L	CORROSIVE	ALKALINE WASTES - HEAVY METALS	OTHER CHEM. PROD.
ON0003811	UNION CARBIDE CANADA LIMITED	PO BOX 443/STATION F	(820 MONTREAL STREET), LINDE PLANT	THUNDER BAY	330092	5358475	L	HAZARDOUS INDUSTRIAL WASTE	HALOGENATED SOLVENTS	OTHER CHEM. PROD.
ON0003811	UNION CARBIDE CANADA LIMITED	PO BOX 443/STATION F	(820 MONTREAL STREET), LINDE PLANT	THUNDER BAY	330092	5358475	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	OTHER CHEM. PROD.
ON0003811	UNION CARBIDE CANADA LIMITED	PO BOX 443/STATION F	(820 MONTREAL STREET), LINDE PLANT	THUNDER BAY	330092	5358475	L	LIQUID INDUSTRIAL WASTE	OIL SKIMMINGS & SLUDGES	OTHER CHEM. PROD.
ON0003811	UNION CARBIDE CANADA LIMITED	PO BOX 443/STATION F	(820 MONTREAL STREET), LINDE PLANT	THUNDER BAY	330092	5358475	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER CHEM. PROD.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0003811	UNION CARBIDE CANADA LIMITED	PO BOX 443/STATION F	(820 MONTREAL STREET), LINDE PLANT	THUNDER BAY	330092	5358475	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	OTHER CHEM. PROD.
ON0003811	UNION CARBIDE CANADA LIMITED	PO BOX 443/STATION F	(820 MONTREAL STREET), LINDE PLANT	THUNDER BAY	330092	5358475	L	IGNITABLE	PETROLEUM DISTILLATES	OTHER CHEM. PROD.
ON0178276	UNION GAS LIMITED	1230 CARRICK STREET		THUNDER BAY	333353	5363219	S	CORROSIVE	ALKALINE WASTES - HEAVY METALS	GAS DISTIRB. SYS.
ON0178276	UNION GAS LIMITED	1230 CARRICK STREET		THUNDER BAY	333353	5363219	L	HAZARDOUS WASTE CHEMICAL	INORGANIC LABORATORY CHEMICALS	GAS DISTIRB. SYS.
ON0178276	UNION GAS LIMITED	1230 CARRICK STREET		THUNDER BAY	333353	5363219	S	REGISTERABLE SOLID WASTE	INERT INORGANIC WASTES	GAS DISTIRB. SYS.
ON0178276	UNION GAS LIMITED	1230 CARRICK STREET		THUNDER BAY	333353	5363219	L	HAZARDOUS WASTE CHEMICAL	HALOGENATED SOLVENTS	GAS DISTIRB. SYS.
ON0178276	UNION GAS LIMITED	1230 CARRICK STREET		THUNDER BAY	333353	5363219	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GAS DISTIRB. SYS.
ON0178276	UNION GAS LIMITED	1230 CARRICK STREET		THUNDER BAY	333353	5363219	L	LIQUID INDUSTRIAL WASTE	EMULSIFIED OILS	GAS DISTIRB. SYS.
ON0178279	UNION GAS LIMITED	PART OF LOT 7, CONCESSION 3		GORHAM TOWNSHIP			S	IGNITABLE	ORGANIC LABORATORY CHEMICALS	GAS DISTIRB. SYS.
ON0178279	UNION GAS LIMITED	PART OF LOT 7, CONCESSION 3		GORHAM TOWNSHIP			L	LIQUID INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	GAS DISTIRB. SYS.
ON0178277	UNION GAS LIMITED	PART OF MINING LOCATION 23 A		THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	GAS DISTIRB. SYS.
ON0418800	UNITED (OUT OF BUS) 39-064	DIV OF COMMERCIAL PETRO & HYDRAULIC SER	842 NORTH VICKERS STREET	THUNDER BAY	333410	5363018	L	IGNITABLE	LIGHT FUELS	GAS, OIL STRUCTURES
ON0482401	UNITED GRAIN GROWERS LTD. 39-465	THUNDER BAY TERMINAL M		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	GRAIN ELEVATOR IND.
ON0418801	UNITED REPAIR SERVICE	910 COMMERCE STREET		THUNDER BAY	329996	5360199	L	IGNITABLE	LIGHT FUELS	GAS, OIL STRUCTURES
ON1073600	VALLEY CAMP INC. 40-206	THUNDER BAY MARINE TERMINAL	C/O P.O. BOX 190 MISSION DOCK	THUNDER BAY			S	PCB WASTE	PCB'S	MARINE CARGO HAND.
ON1073600	VALLEY CAMP INC. 40-206	THUNDER BAY MARINE TERMINAL	C/O P.O. BOX 190 MISSION DOCK	THUNDER BAY			L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	MARINE CARGO HAND.
ON1073600	VALLEY CAMP INC. 40-206	THUNDER BAY MARINE TERMINAL	C/O P.O. BOX 190 MISSION DOCK	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	MARINE CARGO HAND.
ON0869400	VIKING HELICOPTERS LTD. 40-137		THUNDER BAY INTERNATIONAL AIRPORT	THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	NON-SCHED. A.T.-CHAR.
ON0472500	VILJO (SEE & USE ON1643000) 40-053		1199 RUSSELL STREET	THUNDER BAY			L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	CONC. POURING & FIN.
ON1643000	VILJO PYHTILA SAND & GRAVEL INC. 40-344	1199 RUSSELL STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER VEH. REPAIR
ON0875400	VIVID PHOTOS 40-138		432-B N. SYNDICATE AVE.	THUNDER BAY	333598	5362238	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	PHOTOGRAPHERS
ON1447801	VOLUME TANK TRANSPORT INC.	2090 MOUNTDALE AVENUE		THUNDER BAY	330063	5358411	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	BULK LIQ. TRUCKING
ON0296600	VULCAN MACHINERY & EQUIPMENT LIMITED	915 MEMORIAL AVENUE		THUNDER BAY	333897	5364297	L	LEACHATE TOXIC	WASTE OILS & LUBRICANTS	CONSTRTUCTION EQUIP.
ON0296600	VULCAN MACHINERY & EQUIPMENT LIMITED	915 MEMORIAL AVENUE		THUNDER BAY	333897	5364297	L	IGNITABLE	PETROLEUM DISTILLATES	CONSTRTUCTION EQUIP.
ON0930700	W.J. CONNELL	1721 OLIVER ROAD		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	BULK DRY TRUCKING
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	G	IGNITABLE	WASTE COMPRESSED GASES	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	S	ACUTELY HAZARDOUS WASTE CHEM.	NON-HALOGENATED PESTICIDES	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	ACUTELY HAZARDOUS WASTE CHEM.	HALOGENATED PESTICIDES	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	ACUTELY HAZARDOUS WASTE CHEM.	ORGANIC LABORATORY CHEMICALS	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	IGNITABLE	PETROLEUM DISTILLATES	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	ACUTELY HAZARDOUS WASTE CHEM.	INORGANIC LABORATORY CHEMICALS	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	CORROSIVE	INORGANIC LABORATORY CHEMICALS	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	HAZARDOUS WASTE CHEMICAL	PAINT/PIGMENT/COATING RESIDUES	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	LIQUID INDUSTRIAL WASTE	PAINT/PIGMENT/COATING RESIDUES	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	IGNITABLE	PAINT/PIGMENT/COATING RESIDUES	DEPARTMENT STORES
ON1881521	WAL-MART CANADA INC.	777 MEMORIAL AVENUE		THUNDER BAY	334007	5364623	L	IGNITABLE	WASTE OILS & LUBRICANTS	DEPARTMENT STORES
ON0956901	WASAYA AIRWAYS LTD.	1485 ROSSLYN ROAD		THUNDER BAY	327653	5359266	L	HAZARDOUS INDUSTRIAL WASTE	ALIPHATIC SOLVENTS	NON-SCHED. A.T.-CHAR.
ON0956901	WASAYA AIRWAYS LTD.	1485 ROSSLYN ROAD		THUNDER BAY	327653	5359266	L	IGNITABLE	PETROLEUM DISTILLATES	NON-SCHED. A.T.-CHAR.
ON0956901	WASAYA AIRWAYS LTD.	1485 ROSSLYN ROAD		THUNDER BAY	327653	5359266	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	NON-SCHED. A.T.-CHAR.

Table H-6
Thunder Bay - Waste Generators

GEN_NO	GEN_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	PHY STATE	CHAR_DESC	WASTE_DESC	SIC_DESC
ON0486800	WEB PRESS (THUNDER BAY) LTD.		667 BEAVERHALL PLACE	THUNDER BAY	329696	5360653	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	NEWSPAPER, ETC. IND.
ON0486801	WEB PRESS (THUNDER BAY) LTD.	866 TUNGSTEN STREET		THUNDER BAY	333135	5364907	L	LEACHATE TOXIC	PHOTOPROCESSING WASTES	NEWSPAPER, ETC. IND.
ON1906400	WEQUEDONG LODGE OF THUNDER BAY	1703 E. VICTORIA AVE., SUITE 209		THUNDER BAY	332681	5361521	S	PATHOLOGICAL	PATHOLOGICAL WASTES	OTHER HEALTH/SOC. ASSOC.
ON1906402	WEQUEDONG LODGE OF THUNDER BAY	198 N COURT STREET		THUNDER BAY			S	PATHOLOGICAL	PATHOLOGICAL WASTES	OTHER HEALTH/SOC. ASSOC.
ON1906401	WEQUEDONG LODGE OF THUNDER BAY	228 S ARCHIBALD STREET		THUNDER BAY			S	PATHOLOGICAL	PATHOLOGICAL WASTES	OTHER HEALTH/SOC. ASSOC.
ON1737200	WESTERN (OUT OF BUS)	274 KINGSTON STREET		THUNDER BAY			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	MACHINE SHOP IND.
ON2183100	WESTERN GRAIN BY-PRODUCTS STORAGE LTD.	201 KINGSTON STREET		THUNDER BAY	330972	5358964	L	PCB WASTE	PCB'S	GRAIN ELEVATOR IND.
ON0187112	WESTINGHOUSE CANADA INC.	635 MOUNTDALE AVENUE		THUNDER BAY	330005	5360723	L	LIQUID INDUSTRIAL WASTE	ALKALINE WASTES - HEAVY METALS	OTHER ELECT. EQUIP.
ON0187112	WESTINGHOUSE CANADA INC.	635 MOUNTDALE AVENUE		THUNDER BAY	330005	5360723	S	PCB WASTE	PCB'S	OTHER ELECT. EQUIP.
ON0187112	WESTINGHOUSE CANADA INC.	635 MOUNTDALE AVENUE		THUNDER BAY	330005	5360723	L	LEACHATE TOXIC	OIL SKIMMINGS & SLUDGES	OTHER ELECT. EQUIP.
ON0187112	WESTINGHOUSE CANADA INC.	635 MOUNTDALE AVENUE		THUNDER BAY	330005	5360723	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	OTHER ELECT. EQUIP.
ON1776300	WILCO LANDSCAPE CONTRACTORS LTD.	1970 BROADWAY AVE.		THUNDER BAY	325688	5358619	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FENCING INSTALLATION
ON1678000	WILDON WIRING LIMITED	475 ELEVENTH AVENUE		THUNDER BAY	334004	5364390	L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	ELECTRIAL WORK
ON2329600	WOODLOT FORESTRY SERVICE	3501 OLIVER ROAD		OLIVER & PAIPOONGE TWP.			L	LIQUID INDUSTRIAL WASTE	WASTE OILS & LUBRICANTS	FOREST SERVICES

Table H-7
Thunder Bay - Waste Manifests

GEN NO.	GENERATOR NAME	ADDRESS 1	ADDRESS 2	EASTING	NORTHING
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)			
ON0519300	A-1 OIL SERVICES LTD.	LOT 13, CONCESSION 1 (N. OF RIVER)			
ON0008610	ABITIBI-PRICE INC	NW INTERSECTION HWYS 811 & 527	CAMP GARAGE 230, FMA 500700		
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE			
ON0008600	ABITIBI-PRICE INC.	STRATHCONA AVENUE			
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0008601	ABITIBI-PRICE INC.	1735 CITY ROAD		335602	5356646
ON0458604	ATWAY TRANSPORT INC.	2781 HIGHWAY #17			
ON0859200	BEARSKIN AIRLINES	216 ROUND BLVD.	HANGAR #2	328863	5360156
ON0859200	BEARSKIN AIRLINES	216 ROUND BLVD.	HANGAR #2	328863	5360156
ON0470700	BEATRICE FOODS INC. 04-068	134 SOUTH WATERLOO STREET		332408	5361324
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		330000	5361002
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		330000	5361002
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		330000	5361002
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		330000	5361002
ON0474000	BELL CANADA	605 BEAVERHALL PLACE		330000	5361002
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON0459700	BOMBARDIER INC	1001 MONTREAL STREET		329586	5358748
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856301	BOWATER PULP & PAPER CANADA INC.	S.E. SECTOR OF THUNDER BAY , ADJACENT TO	DND RIFLE RANGE (	328916	5357767

Table H-7
Thunder Bay - Waste Manifests

GEN NO.	GENERATOR NAME	ADDRESS 1	ADDRESS 2	EASTING	NORTHING
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856302	BOWATER PULP & PAPER CANADA INC.	2001 NEEBING AVENUE		328916	5357767
ON1856301	BOWATER PULP & PAPER CANADA INC.	S.E. SECTOR OF THUNDER BAY , ADJACENT TO	DND RIFLE RANGE (	328916	5357767
ON0040016	BROWNING-FERRIS INDUSTRIES	122 COOPER ROAD			
ON0040016	BROWNING-FERRIS INDUSTRIES	122 COOPER ROAD			
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		335246	5364906
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		335246	5364906
ON0380301	CANADA MALTING CO LIMITED	579 MAUREEN STREET, PO BOX 579		335246	5364906
ON0269109	CANADIAN BLOOD SERVICES	1165 BARTON STREET		332794	5363418
ON0196502	CANADIAN COAST GUARD BASE	KEEFER TERMINAL	100 MAIN STREET	335663	5364015
ON0196502	CANADIAN COAST GUARD BASE	KEEFER TERMINAL	100 MAIN STREET	335663	5364015
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP		
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP		
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.		
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.		
ON0013108	CANADIAN NATIONAL RAILWAY COMPANY	NEEBING YARD, NEEBING & MURPHY AVENUES	BETWEEN ROSSLYN RD. & BROADWAY AVE.		
ON0013136	CANADIAN NATIONAL RAILWAY COMPANY	"C" YARD, (ADJACENT TO TRACK TC06)	ELECTRICAL BLDG. & EQUIPMENT SHOP		
ON0048123	CANADIAN PACIFIC LIMITED	C.P. RAIL STATION - THUNDER BAY	440 SOUTH SYNDICA	333603	5360787
ON0048123	CANADIAN PACIFIC LIMITED	C.P. RAIL STATION - THUNDER BAY	440 SOUTH SYNDICA	333603	5360787
ON0048113	CANADIAN PACIFIC LIMITED	MECHANICAL SHOP	PLAN 54, BLOCK 60, LOT 13-22		
ON0348400	CARGILL LIMITED	DARREL AVENUE (MISSION ROAD)	TERMINAL ELEVATOR		
ON1171900	CLARA INDUSTRIAL SERVICES LTD	1130 COMMERCE STREET		329821	5360214
ON1171900	CLARA INDUSTRIAL SERVICES LTD	1130 COMMERCE STREET		329821	5360214
ON1258600	DINGWELL'S MACHINERY & SUPPLY LTD	963 ALLOY DRIVE		333416	5364218
ON1484200	E.J. BILOSKI & CO. LTD. 14-957	737 MELBOURNE ROAD		331760	5374328
ON2252300	ENVIROTEST LABS THUNDER BAY ANALYTICAL	1081 BARTON STREET		332811	5363727
ON0314801	ERB TRANSPORT LTD.	580 EIGHTH AVENUE		333587	5364713
ON1586201	ESSO PETROLEUM CANADA	SITE 11 CORNER OF MOUNT BALDY ROAD &	HWY #527 NORTH		
ON0000712	ESSO PETROLEUM CANADA	THUNDER BAY AIRPORT	308 HECTOR DOUG/	328387	5360107
ONF034301	EVEREST FUNERAL CHAPEL LIMITED	420 WEST GORE STREET		330508	5359252
ONF034300	EVEREST FUNERAL CHAPEL LIMITED	299 WAVERLEY STREET		335359	5367274
ON1895800	FABMAR METALS INC.	1019 PACIFIC AVENUE		335236	5362601
ON0925400	GENERAL SCRAP PARTNERSHIP	305-104TH STREET		333947	5360390
ON0464300	HOGARTH-WESTMOUNT HOSPITAL 20-091	300 LILLIE STREET NORTH		331818	5361831
ON0464300	HOGARTH-WESTMOUNT HOSPITAL 20-091	300 LILLIE STREET NORTH		331818	5361831
ON2009200	HOLLAND TRUCKING	LOT 43, CONCESSION B			
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		335374	5362603
ON0000714	IMPERIAL OIL	PACIFIC & 110TH STREET		335374	5362603
ON1928102	INLAND TECHNOLOGIES INC.	100 PRINCESS STREET	THUNDER BAY INTE	328856	5360297

Table H-7
Thunder Bay - Waste Manifests

GEN NO.	GENERATOR NAME	ADDRESS 1	ADDRESS 2	EASTING	NORTHING
ON0316401	IRON RANGE BUS LINES INC.	OLIVER ROAD AND GOLFLINKS ROAD			
ON0899500	J.U. CALONEGO CONSTRUCTION LTD.	1250 ROSSLYN ROAD		328554	5359073
ON1926700	KEVIN HYATT TRUCKING	160 LAKESHORE DRIVE			
ON1167000	LAC DES ILES MINES LTD.	MINING LEASES CLAIM 251,252,253&254			
ON1167000	LAC DES ILES MINES LTD.	MINING LEASES CLAIM 251,252,253&254			
ON1167000	LAC DES ILES MINES LTD.	MINING LEASES CLAIM 251,252,253&254			
ON0213951	LAFARGE CANADA INC.	360 WILLIAM STREET EAST		334389	5363162
ON0430015	LAFARGE CONSTRUCTION MATERIALS 21-174	771 FORT WILLIAM ROAD		334341	5364247
ON0053641	LAIDLAW TRANSIT LIMITED	2100 MOUNTDALE AVENUE		330028	5358396
ON0053641	LAIDLAW TRANSIT LIMITED	2100 MOUNTDALE AVENUE		330028	5358396
ON1221800	LAKEHEAD DIST. CATHOLIC SCHOOL BOARD	ST. PATRICK HIGH SCHOOL	621 SELKIRK AVENU	332582	5360460
ON0793314	LAKEHEAD DISTRICT SCHOOL BOARD	GRON MORGAN HIGH SCHOOL	174 MARLBOROUGH	333889	5366996
ON0447801	LAKEHEAD FREIGHTWAYS INC.	161 MAIN STREET		335246	5363934
ON0447801	LAKEHEAD FREIGHTWAYS INC.	161 MAIN STREET		335246	5363934
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		332748	5365644
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		332748	5365644
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		332748	5365644
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		332748	5365644
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		332748	5365644
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		332748	5365644
ON0112000	LAKEHEAD UNIVERSITY	OLIVER ROAD		332748	5365644
ON0323901	LEBRUN NORTHERN CONTRACTING LTD.	1160 CARRICK STREET		333425	5363441
ON0295400	LEHTO PRINTERS LIMITED (1989)	1081 RUSSELL STREET		333235	5363717
ON0116502	MCASPHALT INDUSTRIES LIMITED	305 CITY ROAD			
ON0116502	MCASPHALT INDUSTRIES LIMITED	305 CITY ROAD			
ON0463302	MCKEVITT TRUCKING LIMITED	1200 CARRICK ST.		333366	5363348
ON0116747	MDS LABORATORY SERVICES	PORT ARTHUR CLINIC	194 NORTH COURT	336042	5367827
ON0116765	MDS LABORATORY SERVICES	1265 EAST ARTHUR STREET	SUITE 400	332980	5361117
ON0124010	MINISTRY OF HEALTH	THUNDER BAY PUBLIC HEALTH LABORATORY	336 SOUTH SYNDIC/	333592	5360920
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR	327331	5361031
ON0124130	MINISTRY OF NATURAL RESOURCES	SERVICE CENTRE/ AIROPS HANGAR	1580 WEST ARTHUR	327331	5361031
ON0282602	MINISTRY OF TOURISM & RECREATION	OLD FORT WILLIAM, KING'S ROAD	1/2 MILE N. OF BROADWAY AVENUE		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		

Table H-7
Thunder Bay - Waste Manifests

GEN NO.	GENERATOR NAME	ADDRESS 1	ADDRESS 2	EASTING	NORTHING
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON0124216	MINISTRY OF TRANSPORTATION	MTO DISTRICT #61 - THUNDER BAY	(SEE SCHEDULE "B")		
ON1542401	NESTE CHEMICALS CANADA INC.	1100 MONTREAL STREET			
ON2259800	NIDERO CONSTRUCTION (OUT OF BUSINESS)	1520 DAWSON ROAD		331374	5370404
ON0421104	NORANDA MINING AND EXPLORATION INC.	960 ALLOY DRIVE		333332	5364213
ON0397600	NORTH WEST HYDRAULICS LTD	1095 ROLAND STREET		333029	5363678
ON0397600	NORTH WEST HYDRAULICS LTD	1095 ROLAND STREET		333029	5363678
ON0442900	NORTHERN WOOD 28-114	1 MAUREEN STREET			
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		331338	5364393
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		331338	5364393
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		331338	5364393
ON1755500	NORTHLAND SUPERIOR SUPPLY CO. LTD.	1131 CENTRAL AVENUE		331338	5364393
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		331446	5364686
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		331446	5364686
ON0490400	ONTARIO HYDRO SERVICES COMPANY	205 BURWOOD ROAD		331446	5364686
ON0490428	ONTARIO HYDRO SERVICES COMPANY	BURWOOD MAINTENANCE CENTRE	255 BURWOOOD ROAD		
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND		
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND		
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND		
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND		
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND		
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND		
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND		
ON0018419	ONTARIO HYDRO THUNDER BAY GS	108TH AVENUE	MISSION ISLAND		
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		329827	5360628
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		329827	5360628
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		329827	5360628
ON0490033	ONTARIO HYDRO/NORTHWEST HYDRO	680 BEAVERHALL PLACE		329827	5360628
ON2179700	PARRISH & HEIMBECKER LTD.	101 MAUREEN STREET			
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD		
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD		
ON0475700	PASCOL ENGINEERING	401 SHIPYARD ROAD	GRENVILLE AVENUE & SHIPYARD ROAD		
ON0031025	PETRO-CANADA PRODUCTS	DISTRIBUTION TERMINAL	300-106TH STREET ,	333983	5360175
ON0031025	PETRO-CANADA PRODUCTS	DISTRIBUTION TERMINAL	300-106TH STREET ,	333983	5360175
ON1607901	PIERRE GAGNE CONTRACTING LTD	580 NEW VICKERS STREET		333284	5360220
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST		

Table H-7
Thunder Bay - Waste Manifests

GEN NO.	GENERATOR NAME	ADDRESS 1	ADDRESS 2	EASTING	NORTHING
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST		
ON0776200	POTTER PUMPING SERVICES LTD	LOT 3, CONC 2	HWY 17 WEST		
ON1741900	PROVINCIAL PAPERS INC.	SHIPYARD ROAD			
ON1935800	RAINBOW PRINTERS LTD.	380 MOONEY STREET		334405	5364148
ON0443300	RAISIO CHEMICALS CANADA, INC.	701 NORAH CRESCENT		332992	5362809
ON1268900	RIVER LAKE TIMBER (1991) LTD.	636 SQUIRESTREET			
ON0396402	SASKATCHEWAN WHEAT POOL	TERMINAL 7, MAUREEN STREET			
ON1740101	SHUNIAH FOREST PRODUCTS LIMITED	MINING LOCATION 8, PARTS 3&4			
ON0450300	ST. JOSEPH'S GENERAL HOSPITAL	ALGOMA STREET			
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST			
ON1606300	STERLING PULP CHEMICALS LTD.	1535 CITY ROAD EAST			
ON1736800	STURGEON TIMBER LIMITED	LOT 2, CONCESSION 3	R.R. #1		
ON1736800	STURGEON TIMBER LIMITED	LOT 2, CONCESSION 3	R.R. #1		
ON1222900	TAIGA TRUCKING ONTARIO 1980 INC.	2689 FIRE LOCATION	LOT 4, CONC. 2, ARTHUR STREET WEST		
ON1788503	THUNDER AIRLINES LIMITED	310 HECTOR DOUGALL WAY		328387	5360107
ON0922100	THUNDER BAY AUTO PARTS, DIV. OF	520 SQUIER STREET			
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		336543	5367670
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		336543	5367670
ON0171700	THUNDER BAY HYDRO	37 FRONT STREET		336543	5367670
ON0171707	THUNDER BAY HYDRO	187 WINDEMERE AVENUE	#21 SUBSTATION	333829	5367293
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		339927	5370905
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		339927	5370905
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		339927	5370905
ON1868302	THUNDER BAY PACKAGING INC.	965 STRATHCONA AVENUE		339927	5370905
ON0330901	THUNDER BAY REGIONAL HOSPITAL	460 NORTH COURT STREET		336933	5368590
ON0330901	THUNDER BAY REGIONAL HOSPITAL	460 NORTH COURT STREET		336933	5368590
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		333398	5360996
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		333398	5360996
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		333398	5360996
ON0330900	THUNDER BAY REGIONAL HOSPITAL	325 SOUTH ARCHIBALD STREET		333398	5360996
ON0346700	THUNDER BAY TERMINALS LTD.	PART 8, REG. PLAN 55R-2639	MCKELLAR ISLAND		
ON0392912	THUNDER BAY, CITY OF	9427 JOHN STREET ROAD	RR #11	323855	5367145
ON0392908	THUNDER BAY, CITY OF	TELECOMMUNICATIONS DEPARTMENT	1050 LITHIUM DRIVE		
ON0392905	THUNDER BAY, CITY OF	ATLANTIC AVENUE WPCP			
ON0392902	THUNDER BAY, CORP. OF THE CITY OF	MAINTENANCE DIVISION	155 FRONT STREET	336829	5367887
ON0508103	TIMES-NEWS/CHRONICLE-JOURNAL	75 CUMBERLAND STREET SOUTH		335657	5366688
ON0998000	TOM JONES CONSTRUCTION	560 SQUIRE PLACE			
ON0176204	TRIMAC TRANSPORTATION SERVICES INC.	1591 ROSSLYN ROAD		327265	5359277
ON0178279	UNION GAS LIMITED	PART OF LOT 7, CONCESSION 3			
ON1447801	VOLUME TANK TRANSPORT INC.	2090 MOUNTDALE AVENUE		330063	5358411

Table H-7
Thunder Bay - Waste Manifests

GEN NO.	GENERATOR NAME	ADDRESS 1	ADDRESS 2	EASTING	NORTHING
ON1776300	WILCO LANDSCAPE CONTRACTORS LTD.	1970 BROADWAY AVE.		325688	5358619

Table H-8
Thunder Bay - Waste Carriers

CAR_NO	CAR_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing
A009045	J.U. CALONEGO CONSTRUCTION LIMITED	1250 ROSSLYN ROAD		THUNDER BAY	328554	5359073
A009135	POTTER PUMPING SERVICES LTD.	RR#2, 2665 WEST ARTHUR ST.		THUNDER BAY		
A900105	CLARA INDUSTRIAL SERVICES	P.O. BOX 906	1130 COMMERCE STREET	THUNDER BAY	329821	5360214
A900123	LEMPIALA SAND & GRAVEL LTD. (DUST)		364 FITZGERALD STREET	THUNDER BAY	336605	5368811
A900131	ONTARIO HYDRO (DUST)	THUNDER BAY THERMAL GENERATING STATION	C/O BOX 816	THUNDER BAY		
A900138	A-1 OIL SERVICES LTD.		R.R. #5, ARTHUR STREET	THUNDER BAY		
A900148	HOGARTH-WESTMOUNT HOSPITAL		300 NORTH LILLIE STREET	THUNDER BAY	331818	5361831
A900152	MINISTRY OF TRANSPORTATION (DUST)	615 ST. JAMES STREET	C/O P.O. BOX 1177	THUNDER BAY		
A900153	A-1 SEWAGE SERVICES LTD. (DUST)		R.R. #5, ARTHUR STREET	THUNDER BAY		
A900169	DUNCAN ENTERPRISES INC., B.U.	1177 ROLAND STREET	C/O P.O. BOX 302	THUNDER BAY	333017	5363348
A900170	JACK CONNELL TRUCKING, O/A	WALTER J. CONNELL	224 PICTON AVENUE	THUNDER BAY	332845	5368100
A900178	NIPIGON DISTRICT MEMORIAL HOSPITAL	148 CHURCH STREET		NIPIGON		
A900180	LAKEHEAD PSYCHIATRIC HOSPITAL		580 NORTH ALGOMA STREET	THUNDER BAY		
A900185	BILOSKI CONTRACTORS LTD.	R.R. # 17, OLIVER ROAD		THUNDER BAY		
A900203	ARNONE TRANSPORT LIMITED (DUST)	300 SOUTH WATER STREET	C/O P.O. BOX 2335	THUNDER BAY	335414	5366343
A900232	MR. MIKE RACIOPPI	RACIOPPI ENTERPRISES LIMITED	522 COUNTY BOULEVARD	THUNDER BAY	334231	5370030
A900247	BIOCAN WASTE MANAGEMENT SYSTEMS O/A,	864226 ONTARIO INC.	R.R.#2, 3225 20TH SIDE ROAD	THUNDER BAY	325127	5360975
A900259	BRUCE JAMES HALOW	P.O.BOX 414		THUNDER BAY		
A900268	THUNDER BAY, THE HYDRO ELECTRIC	COMMISSION OF	34 NORTH CUMBERLAND STREET	THUNDER BAY		
A900282	A-1 SEWAGE SERVICES (1989) LTD.	R.R.#5, ARTHUR STREET		THUNDER BAY		
A900283	AL'S SEWAGE SERVICES INC.	SITE #1, BOX 28,	R.R.#5, ROSSLYN ROAD	THUNDER BAY		
A900396	DONALD JAMES WITHERSPOON	BOX 100		DEVLIN		
A900461	THUNDER BAY TERMINALS LTD.	MCKELLAR ISLAND	P.O. BOX 1800, STATION F	THUNDER BAY		
A900526	THUNDER AIRLINES LIMITED	310 HECTOR DOUGALL WAY		THUNDER BAY	328280	5360063
A910357	LAKEHEAD FREIGHTWAYS INC.	774 FIELD STREET		THUNDER BAY		

Table H-9
Thunder Bay - Waste Receivers

REC_NO	REC_NAME	SITE_ADRS1	SITE_ADRS2	CITY	Easting	Northing	REC_DESC
RRPCB1060	SASKATCHEWAN WHEET POOL INC.	POOL #4 SHIPYARD ROAD		THUNDER BAY			TRANSFER STATION
A590138	PPM CANADA INC.	ABITIBI PRICE / TWP.MACGREGOR, HERRICK	C/O TOR.STAR BLDG., 1 YONGE ST., #801	THUNDER BAY			RECLAIM
601-91A003	PUBLIC WORKS CANADA, GVT.SERVICES CANADA	221 N. ARCHIBALD STREET		THUNDER BAY	333452	5361712	TRANSFER STATION
PATH0120	THUNDER BAY REGIONAL(SEE & USE A770146)	460 NORTH COURT STREET		THUNDER BAY	336933	5368590	INCINERATION
PATH0100	MCKELLAR GENERAL HOSPITAL		325 SOUTH ARCHIBALD STREET	THUNDER BAY	333398	5360996	INCINERATION
4-0006-91-947	AVENOR INC. / BOWATER PULP & PAPER	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	WATER POLLUTION CONTROL PLANT
4-0006-91-006	CANADIAN PACIFIC FOREST PRODUCTS LTD.	2001 NEEBING AVENUE		THUNDER BAY	328916	5357767	WATER POLLUTION CONTROL PLANT
W124805	THUNDER BAY WPCP		500 DONALD STREET EAST	THUNDER BAY			WATER POLLUTION CONTROL PLANT
RRPCB1070	GOVERNMENT SERVICES CANADA	110-221 NORTH ARCHIBALD STREET		THUNDER BAY	333452	5361712	TRANSFER STATION
601-86A009	THUNDER BAY HYDRO	37 FRONT STREET		THUNDER BAY			TRANSFER STATION
601-92A001	WATER POLLUTION CONTROL PLANT	ATLANTIC AVENUE WPCP	C/O 500 DONALD ST.E.	THUNDER BAY			TRANSFER STATION
A770146	THUNDER BAY REGIONAL HOSPITAL	460 N. COURT STREET	PORT ARTHUR SITE	THUNDER BAY	333398	5360996	TRANSFER STATION
A591104	POTTER PUMPING SERVICES LIMITED	2665 WEST ARTHUR STREET	C/O R.R.#2 WEST ARTHUR STREET	THUNDER BAY			TRANSFER STATION
601-85A005	ONTARIO HYDRO	LAKEHEAD TRANSFORMER STN.,LAKESHORE DR.	C/O 34 CUMBERLAND ST. "N"	THUNDER BAY			TRANSFER STATION
A591103	A-1 SEWAGE SERVICES LTD	ARTHUR STREET		THUNDER BAY			TRANSFER STATION
A590106	THUNDER BAY, THE CORP. OF THE CITY OF	500 DONALD STREET EAST		THUNDER BAY			TRANSFER STATION
601-93A005	LAKEHEAD BOARD OF EDUCATION	108 AVE SITE,MISSION ISLAND	C/O 2135 SILLS ST.	THUNDER BAY			TRANSFER STATION
601-88A205	AVENOR INC.	2001 NEEBING AVE.		THUNDER BAY	328916	5357767	TRANSFER STATION
601-89A010	856595 ONT. LTD. C/O MCCARTHY &	MCCARTHY PCB	MAIN ST. LOTS 35-38	THUNDER BAY			TRANSFER STATION
601-91A002	TRANSPORT CANADA	100 PRINCESS STREET	THUNDER BAY AIRPORT	THUNDER BAY	328856	5360297	TRANSFER STATION
RRPCB1140	TRANS CANADA PIPELINES	COMPRESSOR STATION #69 (EAGLEHEAD)		THUNDERB BAY			TRANSFER STATION
601-91A006	ONTARIO HYDRO-BURWOOD ROAD-SHED	205 BURWOOD ROAD, LARGE SHED	T.B. AREA OFFICE/SERVICE CENTRE	THUNDERBAY	331446	5364686	TRANSFER STATION

Table H-10
Summary of Cemetery Information

County/ District	Municipality/ Geographic Location	Cemetery Name and Location	Easting	Northing
Thunder Bay District	Blake Twp.	St. Benedict's Church Cemetery, Con. 1, Lot 10		
Thunder Bay District	Coldwell Twp.	1. Coldwell Twp. Cemetery (2 stones - Coldwell and Nicholl)		
Thunder Bay District	Conmee Twp.	1. Conmee Twp. Municipal Cemetery, 2 miles west of Kakabeka Falls	315360	5368381
Thunder Bay District	Crooks Twp.	1. Cloud Bay Municipal Cemetery, Conc. 3, Lot 11	327989	5358162
Thunder Bay District	Devon Twp.	Makela Family Cemetery, Con. 4, Lot 46		
		Backstrom Family Cemetery, Con. 3, Lot 17		
Thunder Bay District	Dorion Twp.	1. Dorion Mountainside Municipal Cemetery, Conc. 4, Lot 13	373218	5380167
		2. St. Isidore Roman Catholic Cemetery, Conc. 3, Lot 8, Dorion Loop Rd.	385402	5405701
Thunder Bay District	Forbes Twp.	Sunshine Cemetery, Con. 1, Lot 18	301947	5380219
Thunder Bay District	Forbes Twp.	1. Sunshine Cemetery, Dawson Road, Conc. 1, Lot 8	304626	5366013
Thunder Bay District	Gillies Twp.	Pinegrove Cemetery, Con. 5, Lot 6	298560	5353725
Thunder Bay District	Gillies Twp.	1. Hymers Riverside Municipal Cemetery, Hymers, Ont.	298099	5356087
Thunder Bay District	Gorham Twp.	1. New Lappe Community Lutheran Cemetery, Conc. 5, Lot 16	385301	5405275
		2. Tarmola Community Cemetery, Near Stepstone, Conc. 3, Lot 7		
		3. Old Lappe Community Lutheran Cemetery, Conc. 4, Lot 17	326290	5384537
		4. Korkonan Family Cemetery, Conc. 2, Lot 11 (private, non-existent)		
		5. Tunnenem Family Cemetery (private, non-existent)		
Thunder Bay District	Lybster Twp.	1. Leeper Cemetery, Old Silver Mountain Road and Townline		
		2. Nolalu Cemetery, 2 km west of Nolalu village on Hwy. 588	300619	5380786
Thunder Bay District	McIntyre Twp.	Kivikoski Cemetery, Con. B, Lot 16		
Thunder Bay District	McIntyre Twp.	1. Huotari Family Cemetery (private), Conc. 8, Lot 2		
		2. Kaipainen Family Cemetery, SE1/2, Section 5 (private)		
		3. Smedberg-Lehto Family Cemetery, NW1/4, Section 9		
		4. Waris Family Cemetery, SE1/4. Section 5		
Thunder Bay District	Neebing Twp.	1. Mountainview Cemetery - early burials, 1884-1902		
Thunder Bay District	O'Connor Twp.	O'Connor Cemetery, Con. 7, Lot 1	298506	5353543
		St. Pius R.C. Cemetery, Con. 3, Lot 2		
Thunder Bay District	O'Connor Twp.	Free Methodist Cemetery, Con. 1, Lot 9	290626	5352292
Thunder Bay District	Oliver Twp.	Kakabeka Falls Cemetery - only three graves		
		Old Baptist Cemetery, Con. 3, Lot 1		
Thunder Bay District	Oliver Twp.	St. James' Cemetery, Murillo, Con. 3, Lot 7, N. Pt.	326210	5382761
Thunder Bay District	Paipoonge Twp.	Stanley Hill Cemetery, Con. 2, Lot 32	310183	5361818

Table H-10
Summary of Cemetery Information

County/ District	Municipality/ Geographic Location	Cemetery Name and Location	Easting	Northing
Thunder Bay District	Scoble Twp.	Trinity Lutheran Cemetery, Con. 4, Lot 1		
Thunder Bay District	Sibley Twp.	1. Salem Lutheran Cemetery at Pass Lake	333720	5376044
Thunder Bay District	Squaw Bay Reserve	Squaw Bay Indian Cemetery		
Thunder Bay District	Strange Twp.	Private Cemetery, Con. 3		
Thunder Bay District	Strange Twp.	1. St. John's Anglican Cemetery at Red River Road (abandoned - 1998 report only)		
Thunder Bay District	Thunder Bay City	Mountain View Cemetery	326593	5361304
Thunder Bay District	Thunder Bay City	St. Patrick's R.C. Cemetery, Broadway Ave.	328255	5358365
Thunder Bay District	Thunder Bay City	Brown's, Dawson Rd. and/or St. John's Cemetery, Red River Road at Algonguin Street		
		Fort William Burying Ground / Old Presbyterian Cemetery, (non-existent)		
		St. Andrew's R. C. Cemetery, North Algoma Street at River Street		
Thunder Bay District	Thunder Bay City	1. Old Fort William Burying Ground, bank of Kaministikwia River; is a list of early burials before	328228	5357821
		2. Old St. John's Anglican/St. Michael's/Brown's, Red River Road (formerly in Port Arthur) (from burials		
		3. St. Andrew's Roman Catholic Cemetery, 690 Oliver Rd., Thunder Bay	333149	5366304
		4. Ukrainian Catholic Cemetery, West Arthur St., (f. Neebing Twp.)	333720	5367938
		4. Ukrainian Catholic Cemetery, West Arthur St., (f. Neebing Twp.)	326580	5361314
		5. Riverside Cemetery, 800 Oliver Rd., Thunder Bay (was Port Arthur, Ont.)	332966	5366240
		6. Mountain View, South Expansion added 1999	328263	5358373
Thunder Bay District	Thunder Bay City	1. Riverside Cemetery, 800 Oliver Rd., Thunder Bay (was Port Arthur, Ont.)		
		2. Mountain View, South Expansion added 1999		
Thunder Bay District	Ware	2. Ware-Gorham Cemetery, Conc. 2, Lot 1 (abandoned) (private)		
Thunder Bay District	Ware Twp.	Cemetery Reserve (/), Con. 7, Lot 10, S 1 / 2		
		Ware-Gorham (Abandoned), Con. 2, Lot 1, Maplewood Road		

BURNSIDE

Appendix I
Wellhead Protection from Other Jurisdictions

New Brunswick

UNDERSTANDING THE LAW:

AN OVERVIEW OF NEW BRUNSWICK'S WELLFIELD PROTECTED AREA DESIGNATION ORDER

What is Groundwater?

Groundwater begins as precipitation which falls to earth. Once on the ground, the water may flow as runoff into streams, lakes and rivers, evaporate directly into the atmosphere or become absorbed by vegetation. A substantial quantity, however, seeps or permeates down through soil and bedrock and is stored as groundwater. Groundwater tends to concentrate within thick layers of sand and gravel that were deposited by glaciers thousands of years ago, or to gather along rock fractures. Permeable layers of rock or soil that are saturated in groundwater are called **aquifers** and can be drilled to obtain wellwater. Under normal circumstances, aquifers are replenished regularly by natural processes.

Wellfield Protection is Everyone's Business

New Brunswickers obtain their water from one of two main sources: inland bodies of surface water such as lakes and rivers; or groundwater. A **wellfield** is one well or a group of wells that together supply a public water system. Both private wells and municipal wellfields obtain their water supplies from groundwater. Consider these facts:

- More than 150,000 New Brunswickers in over fifty municipalities rely on municipal wellfields that are fed by groundwater.
- It costs much more – sometimes two hundred times more – to clean a seriously contaminated municipal wellfield or to find an alternate water supply, than to protect the well properly in the first place.
- Some New Brunswick communities may not even have an alternate water supply if their existing wellfield becomes contaminated.

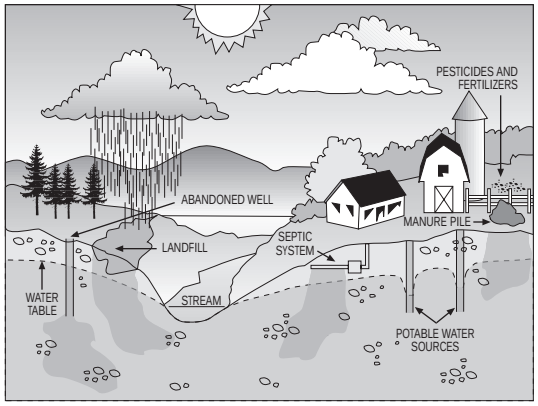
Residential and commercial activities carried out above a well or wellfield can directly influence the quality of drinking water for an entire community. Unfortunately, many land use activities have the potential to contaminate wellfields, most often from chemicals that have been used, discarded, spilled or stored incorrectly.

How Does Groundwater Become Contaminated?

The area of land that provides water to a wellfield is called the **recharge area**. Contaminants usually enter the aquifer through recharge water from the surface. When harmful bacteria or chemical substances enter the recharge area, the contaminated water can seep into the well and become an issue for those who depend on the wellfield for their drinking water. There are five general groups of contaminants:

- Bacteria and viruses
- Petroleum products and solvents
- Chlorinated solvents
- Pesticides
- Inorganic contaminants including nitrates and salts

CONTAMINATION



How The Wellfield Protected Area Designation Order Works

It makes far more sense to prevent water contamination in the first place, which is why the New Brunswick government developed the Wellfield Protected Area Designation Order. The goal of the Program is the identification and designation of **Protected Areas**, which encompass

New Nouveau Brunswick
Environment and Local Government

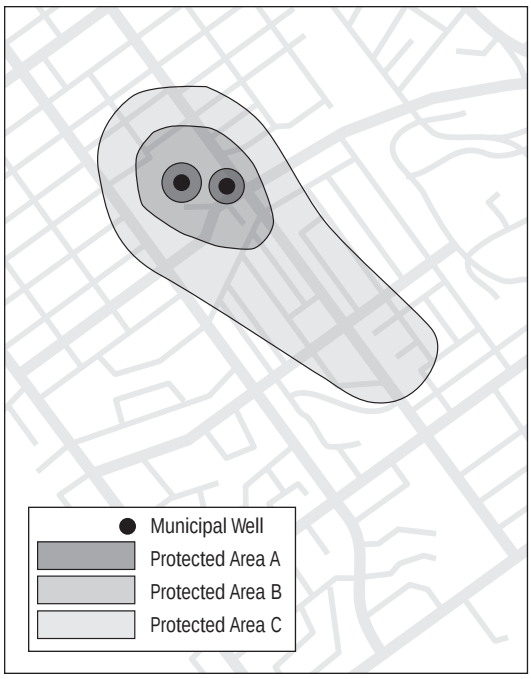
the entire recharge area associated with and surrounding a wellfield. Each Protected Area around a municipal wellfield is divided into three smaller zones: Zone A, Zone B and Zone C. The zones reflect the three most significant types of groundwater contaminants, based on the fact that different contaminants persist in the environment for different time frames, move at different rates and pose different health risks.

Zone A lies closest to the wellhead and therefore poses the highest risk of pollution. It consequently has the greatest number of controls on chemical storage and activities that might affect the municipal wellfield. The Designation Order states that septic tanks, sewer lines, petroleum products, chlorinated solvents, pesticides and similar chemicals or activities be controlled or in some cases restricted within this zone. Its outer boundary surrounds the area where the potential for living organisms such as bacteria or viruses exists. Potential bacterial contaminants such as manure or new septic tanks are more restricted in this zone.

Zone B lies more distant from the wellhead and surrounds Zone A. The risk of bacterial contamination from land use is greatly reduced in Zone B, but significant pollution risks still persist from petroleum products, chlorinated solvents or other persistent chemicals or activities.

Zone C surrounds Zones A and B and is located furthest from the wellhead. Controls on some chemicals or activities are much less stringent in Zone C but still are required for chlorinated solvents, petroleum products, and groundwater extraction.

PROTECTED AREAS



Common Questions

Am I Affected by the Wellfield Protected Area Designation Order?

To find out whether your home or business is in a Protected Area, and how this will affect you, contact the Department of the Environment and Local Government or the local Service New Brunswick registry office. Your property identification number will assist in this process. This number is located on your New Brunswick Property tax form.

For more detailed information on vegetation control, pesticide use, petroleum and home heating oil storage tanks, fertilizers, livestock, manure storage, construction, and other activities in the three zones, please consult Understanding the Law: A Guide to the Wellfield Designation Order, or contact the Water Planning Officer at your nearest DELG office.

What if I Cannot Comply with the Wellfield Protected Area Designation Order?

Undoubtedly, some existing developments or activities inside a Protected Area will not conform with the Designation Order. Your recourse in this case is to request an exemption in writing from the Minister of the Environment and Local Government, available by calling the Sustainable Planning Branch at (506) 457-4846. Once you have filled out and submitted your Exemption Form, the Minister will either grant the exemption with specific conditions or refuse the request. A phase-out period will be provided for common non-conforming activities such as home heating oil tanks in Zone A.

How Will the Designation Order be Enforced?

Most New Brunswickers will voluntarily respect the Wellfield Protected Area Designation Order. The Department of the Environment and Local Government will designate municipal inspectors to complement the work of provincial inspectors to conduct audits and spot inspections. If convicted of Designation Order violations, individual offenders may be fined up to $50,000 and corporations up to $1,000,000 for each day that the violation continues.

For More Information

Ultimately, the Wellfield Protected Area Designation Order is for the benefit and well being of all members of the community. If you would like more information, please feel free to contact:

Sustainable Planning Branch
N.B. Department of the Environment and Local Government
P.O. Box 6000
Fredericton, New Brunswick
E3B 5H1
Telephone: (506) 457-4846 (call collect)
Facsimile: (506) 457-7823

Information about the Wellfield Protection Program is also on the Web at http://www.gnb.ca/0009/0371/0001/index.html.

NEW BRUNSWICK'S WELLFIELD PROTECTION PROGRAM

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WHAT IS A WELLFIELD PROTECTED AREA?

A wellfield protected area is the area (surface and subsurface) surrounding a water well or wellfield which supplies a public water supply system.

WHAT DOES THIS MEAN?

In a wellfield protected area, there are prohibitions or limitations on chemical storage and land use activities.

WHY DO WE HAVE THIS PROGRAM?

To protect municipal groundwater supplies in New Brunswick. The Provincial Government has embarked on a long-term program of WELLFIELD PROTECTION through DESIGNATION. This is a proactive approach to maintaining both the water quality and quantity of municipal groundwater supplies

Currently, there are 55 municipalities in New Brunswick which utilize approximately 200 production wells as their source of potable water. These wellfield protected areas cover an area of approximately 0.25 percent of the total area of the province, yet serve over 150,000 people (20 percent of the population of New Brunswick) with drinking water.

WHAT IS THE STATUS OF THIS PROGRAM?

At the present time the Wellfield Protected Area Designation Order - Clean Water Act, applies to four municipal wellfield protected areas, which are Doaktown, Shippagan, Tide Head and Plaster Rock. The goal of the Wellfield Protection program is to have all municipal wellfield protected areas designated by 2008.

WHERE DO I GET MORE INFORMATION?

For more information on the Wellfield Protection Program or about wellfield protection and how it relates to this property you can contact the Manager of the Wellfield Protection Program:

Shawn Hamilton, P. Eng.,
NB Department of the Environment & Local Government
Water Planning Section
20 McGloin Street, P.O. Box 6000
Fredericton, New Brunswick, E3B 5H1
Tel: (506)-444-2671 Fax: (506)-457-7823
E-mail at shawn.hamilton@gnb.ca

NEW BRUNSWICK'S WELLFIELD PROTECTION PROGRAM

WHAT IS A WELLFIELD PROTECTED AREA?

GUIDE TO NEW BRUNSWICK'S WELLFIELD PROTECTED AREA DESIGNATION ORDER - This Guide to the Wellfield Protected Area Designation Order relates specifically to municipal wellfields, and therefore applies to all municipalities, businesses and residences located within New Brunswick's designated municipal wellfield areas. The accompanying information on groundwater and its potential contaminants also will be of interest to those New Brunswickers who obtain their water from private wellfield sources (PDF Document Requires Adobe Acrobat Reader).

UNDERSTANDING THE LAW - An Overview of New Brunswick's Wellfield Protected Area Designation Order

ONLINE APPLICATION FORM - An application for an exemption to the Wellfield Protected Area Designation Order.

NEW BRUNSWICK WELLFIELD PROTECTION MAP AND DEPARTMENT OF THE ENVIRONMENT AND LOCAL GOVERNMENT REGIONAL BOUNDARIES

WELLFIELD PROTECTED AREAS - As part of New Brunswick's Wellfield Protection Program, the following communities have received designation under the Wellfield Protected Area Designation Order - *Clean Water Act.*

WELLFIELD PROTECTED AREA DESIGNATION ORDER - CLEAN WATER ACT. *(By clicking on this link you will be entering the New Brunswick Department of Justice website. To return to the Wellfield Protection Program website press your "back" button.)*

DEPARTMENT WINS INTERNATIONAL AWARD - The Department of the Environment and Local Government has been named a winner of an Outstanding Ground Water Protection Award for excellence in protecting ground water from contamination.

Protecting Sources of Municipal Drinking Water

An Overview of New Brunswick's Wellfield Protection Program

New Nouveau Brunswick
Department of the Environment and Local Government

For additional copies of this document, please contact:
The Communications and Educational Services Branch

Department of the Environment and Local Government
Tel: (506) 453-3700
Fax: (506) 453-3843

This Guide is also available on the Department's web site at the following address: http://www.gnb.ca/0009/0371/0001/index.html

Published in March 2005.

Why This Guide?

This Guide is designed to help you understand and comply with the Wellfield Protected Area Designation Order. It provides you with background information on groundwater, followed by an overview of common groundwater contaminants. It then examines the Designation Order by briefly explaining in plain language what is intended by each section.

Groundwater Protection is Everyone's Concern

New Brunswickers obtain their drinking water from one of two main sources: inland bodies of surface water such as lakes and rivers; or groundwater. Both private wells and municipal wells obtain their water supplies from groundwater. People who obtain their water from these sources should recognize that certain activities carried out around these wells could directly influence the quality of the drinking water. If a groundwater source becomes contaminated it can affect the lives of an individual or an entire community.

What is Groundwater?

Groundwater begins as precipitation, which falls to the earth. Once on the ground, the water may flow as runoff into streams, lakes and rivers; evaporate directly into the atmosphere or become absorbed by vegetation. A substantial quantity, however, seeps or permeates down through soil and bedrock and is stored as groundwater.

Groundwater may be stored within thick layers of sand and gravel or alternatively, in bedrock fractures. Porous layers of rock or soil that are saturated with groundwater are called **aquifers**, from which water can be extracted by the drilling of wells. A **wellfield** is a group of wells that together draw water from the aquifer to supply a public water system. Unfortunately, many land use activities associated with modern human settlements have the potential to contaminate wells.

How Does Groundwater Become Contaminated?

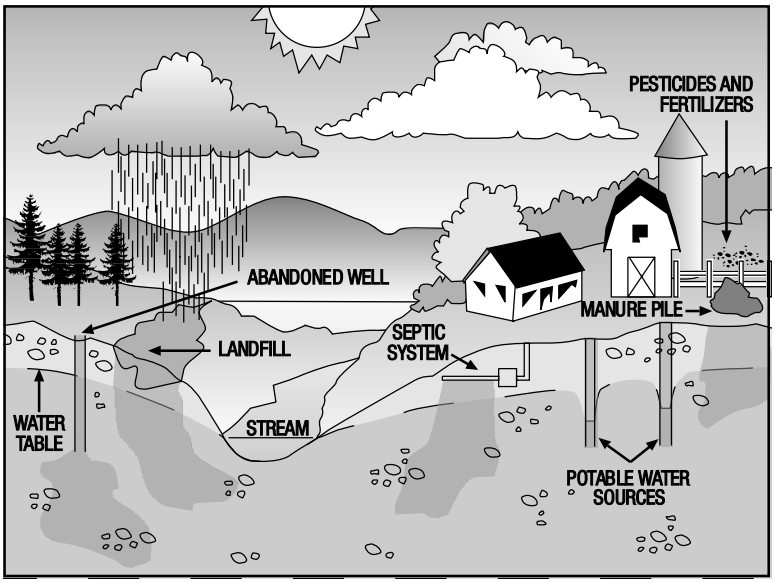
The area of land where water enters the aquifer is called the **recharge area**. Contaminants usually enter the aquifer through recharge water from the surface. When harmful bacteria or chemical substances contaminate an aquifer, the contaminated water may reach the well and become an issue for those who depend on the wellfield for their drinking water. There are five general groups of potential groundwater contaminants:

- Bacteria and viruses (Sources: septic systems/sewer lines, animal waste)
- Petroleum products and solvents (Sources: home heating tanks or underground tanks, paint thinners)

- Chlorinated solvents (Sources: dry cleaning fluids, metal degreasers)
- Pesticides (Sources: lawn care/agricultural/forestry management chemicals)
- Inorganic contaminants (Sources: road salt, inorganic fertilizers)

Residential and commercial activities carried out near a well or wellfield or in a Wellfield Protected Area can directly influence the quality of drinking water for an entire community. Problems arise most often from chemicals that have been used, discarded, spilled or stored incorrectly within a wellfield area, in ways that adversely affect the groundwater.

Contamination Sources



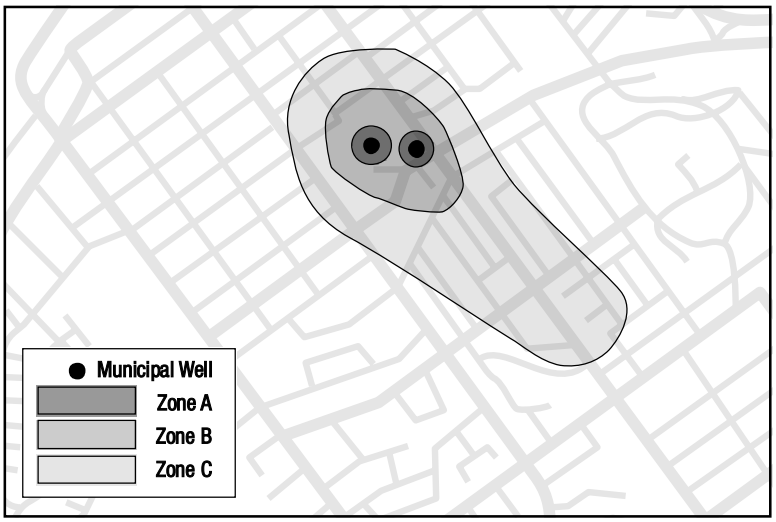
Consider these facts

- More than 150,000 New Brunswickers in over fifty municipalities rely on municipal wellfields that are fed by groundwater.
- **It costs much more – sometimes two hundred times more – to clean a contaminated municipal wellfield or to find an alternate water supply than to protect the well properly in the first place.**
- Some New Brunswick communities may not have an alternate water supply if their existing wellfield becomes contaminated.

How the Wellfield Protected Area Designation Order works

It makes far more sense to prevent water contamination in the first place, which is why the New Brunswick government developed the *Wellfield Protected Area Designation Order*. The goal of the Wellfield Protection Program is the identification and designation of **Zones**, which encompass the recharge area associated with and surrounding a wellfield. Each Wellfield Protected Area around a municipal well is divided into three smaller zones: Zone A, Zone B and Zone C. The zones reflect the fact that different contaminants persist in the environment for different time frames, move at different rates and pose different health risks.

Sample Illustration of a Wellfield Protected Area



Zone A is the closest to the wellhead and is therefore the most environmentally sensitive. Within this zone, the risk of contamination is greatest, and for protection, it is necessary to have in place the most stringent number of controls on chemical storage, development and other activities that might affect the municipal wellfield. The Designation Order states that septic tanks, sewer lines, petroleum products, chlorinated solvents, pesticides and similar chemicals or activities be controlled or in some cases, restricted within this zone. Potential bacterial contaminants such as manure or new septic tanks are more restricted in this zone.

Zone B lies more distant from the wellhead and surrounds Zone A. The risk of bacterial contamination from land use is greatly reduced in Zone B, but significant pollution risks still persist from petroleum products, chlorinated solvents and other persistent chemicals or activities.

Zone C surrounds Zones A and B and is located furthest from the wellhead. Controls on some chemicals or activities are much less stringent in Zone C but are still required for chlorinated solvents and petroleum products.

What is not allowed in a Wellfield Protected Area?

The following activities are prohibited in the protected area:

- Any activity that is not permitted by the Designation Order
- Use of a ground source heat pump
- New elevators that require the use of a liquid petroleum product

Activities Permitted in Zones A, B and C in a Wellfield Protected Area

The following Table 1 reflects the more common, permissible activities under the Designation Order. Please see the Designation Order for information regarding other uses, including: groundwater supply systems, electrical facilities, public utilities, and mineral exploration. In Table 1, "Minister" refers to the Minister of the Environment and Local Government.

If an activity is permitted by the Designation Order within the Wellfield Protected Area, it must be carried out in such a manner that it will not release contaminants into the groundwater or aquifer, or adversely affect public groundwater. It also must conform with all applicable federal, provincial and municipal statutes, regulations, orders and by-laws.

** **Note:** When reading the following Table, please bear in mind that every activity, thing or use that is permitted under this Schedule in a Zone A is permitted in a Zone B or a Zone C and every activity, thing or use that is permitted under this Schedule in a Zone B is permitted in a Zone C, unless otherwise indicated.

	ZONE(S)		
Permitted Activity	**Activities Permitted in Zone A** (see Section 5 of Designation Order)	**Activities Permitted in Zone B** (see Section 6 of Designation Order)	**Activities Permitted in Zone C** (see Section 7 of Designation Order)
Liquid Petroleum Storage (i.e. home heating oil, diesel, gas, kerosene, hydraulic fluid)	Can store liquid petroleum products up to a total of 25 L, excluding fuel contained in fuel tanks of motor vehicles. Can install one or more new liquid petroleum storage tanks up to a maximum capacity of 25L. Can use liquid petroleum that is stored on a parcel of land to provide heat or power to a building as long as the liquid petroleum is situated on the same parcel of land as the building.	Can store liquid petroleum products up to a total of 1200 L, excluding fuel contained in fuel tanks of motor vehicles, provided that the storage tanks possess a secondary system that contains the product without leaking if the original fuel tank fails and is acceptable to the Minister. Can repair or install new and existing liquid petroleum storage tanks up to a total maximum capacity of 1200 L, provided that all tanks possess a secondary containment system as described above. Can store up to 75 L of liquid petroleum product in new or existing single-walled containers.	Can store liquid petroleum products up to a maximum of 2000 L. Can install one or more new liquid petroleum storage tanks up to a maximum capacity of 2000 L.
Pesticides Storage and Application	Can store pesticides up to a total weight of 10 kg or total volume of 10 L, whichever is less. Can apply pesticides using manufacturer-recommended amounts and concentrations, provided that you (1) wash or dispose of pesticide containers	Can store pesticides up to a total of 15 kg or total volume of 15 L, whichever is less.	Can store pesticides up to a total weight of 50 kg or total volume of 50 L, whichever is less.

	ZONE(S)		
Permitted Activity	**Activities Permitted in Zone A** (see Section 5 of Designation Order)	**Activities Permitted in Zone B** (see Section 6 of Designation Order)	**Activities Permitted in Zone C** (see Section 7 of Designation Order)
Pesticides Storage and Application cont'd...	outside the Wellfield Protected Area (2) store and clean any pesticide application equipment outside Zone A (3) hold a certificate as required by the *Pesticides Control Act* if you are applying non-domestic pesticides as defined under that Act.		
Gardening and Fertilizers	Can do routine gardening and lawn maintenance, including compost for residential purposes. Can apply lawn fertilizers (other than animal manure) between April 1 and October 31, at a rate not exceeding 75 kg in total weight or 75 L in total volume, whichever is less, per hectare per year. Can store fertilizers (other than animal manure) up to 75 kg in total weight, or 75 L in total volume, whichever is less Can apply packaged/ manufactured/processed compost products that do not contain pathogens (disease causing organisms).	(Same as Activities Permitted in Zone A)	(Same as Activities Permitted in Zones A and B)
Other Chemicals	Can store or use chemicals referred to in Table 2 of this Guide, provided that you do not exceed the amounts stated under Zone A of that Table.	Can store or use chemicals referred to in Table 2 of this Guide, provided that you do not exceed the amounts stated under Zone B of that Table.	Can store or use chemicals referred to in Table 2 of this Guide, provided that you do not exceed the amounts stated under Zone C of that Table.

	ZONE(S)		
Permitted Activity	**Activities Permitted in Zone A** (see Section 5 of Designation Order)	**Activities Permitted in Zone B** (see Section 6 of Designation Order)	**Activities Permitted in Zone C** (see Section 7 of Designation Order)
Recreational Activities	Can carry out recreational activities. Can use, maintain and repair existing recreational facilities including swimming pools, parks, playgrounds, golf courses, ball fields, tennis courts, basketball courts, trails and skating rinks.	Can construct recreational facilities, except golf courses.	(Same as Activities Permitted in Zones A and B)
Agriculture	Can conduct existing agricultural activities including the use and renovation of farm buildings, provided that (1) surface waters continue to flow away from all wellheads in all zones (2) livestock are not grazed or stabled in Zone A (3) liquid or other dry manure or pathogen source composted products are not spread or stored in Zone A (4) roads constructed for agricultural purposes are properly ditched as to direct surface water away from all wellheads within the Wellfield Protected Area. May store or apply packaged/processed compost products that do not contain pathogens (disease causing organisms). Can possess and apply fertilizer for agricultural purposes according to an approved fertilizer management strategy by a registered agrologist.	Can conduct existing agricultural activities including the use and renovation of farm buildings, plus the storage and spreading of manure, provided that (1) grazing land is fenced to prevent livestock from entering in Zone A (2) fencing or some other suitable device is used to keep livestock at least 30m away from any surface water that flows from Zones B or C into Zone A (3) liquid or dry manure is stored in a clay-lined pit, a steel or concrete structure, or some other government-approved containment system (4) manure produced during agricultural operations is disposed of outside the Wellfield Protected Area if it is not spread in Zones B or C.	(Same as Activities Permitted in Zones A and B)

	ZONE(S)		
Permitted Activity	**Activities Permitted in Zone A** (see Section 5 of Designation Order)	**Activities Permitted in Zone B** (see Section 6 of Designation Order)	**Activities Permitted in Zone C** (see Section 7 of Designation Order)
Road Construction	Can use and maintain existing roads, provided that they are properly ditched to direct surface water away from all wellheads within the Wellfield Protected Area. Can store road salt up to a maximum of 50 kg.	Can construct, use and maintain new or existing roads, provided that they are properly ditched to direct surface water away from all wellheads within the Wellfield Protected Area.	(Same as Activities Permitted in Zones A and B)
Residential Buildings: Existing	Can use, renovate, maintain or rebuild a multiple or single-family house plus associated outbuildings when it is serviced by existing sanitary sewers. Can use, renovate or maintain any existing multiple or single family house with an on-site septic system that meets *Health Act* standards, provided that you do not increase the house's floor area; can also repair that septic system. If a house with an on-site septic system is irrevocably damaged, the house can be rebuilt, provided that the new home is not closer to a production well than the original house and that the only outbuilding is a garage. Can build a new multiple or single	(Same as Activities Permitted in Zone A)	(Same as Activities Permitted in Zones A and B)

	ZONE(S)		
Permitted Activity	**Activities Permitted in Zone A** (see Section 5 of Designation Order)	**Activities Permitted in Zone B** (see Section 6 of Designation Order)	**Activities Permitted in Zone C** (see Section 7 of Designation Order)
Residential Buildings: New	family house and outbuilding provided that it is serviced by existing sanitary sewers and that all other wastes are disposed of outside the Wellfield Protected Area.	Can build, use, renovate or maintain any existing multiple or single family house with an on-site septic system that meets *Health Act* standards, provided that you do not increase the house's floor area; can also repair the septic system.	(Same as Activities Permitted in Zones A and B)
Commercial, Institutional or Industrial Buildings	Can maintain or renovate existing commercial, Institutional or industrial buildings, provided that existing sanitary sewers service the buildings and that all other wastes are disposed outside the Wellfield Protected Area.	Can construct, maintain, or renovate new or existing commercial, institutional or industrial buildings, provided that sanitary sewers service the buildings and that all other wastes are disposed outside the Wellfield Protected Area.	Can construct, maintain or renovate new or existing commercial, institutional or industrial buildings, provided that (1) building is serviced by sanitary sewers or (2) building is serviced by an on-site septic system used by no more than 25 people per hectare of land that the building is serviced on, and (3) all other wastes are disposed outside the Wellfield Protected Area.

	ZONE(S)		
Permitted Activity	**Activities Permitted in Zone A** (see Section 5 of Designation Order)	**Activities Permitted in Zone B** (see Section 6 of Designation Order)	**Activities Permitted in Zone C** (see Section 7 of Designation Order)
Forestry	Can remove dead or blown-down trees from forested areas. Can cut trees in forested areas for the protection against insects or disease if approved by the Minister. Can cut down trees and other vegetation in non-forested areas.	Can cut down trees in forested areas, provided that (1) no more than 1/3 of the total trees on the property are cut down within any 10-year period (2) none of the resultant openings in the forest canopy are larger than 300 square metres (3) a well distributed stand of trees and other vegetation is maintained on the property. Can cut down trees in forested area if the Minister approves the activity.	(Same as Activities Permitted in Zones A and B)
Other	Can use or store propane gas. Can construct and repair a natural gas pipeline. Can use, maintain or repair an existing well.	Can drill, dig, use, maintain or repair a well.	(Same as Activities Permitted in Zones A and B)

Chemical Storage in a Wellfield Protected Area

In a wellfield protected area, the storage of certain chemicals are not permitted or are restricted in low quantities in order to protect the drinking water supply (see Table 2).

Table 2: Maximum Allowable Quantities of Chemicals (in Litres) Allowed per Property, According to Zone in a Wellfield Protected Area

Chemical Name	Common uses	Zone A (Litres)	Zone B (Litres)	Zone C (Litres)
Acetone	nail polish remover	10	15	100
Benzene	petroleum, varnishes	10	15	100
Bromoform	solvent for waxes, greases, and oils	10	15	100
Ethylene glycol	Antifreeze	5	50	100
Varsol	paint stripper	10	65	500
Methyl alcohol	windshield washer fluid	5	50	100
Toluene	paint, lacquer	10	15	50
Xylenes	Petroleum	10	15	50
Phenol	Disinfectants	0	0	0
Polychlorinated biphenyls (PCBs)	industrial use	0	0	0
Chloroform	solvent for adhesives, pesticides, fats, oils and rubbers	0	0	0
Chlorodibromomethane	small scale usage in laboratories	0	0	0
Dichloroethane	synthetic resins & rubber adhesives, rug and upholstery cleaners	0	0	0
Dichloromethane	paint strippers	0	0	0
Perchloroethylene	dry cleaning, brake cleaner	0	0	0
Trichloroethane	Aerosol paint concentrates	0	0	0
Trichloroethylene	solvent to remove grease from metal parts	0	0	0
All other chemicals not listed elsewhere in the Designation Order		20	50	100

Chemicals that are Denser than Water

Dense, non-aqueous phase liquids (DNAPLs) are chemicals that are denser (heavier) than water and cannot mix with water. Examples of DNAPLs are dry cleaning fluids, brake cleaners, and engine degreasers. Because DNAPLs are heavier than water, this enables them to migrate underground and sink to the base of an aquifer where they may be extremely difficult or even impossible to remove. These products are not permitted to be stored or used for any process or purpose associated with a commercial, institutional or industrial activity within a Wellfield Protected Area.

How do I know if I have some of these chemicals and what should I do if I have them?

Check the labels. If a product is flammable, corrosive or otherwise hazardous, it may contain chemicals that could contaminate a Wellfield Protected Area. If you use these chemicals, ask your retailer about alternatives that do not have harmful chemicals in them. Check with your Regional Solid Waste Commission to find out how you can safely dispose of chemicals. Many commissions offer Household Hazardous Waste Facilities to safely dispose of chemicals.

Temporary Passage

A person is allowed to pass through any zone of a Wellfield Protected Area while transporting chemicals that are prohibited in the zone, provided that: they enter and leave the zone within two hours, they are en route to a destination outside the zone, or they are making deliveries within the zone.

Common Questions

Am I Affected by the Wellfield Protected Area Designation Order?

To find out whether your home or business is in a Wellfield Protected Area, and how this will affect you, contact the Department of the Environment and Local Government (DELG) or the local Service New Brunswick registry office. Your property identification number will assist in this process. This number is located on your New Brunswick Property tax form. For more detailed information on vegetation control, pesticide use, petroleum and home heating oil storage tanks, fertilizers, livestock, manure storage, construction, and other activities in the three zones, contact the Water Planning Officer at your nearest DELG Regional Office.

How Will the Designation Order be Enforced?

Most New Brunswickers will voluntarily respect the *Wellfield Protected Area Designation Order*. The Department of the Environment and Local Government will designate municipal inspectors to complement the work of provincial inspectors to conduct audits and spot inspections. If convicted of Designation Order violations, individual offenders may be fined up to $50,000 and corporations up to $1,000,000 for each day that the violation continues.

For More Information

The *Wellfield Protected Area Designation Order* is for the benefit and well being of all members of the community. If you would like more information, please feel free to contact the Water Planning Officer at your nearest DELG Regional Office or:

The Sustainable Planning Branch
New Brunswick Department of the Environment and Local Government
P.O. Box 6000
Fredericton, New Brunswick
E3B 5H1

Telephone: (506) 457-4846 or 1-800-561-4036
Facsimile: (506) 457-7823
Information about the Wellfield Protection Program is also on the Web at: http://www.gnb.ca/0009/0371/0001/index.html

To contact your Regional Office of the Department of the Environment and Local Government, call:

BATHURST- Region 1
159 Main St., Suite 202
Bathurst, NB E3A 1A6
Tel : 547-2092

MIRAMICHI - Region 2
316 Dalton Avenue
Miramichi, NB E1V 3N9
Tel: 778-6032

MONCTON - Region 3
428 Collishaw Street
Moncton, NB E1C 3C7
Tel: 856-2374

SAINT JOHN - Region 4
8 Castle Street
Saint John, NB E2L 3B8
Tel: 658-2558

FREDERICTON - Region 5
565 Priestman Street, Suite 301
Priestman Centre
Fredericton, NB E3B 5X8
Tel: 444-5149

GRAND FALLS - Region 6
65 Broadway Blvd.
Grand Falls, NB E3Z 2J6
Tel: 473-7744

Michigan

WATER

- Biosolids & Industrial Pretreatment
- Drinking Water
  - Abandoned Water Wells
  - Community Water Supply
  - Contamination Investigation
  - Noncommunity Water Supply
  - Source Water Assessment
  - Water Wellhead Protection
  - Water Well Construction
- Emergency Response for Releases to Water
- Great Lakes
- Groundwater Discharge
- Groundwater Modeling
- Inland Lakes & Streams
- Mosquito Control Projects
- Surface Water
- Water and Wastewater Security
- Water Management
- Water Quality Monitoring
- Wetlands Protection

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What is an Abandoned Well?

The Groundwater Quality Control Act, Part 127, 1978 PA 368 defines an abandoned water well as a well which:

- has its use permanently discontinued.
- is in such disrepair that its continued use for obtaining groundwater is impractical.
- has been left uncompleted.
- is a threat to groundwater resources.
- is or may be a health or safety hazard.

Abandoned wells can be found almost anywhere: on farms, industrial sites, and in urban areas. Those marked by windmill towers and old hand pumps are easy to spot. However, many of them are hidden beneath weeds and brush or are buried below grade.

The following are examples of abandoned wells that must be plugged:

- Wells that are not operational.
- Wells that are disconnected and taken out of service at the time connection is made to a municipal water system.
- Any inoperable or abandoned well which is not properly sealed which can be a safety or environmental hazard.

Related Content

- Third Round AWM Grant - Interested Communities
- Well Abandonment Specifications
- CMI Abandoned Well Management (AWM) Grants Program Fact Sheet
- How to Plug an Abandoned Well
- Abandoned Wells in Michigan
- Abandoned Well Contamination Cases
- Abandoned Well Accidents
- How to locate an abandoned well?
- Abandoned Well FAQ

AN OVERVIEW OF MICHIGAN'S WELLHEAD PROTECTION PROGRAM

Michigan Department of Environmental Quality (MDEQ)

History of Wellhead Protection

The purpose of Michigan's Wellhead Protection Program (**WHPP**) is to protect public water supply systems (**PWSS**), which use ground water, from potential sources of contamination. Protection is provided by identifying the area which contributes ground water to PWSS wells, identifying sources of contamination within the area, and developing methods to cooperatively manage the area and minimize the threat to the PWSS.

Michigan's WHPP was developed in response to 1986 amendments to the federal Safe Drinking Water Act (**SDWA**). Unlike many programs throughout the country, wellhead protection is a voluntary program which is implemented on a local level through the coordination of activities by local, county, regional, and state agencies. Guidelines for the program were developed jointly by the MDEQ. Although the program is voluntary, PWSSs who choose to participate in wellhead protection must develop a local WHPP consistent with the guidelines established by the state. Local WHPPs must specifically address seven elements which include the establishment of roles and duties, wellhead protection area (**WHPA**) delineation, identification of sources of contamination within the WHPA, the development of mechanisms to manage the WHPA and minimize threats to the PWSS, the development of contingency plans for water supply emergencies, identification of procedures for the development of new well sites and incorporate them into the local WHPP, and provide opportunities for public participation. Various state and local regulations are integrated into the local WHPP and provide legal authority for a broad range of activities which help to support local wellhead protection efforts.

Funding for WHPP is available through a grant program designed to assist PWSSs in the development and implementation of WHPPs. The program is a 50% grant program which must be matched with 50% local funds. Grant money will be awarded to PWSSs based on a scoring system as outlined in the Grant Application.

Roles and Responsibilities

This element is designed to identify individuals responsible for development and implementation of the local WHPP. While one individual is generally identified as the primary contact for the local WHPP, the establishment of roles and responsibilities frequently requires the building of partnerships within the community and the participation of many individuals. Since ground water knows no political boundaries, partnerships may be developed between local, township, county, regional, and state agencies, and organizations to facilitate the effective management of the WHPA. In an effort to develop effective partnerships, local teams may be developed which include managers at the local level (city manager, utilities superintendent, city engineer, fire chief, building inspectors, etc.), county and state agency representatives, local watershed councils, and representatives from the general public. The team can serve to provide consistency in the local WHPP as new parts of the program are addressed or team members leave. Building a team to oversee the wellhead protection process helps to ensure a continuance of the program in future years.

Wellhead Protection Area Delineation

The federal SDWA defines a wellhead protection area as "... the surface and subsurface area surrounding a water well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field." In simpler terms, it is that area which contributes ground water to a PWSS well. Michigan WHPP requires a hydrogeologic study to identify the contributing area. The area contributing ground water to a well may extend for miles; therefore, Michigan's WHPP is based upon a ground water time-of-travel (TOT) of 10 years. The 10 year TOT provides a reasonable length of time for responding to environmental problems within the WHPA while concurrently providing an area which can be reasonably managed.

Potential Sources of Contamination

Michigan's WHPP requires the identification of sources of contamination within the WHPA. As a minimum, known and potential sites of environmental contamination should be included on a contaminant inventory list. Known sites of environmental contamination may include leaking underground storage tanks, Superfund sites, 201 sites of Act 451, sites of environmental contamination, and oil and gas contamination sites. Known sites which represent a potential for contamination include registered underground storage tanks, hazardous waste generators and ground water discharges.

Land use associated with agricultural operations, commercial facilities, manufacturing and industrial facilities, institutional facilities, and utility companies may also be considered potential sources of contamination. Abandoned wells left improperly sealed provide a direct conduit into the ground water system through which contaminants may migrate and should be considered as potential sources of contamination. In order to effectively manage a WHPA and accomplish wellhead protection, it is essential that threats to the PWSS are known.

Wellhead Protection Area Management

The goal of WHPA management is to provide mechanisms which will prevent existing and potential sources of contamination from reaching the public water supply well or well field. Communities are encouraged to develop management strategies which may be unique to their situation and specific to the contaminant source inventory developed for the WHPA. Management approaches may entail a broad range of activities including facility inspections, land-use regulations, operational policies, best management practices, public information and education. Management strategies should serve to generate support and attention to the WHPA for local, county, state, and federal regulatory activities. The strategies should attempt to minimize (eliminate if possible) land use activities which pose a significant threat to the PWSS, motivate landowners within the WHPA to take appropriate steps to reduce threats to the PWSS, and provide education to residents, businesses, and industries located within the WHPA to emphasize their role in making wellhead protection work.

An important aspect of wellhead protection is the general acceptance of the concept by community leaders and the development of land use and land protection measures which support wellhead protection. One means of providing for intelligent land use development is the incorporation of the wellhead protection concept and the WHPA into a community's Master Plan. Incorporation in the Master Plan aids community leaders in recognizing the extent of the WHPA and the need to set goals and objectives for community development which serve to protect the PWSS. This approach provides a mechanism for the effective use of local regulations in support of wellhead protection. Such support may come through the development of community wide zoning provisions, the development of a local site plan review process, or development of local standards for operation and maintenance of facilities located in the WHPA.

Contingency Plans

As part of the local WHPP it is important that the PWSS identify an effective contingency plan for water supply emergencies. The plan should identify personnel, testing equipment, and procedures and materials necessary for the fast and effective mitigation of water supply emergencies. A contingency plan should also include response protocol, notification procedures, and methods for handling emergencies based upon the nature of the threat to the PWSS. It is important that the contingency plan provide a course of action with an emphasis on providing a mechanism for chemical containment. The contingency plan should include the ability to provide an alternative water supply in the event that a PWSS well is impacted.

New Wells

Wellhead protection activities provide an excellent assessment of the PWSS by providing information on existing ground water availability, the ability of the PWSS to meet present demands, and the susceptibility of the existing wells to contamination. Where water supply expansion, increases in water use, or susceptibility of existing wells warrants future development of production facilities, a mechanism should be provided to incorporate the new facilities into the local WHPP. PWSSs which undergo expansion with the construction of new wells are strongly encouraged to adopt the wellhead protection concept. This is done because the WHPA delineation is easier (and cheaper) at the time of construction, wellhead protection can be used to evaluate the availability of the ground water resource at a site, and wellhead protection helps ensure that ground water resource development is occurring in an area which is not subject to contamination.

Public Education and Participation

Community involvement in the development and implementation of the local WHPP helps to ensure its success and longevity. While it is best if all citizens are provided an opportunity to participate, it is essential that individuals who live, work, and own businesses in the WHPA take an active interest in the program. To generate interest in wellhead protection, communities have focused on public education and the dissemination of wellhead protection information. Public education may be provided by presentations, at village/city/township meetings, before local boards and commissions, and at local schools. Information can be provided through wellhead protection newsletters and brochures, radio and cable television spots, and signs posted in WHPAs, etc.

Tritium Analysis

Tritium analysis may be used to estimate the time since recharge to the ground water system occurred and the susceptibility of the ground water system to contamination. Tritium concentrations in ground water provide a useful method for determining an aquifer’s degree of confinement. Tritium levels that are at or below one tritium unit indicate that the aquifer as “not vulnerable”.

DEQ

ROLES AND RESPONSIBILITIES FOR WELLHEAD PROTECTION

Guidance for Developing a Wellhead Protection Program Plan

Michigan Department of Environmental Quality

GOAL

The goal of this element is to identify individuals who will help develop and implement the local wellhead protection program and outline their responsibilities. This is generally accomplished by creating a local wellhead protection team and establishing the appropriate role and responsibilities for each team member. Given the dynamic nature of wellhead protection, it is important to acknowledge that roles and responsibilities will change over time and planning for this change is essential.

BACKGROUND

Establishing roles and responsibilities requires building partnerships within your community at all levels of government and with other supporting organizations. One person can often get the process started; however, to ensure long-term success of the program, others need to become involved to provide support. Support can be generated from people within your community and from agencies such as the state, the county health department, and local watershed councils. Together, this team can determine how to tailor a wellhead protection program to meet the needs of the community.

Throughout the process of program development and implementation, individual roles and responsibilities will change. Often, team members will change as new parts of the program are addressed and as people are promoted, elected, retire, or leave the community. This dynamic aspect of wellhead protection emphasizes the importance of a team approach. The team can provide consistency in the program and ensure its continuance over time.

POTENTIAL TEAM MEMBERS

Within a Community

Once members of a local government decide to pursue wellhead protection it is their responsibility to develop and implement a plan. A person at the local level must take the lead on the program (a responsibility that may be given to another as the program evolves), determine who needs to become involved and establish a funding source or financial strategy. The local government is also responsible for updating the program at least once every three years. People who are commonly involved in wellhead protection at the local level include:

- Village, city, or township manager
- Water plant superintendent
- Director of public utilities
- City engineer
- Fire chief
- Retired senior volunteers
- Business/Industry owners
- School teachers
- Students
- Home owners
- Village, city and township planning boards and commissions

At the State Level of Government

The state's responsibility to local governments is to provide technical assistance and guidance during program development and to review and approve programs which meet the state criteria. The state is also responsible for integrating wellhead protection with existing programs which may be modified to support the protection of ground water. For example, it has been proposed by the Department of Environmental Quality, Storage Tank Division, that all new underground storage tanks located within a wellhead protection area receive secondary containment. Many additional coordination efforts are currently underway to help local governments more effectively implement their programs. State departments which should be contacted in order to provide assistance include:

- Department of Environmental Quality
- Department of Natural Resources
- Department of Agriculture
- Department of Transportation

Please obtain the additional guidance materials for details on specific divisions within each department to contact for more information.

At the Regional Level

Regional agencies can provide a great deal of support to communities beginning wellhead protection. Most agencies have a working knowledge of existing land use and management in their area and are generally interested in providing support to help protect a drinking water supply. Agencies or organizations to consider contacting to support your local wellhead protection program include:

- Neighboring village, city, or township offices
- County health department
- Watershed council
- Groundwater Education in Michigan (GEM) Center
- Regional Council of Governments (SEMCOG, NEMCOG, NWMCOG)
- Natural Resources Conservation Service
- MSU Extension
- Resource Conservation and Development Council
- Universities
- Michigan Townships Association
- Michigan Society of Planning Officials
- Michigan Rural Water Association
- Michigan Section of the American Water Works Association
- Michigan Water Environment Association

At the Local Level

After reviewing this list, local agencies, organizations, or people may come to mind that should be included on the team. Most communities have interested citizens and unique individuals who have lived in the area for years and can contribute greatly to the success of the program. A local team should consist of not less than three people with representation by the public water supply superintendent, the municipality, and representation from at least one of the groups listed above.

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WHPA DELINEATION GUIDANCE

Overview of the WHPA Delineation Process

The State of Michigan, Wellhead Protection Program requirements for delineation of a Wellhead Protection Area (*WHPA)* necessitate completion of a hydrogeologic study. The hydrogeologic study includes an initial compiling of readily available information, the completion of fieldwork to obtain a better understanding of the hydrogeologic system, and groundwater modeling to identify the *WHPA*.

Readily available information may include water well records, aquifer test reports, hydrogeologic studies from local sites of environmental contamination, water-use records, geologic maps, topographic maps, and other related information. Sources of information include the Michigan Department of Environmental Quality, the Michigan Department of Natural Resources, local health departments, and public water supply system records. Additional investigation may be warranted to uncover potentially useful hydrogeologic information available as historical or archived records. Available information is normally sufficient to develop a rudimentary conceptualization of the hydrogeologic system and identify areas requiring additional acquisition of information and data.

Fieldwork is completed to fill voids in the available information, confirm or modify the rudimentary conceptualization, and provide the information base necessary for groundwater flow modeling to delineate the *WHPA*. The available information and information collected through fieldwork is used to develop a final conceptualization of the hydrogeologic system. The final hydrogeologic conceptualization is incorporated into a groundwater flow model that is used to identify the *WHPA*.

Field Work

Groundwater flow models require as input, at a minimum, an estimate of the following parameters: 1) aquifer transmissivity, 2) groundwater flow direction, 3) hydraulic gradient, 4) effective porosity, 5) pumping rates for all wells, and 6) aquifer thickness. The requirements for fieldwork are meant to provide an aquifer transmissivity, a groundwater flow direction, and the hydraulic gradient. These three parameters exert the greatest influence on the areal extent and configuration of the *WHPA*.

Aquifer Tests

An aquifer test provides a quantitative and qualitative evaluation of the water-yielding capacity and hydraulic properties of an aquifer. At a minimum, the test provides an estimate of the aquifer's transmissivity and storage coefficient. Transmissivity is a product of the aquifer material's hydraulic conductivity and the aquifer thickness, and provides a measure of how easily groundwater moves in the aquifer. The storage coefficient reflects the volume of water available in the aquifer. Together they influence the areal extent of the *WHPA* by defining the radius of influence of a well as a function of the pumping rate and the duration of pumping.

The aquifer test can also provide a useful characterization of the aquifer. When properly conducted and the data appropriately analyzed, information may be obtained on the aquifer conditions (i.e.- confined, leaky-confined, and unconfined). This qualitative characterization can be used to confirm area geology, aid in the conceptualization of the aquifer system, and provide insight relative to the vulnerability of the aquifer, which is useful in development of a groundwater flow model. Other quantitative information may be obtained from a properly conducted aquifer test such as the vertical hydraulic conductivity of an overlying confining unit, or the vertical component of hydraulic conductivity within an aquifer.

All aquifer tests completed as part of a wellhead protection area delineation must meet the requirements of the DEQ, Drinking Water and Radiological Protection Division, Policy Procedure DWRP-03-003, Subject: Aquifer Test Requirements for Public Water Supply Wells.

Groundwater Flow Direction, Hydraulic Gradient, and SWL Elevations

The single most important aspect of a *WHPA* delineation is determination of the groundwater flow direction and hydraulic gradient. These two parameters exert considerable influence on the upgradient shape and areal extent of the *WHPA*. Groundwater flow direction and hydraulic gradient are determined by the collection of static water level (SWL) elevations. Depending on the modeling approach, SWL elevations may be used to confirm groundwater flow direction and hydraulic gradient information, directly determine the groundwater flow direction and gradient, or as "calibration targets" in more complex groundwater modeling and groundwater flow simulation efforts.

To grasp the importance of SWL elevations, it is important to understand the concept of the "potentiometric surface." Groundwater moves from areas of high energy (high elevation) to areas of low energy (low elevation). A single static water elevation reflects the energy of the groundwater at a specific location in the groundwater system. Multiple SWL elevations reflect the energy at multiple locations and may be used to develop a potentiometric surface. Once developed, the potentiometric surface depicts, in two dimensions, the spatial distribution of energy within the groundwater system. The direction of maximum change in the potentiometric surface defines the groundwater flow direction, and the magnitude of the change defines the hydraulic gradient.

Because SWL elevations in groundwater systems may vary little over long distances, it is important that SWL elevations be obtained while maintaining good vertical control. Static water level elevations must be provided relative to the National Geodetic Vertical Datum of 1929, or the North American Vertical Datum of 1988. All SWL elevations must be determined by surveying relative to a known vertical control point, such as a survey "benchmark," and determined to an accuracy of 0.01 feet.

Delineation Approaches

There are three widely accepted approaches for delineation of a *WHPA*. The three approaches reflect an increase in the amount of fieldwork, an increase in the level of complexity of the groundwater flow model, or both. For the purpose of discussion the approaches will be referred to as follows:

1. Confirmation of Existing Information,
2. Direct Determination of Groundwater Flow Direction and Hydraulic Gradient,
3. Extensive Hydrogeologic Investigations.

A common denominator to the three approaches is the use of "reverse particle tracking" to identify the *WHPA*. Particle tracking may be described as "tracing the movement of an imaginary groundwater particle on the groundwater potentiometric surface." Thus, particle tracking identifies the path which groundwater takes in moving from areas of high energy to areas of low energy. In *WHPA* delineations it is more practical to perform the tracing of groundwater movement in reverse, or reverse particle tracking. Reverse particle tracking traces the movement of groundwater from areas of low energy to areas of high energy (i.e.- from the pumping well back to the area of recharge). Reverse particle tracking eliminates the "trial-and-error" associated with forward particle tracking by eliminating areas of the potentiometric surface from which groundwater would not migrate to the well.

With any of these three delineation approaches, there must be an appropriate aquifer test conducted for the water supply well. If there is not a test which meets the requirements of the DEQ, Drinking Water and Radiological Protection Division, *Policy Procedure DWRP-03-003, Subject: Aquifer Test Requirements for Public Water Supply Wells*, an appropriate aquifer test will need to be performed.

Delineations that Confirm Existing Information

A delineation that confirms existing information is the least expensive. In this approach, an estimate of the groundwater potentiometric surface is obtained. The potentiometric surface is than confirmed by measurement of a minimal number of SWL elevations.

First, well log information is utilized to construct cross-sections representative of the local geology and to identify the discrete aquifer units present in the area. The well logs are further inspected to identify water wells that are completed in the same aquifer as the public water supply wells. The locations of an adequate number (approximately 15 or greater) of water wells completed in the same aquifer are identified on a map in a manner to provide a distribution of wells in the area surrounding a public water supply well. Where a water well in the same aquifer has been located, an estimate of the land surface elevation is made from topographic maps and other elevation data. Water level data, which is generally reported on well logs as a depth below the land surface, is obtained. The estimate of the land surface elevation and the depth of the groundwater below the land surface reported on the well log are used to estimate the SWL elevation at individual well locations. Collectively, the estimated SWL elevations from the multiple well locations are than used to develop a potentiometric surface map of the groundwater system.

It should be apparent from the preceding discussion that, in this approach, the potentiometric surface map is developed from existing well log and topographic information. This information is often of poor quality, insufficient in both spatial and vertical control to provide a true and accurate representation of the potentiometric surface. Error is introduced because of a lack of resolution in the estimate of land surface elevations, or because the water level information is inaccurate (plus or minus 5 feet). Also, seasonal differences relative to the time of well construction when the information was recorded can impart error to the water level information. As a result, the potentiometric surface developed from existing well log and topographic information must be confirmed. Confirmation is provided by the determination of SWL elevations in a minimal number of water wells (~4-6) completed in the same aquifer. If the SWL elevations confirm the potentiometric surface, a simple groundwater flow model is constructed and reverse particle tracking is completed to identify the *WHPA.*

Direct Determination of GW Flow Direction and Hydraulic Gradient

Delineations that involve direct determination of the groundwater flow direction and hydraulic gradient place a much greater emphasis on fieldwork. In this approach considerable emphasis is placed on fieldwork to provide a greater number of actual SWL elevation measurements for development of the potentiometric surface.

As in the previous approach, well logs are screened to identify an adequate number of water wells (approximately 15 or more) completed in the same aquifer as the public water supply wells. The locations of selected water wells are placed on a map in a manner to provide a distribution of wells in the area surrounding a public water supply well. It is important that an emphasis be place on wells in the area projected as upgradient of the public water supply well. As in the previous approach, the wells are utilized in the development of cross-sections to characterize the area geology. The selected wells are then further screened to identify the wells from which a SWL measurement can be easily obtained. This generally involves the elimination of wells equipped with a shallow or deep well jet, and small diameter wells. An emphasis is placed on locating wells 4-inches in diameter or greater, as they provide the easiest access. An elevation for the top of casing on selected wells is obtained by surveying, and the SWL in all wells is the measured distance below the top of casing. The SWL elevation of the groundwater is then determined as the difference between the top of casing elevation and the distance to the SWL. The process provides actual SWL elevations from multiple well locations, which are than used to develop a potentiometric surface map of the groundwater system. As in the previous approach, a simple groundwater flow model is used in conjunction with reverse particle tracking to identify the *WHPA.*

Complex Hydrogeologic Investigations

Delineations may also be obtained by conducting a complex hydrogeologic investigation, which is by far the most expensive approach. This approach includes extensive compiling of existing information and a preliminary characterization of the hydrogeologic system. Information sources may include water well records, aquifer test reports, hydrogeologic studies from local sites of environmental contamination, water-use records, geologic maps, topographic maps, stream flow data, rainfall data, and other available hydrologic information. Fieldwork is then directed at addressing inconsistencies in the available information or providing more detailed information in areas where the available information is limited. The fieldwork may include geologic borings, installation of observation or monitoring wells, determination of SWL elevations, aquifer tests, geophysical tests and isotope analysis. The combined set of existing information and newly acquired data is used to develop a conceptual model of the groundwater system that is reproduced mathematically as a groundwater flow model.

The mathematical duplication of the conceptual model may be completed using a sophisticated analytical groundwater model program or a numerical groundwater model program. The model programs are used to develop a mathematical representation of the groundwater flow system that can mimic the movement of groundwater in the hydrogeologic system. The mathematical representation in its simplest form depicts the hydrologic system in 2 dimensions incorporating boundary conditions and aquifer hydraulic characteristics (transmissivity, hydraulic conductivity, and aquifer thickness). Other hydrogeologic features, which may control the movement of groundwater, are frequently incorporated into the model. These features can include the effect of pumping wells, "positive" boundaries (i.e.- lakes, streams and rivers), negative boundaries (i.e.- presence of impermeable materials, pinching out of the aquifer), recharge to the groundwater system, and evapotranspiration. Depending upon the degree of complexity in the groundwater system, the vertical movement of groundwater may be incorporated into the model resulting in a model that is 3-dimensional. The vertical movement of groundwater may be necessary to simulate the movement of groundwater between aquifers or the dewatering of an unconfined aquifer.

Once the conceptual model has been mathematically duplicated, the mathematical model is used to simulate the movement of groundwater in the groundwater system. Output from the simulation includes, at a minimum, potentiometric surface information that defines how groundwater moves in the hydrogeologic system, and information on the distribution of groundwater discharges in the system. The output from the simulation is compared, or calibrated, against known SWL elevations and discharge information to determine a "goodness of fit." A close match between the observed information and simulation output indicates the model provides an accurate mathematical representation of the groundwater flow system. The model may than be used to evaluate different resource development scenarios and identify the wellhead protection area. As with the previous approaches, reverse particle tracking is used to identify the *WHPA*.

Summary of Delineation Approaches

Regardless of the approach that is used, simplifying assumptions relative to the hydrogeologic system must be made to complete a *WHPA* delineation. In the succession of approaches discussed above, the accumulation of additional reliable information results in a successive reduction in the potential impact of the simplifying assumptions. Generally, the simplifying assumptions are handled in a manner so as to insure a "conservative" delineation of the *WHPA*.

Delineations based on existing information are characterized by an emphasis on available data and a minimal amount of fieldwork. The direct determination of the groundwater flow direction and hydraulic gradient also relies on existing data, although much greater emphasis is placed on the acquisition of SWL elevation data and the development of the potentiometric surface. Both approaches are characterized by the use of elementary groundwater flow models. The models are analytical solutions to a complex problem that describe the groundwater system in two dimensions. Although highly recommended and appropriate for the delineation of a *WHPA*, a clear understanding of the assumptions and limitations of the two approaches is essential. The two

approaches tend to provide a delineation which, although frequently accurate, may provide a conservative over-estimate of the "actual" *WHPA*. This means that the *WHPA* area may be larger than it needs to be, making management of the area a more difficult task.

Complex hydrogeologic studies necessitate the acquisition of more specific information. The approach entails the use of sophisticated groundwater flow models that allow for the incorporation of many more hydrogeologic subtleties. The approach tends to rely to a lesser extent on coarse simplifying assumptions resulting in a groundwater flow model that better mimics the hydrogeologic system. As a result, the complex approach frequently provides a more concise, smaller, and defensible *WHPA*. The groundwater flow model that is developed may also be useful in assessing various groundwater resource development scenarios for which the previous approaches are not amenable. Unfortunately, this approach requires a much greater investment of time and resources to complete the delineation.

Selecting a Delineation Approach

Delineations based on existing information may be performed for as little as $15,000, while complex hydrogeologic studies can cost in excess of $100,000. The cost is highly dependent on the number of municipal wells and the hydrogeologic complexity of the groundwater system. A community must weigh the options relative to their goals, economics, and long-term planning objectives related to the local wellhead protection program to evaluate which delineation approach is most appropriate. The delineation approach should meet the wellhead protection goals and objectives of the community.

An important factor to remember when applying any delineation approach is that the *WHPA* may change with time. The *WHPA* must be reevaluated as changes in the community alter the operational parameters of the public water supply system. Changes in the public water supply system such as the construction of a new well, an increase in the rate of groundwater withdrawal, or shifts in pumpage from one well field to another are actions that would necessitate a reassessment of the *WHPA*.

Summary of Groundwater Flow Model Programs

Following are examples of groundwater flow model programs that may be used to complete a *WHPA* delineation. The list is not all-inclusive and other model codes are available that may be appropriate. The list is provided to emphasize the diversity of model codes available.

MODEL **TYPE: ANALYTICAL, ANALYTIC ELEMENT OR NUMERICAL**

WHPA ***Analytical (2-dimensional)***
Developed by the U.S. EPA, Office of Groundwater Protection. An integrated program of analytical and semi-analytical solutions to the groundwater flow equation coupled with particle tracking. Very easy to use, although limited in the scope of information it accepts and ability to simulate hydrogeologic complexities. Semi-analytical GPTRAC Numeric option has been widely used for delineation of *WHPA*s.

CAPZONE/GWPATH ***Analytical (2-dimensional)***
An analytical flow model for simulating confined, leaky confined or unconfined flow to wells with superposition of regional water levels and particle tracking. Requires interface with SURFER, a computer contouring program. Able to incorporate some hydrogeologic complexities but restricted by limiting assumptions incorporated into methodology. Provides model head output that allows for "calibration" of the model.

QUICK FLOW ***Analytic Element (2-dimensional)***
An interactive analytical element model that simulates 2-dimensional steady-state and transient groundwater flow. Steady-state model simulates flow in horizontal plane using analytical functions. Model generates streamlines, particle traces and head contours. Easy to use, menu driven, able to incorporate some hydrogeologic complexities, but restricted by limiting assumptions incorporated into the methodology.

WINFLOW ***Analytic Element (2-dimensional)***
This program was developed by the same author as ***QUICK FLOW.*** This model is an enhanced, Windows-based, version of ***QUICK FLOW.***

GFLOW ***Analytic Element (2-dimensional)***
A flexible model used to simulate regional flow systems. Able to incorporate wells, area inhomogeneities, and some hydrogeologic complexities which can account for the vertical movement of water through localized interconnections (infiltration/discharge from lakes, drains and rivers). A flexible model incorporating greater field diversities by virtue of the analytic element method. Modeled head output and limited discharge information is obtained for "calibration" of the model.

CZAEM ***Analytic Element (2-dimensional)***
Developed by the U.S. EPA. Similar in application to GFLOW, although unable to incorporate the full range of hydrogeologic complexities. Designed for elementary capture zone analysis.

WhAEM ***Analytical (2-dimensional)***
Developed by Indiana University for the U.S. EPA, Office of Groundwater Protection. Includes an analytic element model that superposes many analytic solutions to generate a solution to the groundwater flow equation. The model uses two programs, a preprocessor GAEP and the flow model CZAEM. The model is easy to use, and can handle fairly realistic boundary conditions such as streams, lakes and aquifer recharge due to precipitation unlike most analytical models.

MODFLOW ***Numerical (2- or 3-dimensional)***
Finite difference model for the simulation of two-dimensional, quasi-3-dimensional or fully 3-dimensional steady-state and transient groundwater flow. Model incorporates virtually all hydrologic complexities including wells, recharge, evapotranspiration and movement of groundwater into and out of drains, rivers and lakes. A complex groundwater flow model that was previously difficult to use. Various pre- and post processors are now available. Most widely used numerical model, well documented for modeling simple or complex hydrogeologic settings. Provides model head and discharge as output for calibration of the model.

Suggested Questions

Hydrogeologic studies involve special knowledge, skills, and services that often necessitate the assistance of a consulting firm. It is important that the consultant have experience providing services in the area of hydrogeologic investigations and/or water supply development. A list of general questions which you may ask, of yourself or a potential consultant, include the following:

1) What experience does the consultant or investigator (if not a consulting firm) have in performing *WHPA* delineation?

2) What is to be accomplished by the *WHPA* delineation?

3) What is the minimum amount of data required to obtain a reasonably accurate delineation?

4) Are there additional information sources that would be beneficial? If yes, how costly is it to obtain this information?

5) How does the consultant intend to obtain the required information to be used as input to the model?

6) Can any part of the data collection process be conducted and maintained "in house" by city/township/village staff?

7) Can the consultant provide a work plan describing the various tasks that need to be completed and the time and cost required to complete each task?

8) Will the consultant need to obtain the services of a licensed water well driller?

9) Who will obtain access to existing water wells? What precautions need to be taken to protect these wells? Who is responsible for any problems that arise?

10) What groundwater flow model will be used and why? Does the chosen model have particular strengths applicable to your specific geologic setting?

11) Are there other advantages or disadvantages to using the selected model?

12) Can a similar answer be obtained with other models that are less complex and require less input information?

13) Is the groundwater model easily updated? How much will it cost to maintain or update the model? How often will it need to be updated?

DEQ

WELLHEAD PROTECTION AREA MANAGEMENT

Guidance for Developing a Wellhead Protection Program Plan

Michigan Department of Environmental Quality

GOAL

The goal of the management plan is to specify how actual and potential sources of contamination in a wellhead protection area (WHPA) will be managed in order to prevent them from reaching the aquifer. Each community may custom design a plan and select the control measures which are most appropriate for their plan. Management approaches may involve a variety of activities including facility inspections, land-use regulations, operational policies, best management practices, public information, and education.

To help communities attain this goal, wellhead protection areas will be considered as special management areas by many supporting organizations. The state, for example, will give special attention to facilities and properties within a wellhead protection area when conducting underground storage tank inspections, granting ground water discharge permits or inspecting hazardous waste sites. Other agencies such as county health departments and watershed councils may offer similar support once involved in a local wellhead protection program.

WHPA MANAGEMENT PROGRAM OBJECTIVES

- To have the appropriate land use planning and management mechanisms in place to prevent contamination of the public water supply system.
- To generate support and direct appropriate attention, inspections, and regulatory activities to the WHPA for management by local, county, state, and federal government agencies.
- To identify and minimize or eliminate land use activities which pose significant threats to ground water.
- To identify and utilize available local resources, including volunteer and staff resources, to address needs for wellhead protection area management.
- To motivate landowners within the wellhead protection area to take steps to reduce threats to ground water.
- To educate residents, business and industry on the importance of wellhead protection and the need for them to do their part to protect the public water supply system.
- Evaluate ways to direct new growth or redevelopment that supports wellhead protection. Sewer and water extensions, roads, and other infrastructure should be considered in the planning process.
- Require best management practices within the wellhead protection area including secondary containment for hazardous substance storage, proper floor drain connections, construction of grassed swales for onsite storm water management and sealing of abandoned wells.

WHPA MANAGEMENT PROGRAM OPTIONS FOR CONSIDERATION

Intergovernmental Coordination Options:

Communication with adjacent units of government on an ongoing basis is essential for management of the wellhead protection area especially since delineations often cross many jurisdictional boundaries. If the adjacent community has land within the wellhead protection area, establish an ongoing mechanism for communication such as: 1) joint city/township meetings of planning commissioners; 2) joint education programs related to methods for ground water protection; 3) adoption of similar ground water protection site plan review standards for all jurisdictions; 4) information exchange on development plans. Other intergovernmental coordination options to consider include:

- Modify and use the state/county environmental permits checklist for your community. Distribute the checklist to persons considering business operation or land purchase within the wellhead protection area.
- Notify federal, state, county, and local regulatory offices about WHPP goals and the location of the WHPA.
- Consider partnership agreements among agencies to formalize the exchange of information and services.

Public Awareness and Education Options:

- Post "wellhead protection area" signs at the edge of the wellhead protection area.
- Post ?drains to drinking water recharge area ? signs at storm drain openings if drains discharge to the WHPA.
- Publicize the program through: local newspaper, community newsletter; municipal, and/or public access cable television; posters; library displays; school programs, etc.
- Carry out hazardous material surveys through the Firefighter Right-to-Know program.
- Provide technical assistance to agricultural landowners (Farm-a-Syst for ground water protection).

- Conduct homeowner surveys on septic system maintenance, lawn care practices, etc., which can be followed-up with an informational brochure promoting ?safe ? home and lawn care practices to home owners.

- Establish household hazardous waste collection programs, with special notice to residents within the WHPA.
- Organize a coalition of business owners to review options for pickups of small quantity hazardous waste; sponsor open house for businesses; honor businesses that demonstrate waste reduction initiatives.

Technical Assistance Regulatory Options:

- Develop community wide zoning provisions for ground water protection (site plan review standards).
- Target inspections by fire chiefs to facilities within the WHPA, which may have hazardous substances on site.
- Develop locally-based regulatory and incentives program for site cleanup.
- Require, through local zoning ordinance, additional information about hazardous substance and onsite management practices when new development is proposed within the wellhead protection area.

Land Protection and Land Use Planning Options

One of the major recommendations when developing a wellhead protection area management plan is to **i**ncorporate the boundaries of the wellhead protection area into the local Master Plan. Incorporation of wellhead protection area boundaries will help community leaders recognize the extent of this area and the need to determine what goals and objectives should be included as part of their Master Plan which will serve to protect their drinking water supply. This will emphasize the importance of wellhead protection and provide consistency in the program as community leaders change.

Other land protection and land use planning options include:

- Purchase of land by government agencies
- Purchase of conservation easements by government agencies.
- Obtain donations of development rights by landowners.
- Advance purchase of lands for new well fields preferably in locations separate from current well fields.
- Transfer of development rights initiatives (new legal options may be proposed through Michigan legislation).

DEQ

PUBLIC PARTICIPATION FOR WELLHEAD PROTECTION

Guidance for Developing a Wellhead Protection Program Plan

Michigan Department of Environmental Quality

GOAL

The goal of this element is to actively involve people who live and conduct business in the wellhead protection area in the development and implementation of the program. Local wellhead protection programs must ensure that public participation takes place by incorporating processes for involvement in each of the program elements. The involvement of citizens, both in the development and implementation of a wellhead protection program, will improve the quality of the program and help to guarantee its success.

BACKGROUND

It is a common belief that in order for a wellhead protection program to be effective, everyone within the community and generally the neighboring jurisdiction has to do their part. To generate interest and initiate participation, communities have focused on public education, information, and participation. Listed below are a number of options to consider when beginning a wellhead protection program.

PUBLIC EDUCATION/INFORMATION/PARTICIPATION OPTIONS FOR CONSIDERATION

- Village/city /township meetings
- Planning board or commission meetings
- Newsletters
- Newspaper articles
- Radio spots
- Local cable television spots
- Presentations at elementary and secondary schools
- Presentations at rotary or other local organization club meetings
- Wellhead protection brochures
- Water plant tours
- Elementary/secondary school study units which introduce wellhead protection concepts or activities
- Children's water festivals
- Waste reduction strategies targeted for wellhead protection areas
- Wellhead protection ordinances or policies
- Wellhead protection information for distribution in the monthly water bill
- Wellhead protection area signs on roads which enter the wellhead protection area
- Frequent household hazardous waste collection days for residents in the wellhead protection area

Involving the public is one of the most important elements to a successful program. Wellhead protection cannot be completed without establishing strong partnerships and cooperation throughout the community.

DEQ

NEW WELLS

Guidance for Developing a Wellhead Protection Program Plan

Michigan Department of Environmental Quality

GOAL

Where water supply expansion, increases in water use, or susceptibility of existing wells or well fields to contamination may necessitate the future development of new production facilities, a mechanism for incorporating new wells or well fields into the local wellhead protection program should be provided.

NEW WELLS AND WELLHEAD PROTECTION

Public water supply systems expanding with the construction of new wells are encouraged to implement a local wellhead protection program for the new wells. There are many reasons to support the concept of wellhead protection at the time of construction. Primary among them is the fact that the wellhead protection area delineation is accomplished much easier and at considerably less cost since much of the hydrogeological work required of a delineation is also required in the resource assessment to determine the availability of ground water at a site. Another reason for this approach is to verify that the water supply development is occurring in an area where it will not be subject to contamination. This is critical to the concept of furthering public health and protecting the investment which a public water supply system makes in developing a ground water resource.

WATER SUPPLY ASSESSMENT

The wellhead protection area delineation activities result in a thorough hydrogeological assessment of existing wells or well fields. This should result in a better understanding of the existing ground water availability and the ability of the public water supply system to meet present demands for water. However, the delineation activities may indicate that the community should seek the development of new facilities at an alternative site. This may be due to identification of problems such as knowledge that a well or well field appears to be "at risk" due to existing sources of contamination within the wellhead protection area. Information with regard to projected future water use may also result in a desire by the community to develop an additional well or well field. In either instance, the delineation activities can be used to identify more favorable locations for further development of the ground water resource. Conversely, the evaluation of the public water supply system resulting from wellhead protection efforts may result in the conclusion that additional development of the ground water resource is not necessary.

ARE NEW WELLS NECESSARY

Knowledge of the public water supply system demands, current capacity, and the community's projected growth are essential in determining the need for a new well or well field. Information of concern and questions which should be asked in making a decision with regard to planning (or not planning) for new wells includes:

- The location and capacity of all PWSS wells or well fields;
- How does current capacity compare to the current use?
- Is community development and expansion expected?
- Do commercial or industrial facilities located in the community require more water?
- Can enhancement of the system capacity attract new business or industry.
- Will the public water supply system have to be expanded to meet future demands?
- What, if any, contamination sources have been identified in the wellhead protection area?
- Can the contamination sources in the wellhead protection area be considered "potential" sources requiring management efforts to control them?
- Are there "existing" sources of contamination in the wellhead protection area that may impact public water supply system wells in the future?
- Based upon the wellhead protection area delineation, can areas be identified which appear isolated from present contamination problems?

Answering the above or similar questions should allow you to draw conclusions about the need for further ground water resource development and the construction of new wells. If new wells are anticipated a brief description of how the new wells will be incorporated into the local wellhead protection program should be provided.

DEQ

CONTINGENCY PLANS

Guidance for Developing a Wellhead Protection Program Plan

Michigan Department of Environmental Quality

GOAL

The goal of a contingency plan should be the immediate and long-term protection of a public water supply system (PWSS) by identification of personnel, testing equipment, procedures, and materials which can be used for the rapid correction or mitigation of environmental accidents which might constitute a water supply emergency. A contingency plan should also include response protocol, notification procedures and methods of containment. Accidents which might directly impact the PWSS need to be addressed with methods for isolating portions of the PWSS and/or providing water from an alternative source.

WATER SUPPLY EMERGENCIES

A water supply emergency may range in severity from a power outage to the effects of a widespread natural disaster. For the purposes of wellhead protection, the most probable threat to a PWSS requiring an emergency response will be from a hazardous substance spill within the wellhead protection area. Such a spill may occur at a fixed location involving the handling or storage of chemicals or in association with a transportation related accident.

WATER SUPPLY INFORMATION

A comprehensive knowledge of the PWSS controls is critical in the case of a water supply emergency. Essential information which should be made available to an emergency response team includes:

- Location and capacity of all PWSS wells and storage tanks;
- Location and size of all major distribution lines (Distribution Map);
- Critical locations of isolating valves for the distribution system;
- The options available for providing an alternative water supply;
- If applicable, location and capacity of PWSS treatment facilities.

ALTERNATIVE WATER SUPPLY OPTIONS

The logistics of providing water from an alternative source is an essential component of the contingency plan. In the case of a water supply emergency, the PWSS must have identified methods for rapidly providing uncontaminated water to any portion of the distribution system. Generally, there are four means of addressing a water supply emergency and/or providing water from an alternative source. The alternatives which should be considered are:

Reduction of Water Use

Where additional capacity is not available, restricting water use may be a viable alternative. However, application of this approach requires an effective means of communicating the problem to the PWSS users and obtaining a voluntary reduction in water use.

Supply from Within the System

An alternative water source may be available within the system through isolation of the affected area and providing water from wells and/or portions of the distribution system unaffected by the water supply emergency. This option requires the a priori development of additional capacity generally at a different location.

Well Field Management

The select pumping of preferred wells or the pumping of contaminated wells to prevent impact to other clean wells may be used as a short-term measure. Water from contaminated wells may also be "blended" with uncontaminated well water to obtain contaminant levels which represent an acceptable risk.

Water from Outside the System

Supply from outside the PWSS is another option for providing an alternative water source. This is generally accomplished by connection to an adjacent PWSS.

Treatment

A method may be made available to provide treatment to the affected source water by removing contaminants to an acceptable level.

CONTENTS OF THE CONTIGENCY PLAN

Response to a water supply emergency will generally involve the coordinated efforts on the part of a number of citizen and regulatory groups. The plan should identify the following:

- Name of person(s) responsible for directing public safety;
- Name of person(s) responsible for the environmental response activities;
- Listing of emergency response personnel and their telephone numbers (also posted on premises);
- Identification of the MDEQ, Drinking Water & Radiological Protection Division contact;
- Facility specific information on the hazardous material stored or transported in the wellhead protection area;
- An example emergency notification report form (see below).

Sample Form

Part A. Facts Related to the Emergency

1. Person calling in emergency: _____
2. Date/time call made: _____
3. Location and address of emergency: _____
4. Nature of emergency (e.g., broken water main; chemical spill; lost pressure; etc.): _____
5. Condition at scene: _____
6. Types/quantities of chemicals released, based on initial observation: _____

Part B. Emergency Action Taken

1. Emergency action taken: _____
2. Is immediate action: Permanent _____ Temporary _____
3. Additional action needed to bring water supply system back into operation: _____

Part C. Persons/departments notified of emergency

Position/agency	Name	Phone	Time
- State Fire Marshal			
- County Sheriff			
- State Police			
- Local police (911)			
- PWSS superintendent			
- Local elected official			
- Drinking Water & Radiological Protection Division MI Dept. of Environmental Quality			
- Environmental Response Division, MI Dept. of Environmental Quality			
- Pollution Emergency Alert System (PEAS) MI Dept. of Environmental Quality		1-(800)-292-4706	
- Agriculture Pollution Emergency Hot Line MI Dept. of Agriculture		1-(800)-405-0101	
- Chemical spill cleanup company			
- Other personnel			

DEQ

POTENTIAL SOURCES OF CONTAMINATION

Guidance for Developing a Wellhead Protection Program Plan

Michigan Department of Environmental Quality

GOAL

The goal of the contaminant source inventory is to identify existing and potential sources of contamination within the wellhead protection area which might represent a "threat" to the public water supply system (PWSS). A comprehensive knowledge of these "threats" is essential in the development and implementation of effective management and public education strategies within the local wellhead protection program. As a minimum, a local wellhead protection program plan should include a verified list of known sites of environmental contamination and known potential sources of contamination. The program plan should then identify a process for the identification of any remaining potential sources of contamination which lie within the wellhead protection area.

EXISTING SOURCES OF CONTAMINATION

When possible, the agency will provide information regarding existing potential sources of contamination, including known and potential sites of environmental contamination identified in various state programs. This information may include:

- Part 201 of Act 451 Sites of Environmental Contamination, Environmental Response Division, MDEQ
- Underground Storage Tank List, Underground Storage Tank Division, MDEQ
- Leaking Underground Storage Tank Sites (LUST list), Environmental Response Division, MDEQ
- Oil & Gas Contamination Site List, Geological Survey Division, MDEQ
- Hazardous Waste Generators, Waste Management Division, MDEQ
- Groundwater Discharge Permits, Waste Management Division, MDEQ
- Federal National Priority List (Superfund), information from EPA, Region 5

As part of the program plan submittal process, the location of these sites should be verified by communities and a map created which identifies their location within the wellhead protection area.

COMPLETION OF THE CONTAMINANT SOURCE INVENTORY

Not all potential sources of contamination can be identified by the agency. Land use associated with agricultural operations, commercial facilities, manufacturing and industrial facilities, institutional facilities, and utility companies may be considered potential sources of contamination and represent a threat to the PWSS. The local wellhead protection program plan should identify a mechanism for completing and periodically updating the inventory of known and potential sources of contamination.

A number of approaches are available for completing the contaminant source inventory. The approaches vary in detail and accuracy from general surveys of the wellhead protection area to identifing obvious sites of chemical storage, to onsite facility inspections, which identify the type, location, and quantity of chemicals which are present at a site. Activities which should be considered for incorporation into a local contaminant source inventory plan include:

- General surveys of the wellhead protection area to identify land uses and chemical storage which might represent a threat to the public water supply system.
- Review of tax records, property description information, and phone and business directories to identify facilities which are associated with activities where potential contaminants are used and/or handled.
- Interviews with local historians and long-time residents to identify "historic" sites of potential contamination.
- Review of records maintained by the local fire marshal, building inspector, local health department, or other local units of government which might identify facilities that store or handle chemicals.
- Onsite facility inspections.

CONSIDERATIONS IN CONDUCTING A CONTAMINANT SOURCE INVENTORY

A local plan should identify methods for completion of the contaminant source inventory which are reasonable giving due consideration to the local land use activities, related local programs and existing information. Onsite inspections provide the greatest degree of detail in the contaminant source inventory process. However, such inspections may have been completed in conjunction with other local programs by the fire marshal, building inspector, wastewater treatment plant operator, or local health department personnel. Information obtained from these sources may be sufficient to meet the objectives of the contaminant source inventory.

Onsite inspection must also be considered in view of the local political climate. Area business and industry may not be amenable to onsite inspections which they perceive as having possible "regulatory" repercussions. In such instances, door-to-door surveys conducted by area volunteers may be perceived as less threatening. Acceptance of the contaminant source inventory process may be closely tied to public education and the development of a community awareness and acceptance of the wellhead protection concept.

ABANDONED WELLS

Abandoned wells should be considered in the contaminant source inventory in all wellhead protection program plans. Abandoned wells do not represent a "potential source of contamination" in the same manner that the handling or storage of chemicals would. However, when left improperly sealed they can provide a direct conduit into an aquifer through which the introduction of contaminants may occur.

Many PWSSs may obtain a designation as "not vulnerable" through the collection of well water samples and analysis for tritium. Systems which are identified as not vulnerable are at considerably less risk from sources of contamination as a result of the local geology. Frequently, the local geology consists of a thick and impermeable clay aquiclude which will prevent the migration of contaminants into the aquifer. The local wellhead protection program should emphasize maintenance of the aquicludes structural integrity. Since abandoned wells can provide a direct conduit into the aquifer, they represent the single greatest threat as a breach of the aquiclude. Accordingly, the contaminant source inventory for systems which are not vulnerable must place a high priority on the identification of abandoned wells.

Proper closure of identified abandoned wells shall be undertaken.

SUMMARY

The contaminant source inventory is a site specific activity which is very important to the management of a wellhead protection area and will ultimately determine the necessary monitoring requirements for the public water supply system. Each community should consider the method of inventory development which best suit its needs, discuss the methods with the agency and, if necessary, provide the contaminant source inventory as a draft plan and submit it to the agency for review and comment.

Indiana

WQ-29

Wellhead Protection

for safe drinking water in Indiana

Wellhead Protection for Some Systems

Wellhead Protection Planning Overview

- Local planning team
- Delineation of the wellhead protection area
- Identification of potential sources of contamination
- Management of the wellhead protection area
- Contingency plan
- Public participation, education, and outreach

Clean, safe drinking water is vital to your community's health, economy, and future well-being. If the ground water your community uses becomes contaminated, it may be lost forever as a water supply, or it may require very expensive treatment to remain usable. The best way to make sure your water supply remains safe now and for the future is to protect the area around your wells (the wellhead protection area) from potential hazards.

This publication describes the fixed radius method to delineate a wellhead protection area, which may be an option for water supply systems that pump, on average, less than 100,000 gallons per day.

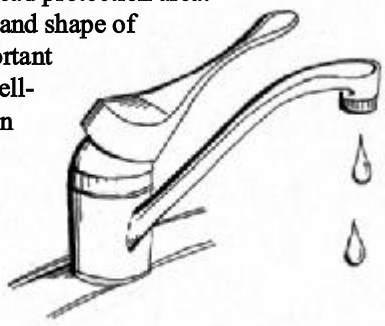
Inside

What Is Wellhead Protection?

Wellhead protection is a way to protect a water supply by managing an area around the community's wells to prevent contamination. A team of concerned community members guides the wellhead protection planning process. The process involves defining and mapping the wellhead protection area, inventorying potential sources of contamination, developing a plan to manage the area, contingency planning for possible contamination, and educating the public.

How Do You Identify Your Wellhead Protection Area?

The area that is most likely to affect drinking water quality and that therefore requires added protection is known as the "wellhead protection area." Delineation is the process of identifying the size and shape of the wellhead protection area. Delineation is important because it serves to focus the attention of your wellhead protection planning team on activities within the area that are potential contributors to ground water pollution.



Potential is the important word here, because Indiana's Wellhead Protection Rule emphasizes

prevention rather than remediation of ground water problems. Once your team identifies potentially harmful activities, it can begin developing voluntary best management programs and outreach efforts to educate those living and working within the wellhead protection area on how to safeguard the water supply.

Indiana's Wellhead Protection Rule (327 IAC 8-4.1) allows some smaller communities to choose between two separate methods for completing a delineation, depending on how much water they pump each day and how accurate they wish their delineation to be. The more scientific and accurate method requires hiring a consultant, a qualified ground water scientist, to determine the area from which the community will draw water over a five-year time period. (See "Useful Publications" for a publication on this topic.)

Some smaller communities are able to apply to IDEM to use a "fixed radius method." Using the fixed radius method provides a shortcut to delineation when compared to the standard modeled delineation process. The community public water supply systems that are eligible to use the fixed radius method may use a circle with a 3000-foot radius around their community drinking water supply well as a wellhead protection area.

Who Is Allowed to Use the Shortcut Method?

If your water supply system pumps less than 100,000 gallons per day, on average, your wellhead protection planning team may apply to IDEM for approval to use the fixed radius method for delineating your wellhead protection area. While this method will save you time and money in the short term, it is not as accurate as the methods using a computer model. It may define a larger area to inventory and manage or may fail to include some parts of the recharge area. Figure 1 is a topographic map comparing a 3000-foot fixed radius delineation with a modeled delineation of a wellhead protection area.

How Do You Apply for Permission to Use the Fixed Radius Method?

The first step is to verify whether your water supply system pumps less than 100,000 gallons per day. You may use either pumping records or well capacity data from the well log the driller filed when your well was drilled.

- If your water supply system has long-term pumping records, you can submit copies of the (monthly average) pumping records for the last five years to the Indiana Department of Environmental Management (IDEM). If your system disinfects the drinking water, this data may be found in your monthly reports of operations (MRO's). If your team does not have access to five years of metered data, make sure a meter is installed, and start collecting data as soon as possible.
- If you have well logs and well capacity data for all the wells in your system that indicates that the combined well capacities of

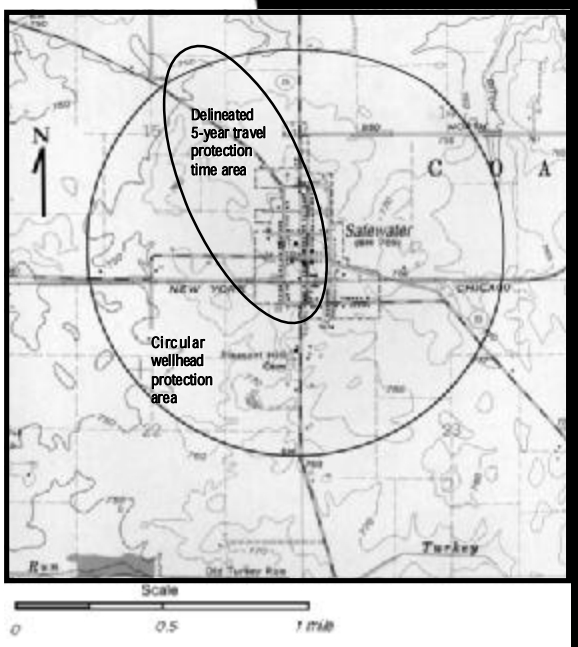


Figure 1. The shortcut, fixed radius, method of delineation may save time and money in the short term, but it is less accurate and often results in deliniating a larger wellhead protection area than a modeled delineation.

all the wells is not sufficient to produce 100,000 gallons per day, you can submit this data to IDEM as proof that your system uses less than 100,000 gallons per day.

If you have the pumping data or the well capacity data you can apply to IDEM for approval to use the fixed radius method of delineation. Figure 2 is a sample of a cover letter that you should send to IDEM with a request. Substitute information specific to your particular water supply system where it is appropriate.

IDEM Office of Water Management
Drinking Water Branch/Ground Water Section
Fixed Radius Delineation Approval
P.O. Box 6015
Indianapolis, IN 46206-6015

Re: Safewater Water Works #0000000

October 6, 1999

To Whom It May Concern:

We are requesting Fixed Radius Delineation Approval for our Wellhead Protection Plan here in Safewater, Indiana (Tippecanoe County). You will find listed below the daily pumping averages for five years spanning January 1994 through December 1998.

January-December 1994: 52,177gpd
January-December 1995: 63,029 gpd
January-December 1996: 53,432 gpd
January-December 1997: 47,495 gpd
January-December 1998: 49,779 gpd

The January 1994 through December 1998 gpd average is 53,182.

The records that we are enclosing are recorded in thousands of gallons. If you have any questions or require any more information, please call the clerk treasurer, Mary Smith at 765-555-1111. She can assist you in obtaining additional information.

Sincerely,

John Brown, Superintendent
Safewater Water Works

to IDEM
he fixed radius

If you do not have the well capacity information or the five years of pumping data, but you think that your water supply system pumps less than 100,000 gallons per day, you can contact IDEM directly (at 1-317-308-3321 or 1-800-451-6027 ext. 308-3321) and discuss the options for getting permission to use the fixed radius method.

How Do You Get Your Delineation Approved?

After you receive approval to use the fixed radius method from IDEM, you need to send an application for delineation approval to IDEM. The application should include a copy of the letter granting approval to use the method, your well logs, and a map of the area. The following steps will help guide your local wellhead protection planning team through the process of sending in the information to get your delineation approved.

Step 1: If available, obtain well logs of your public water supply wells.

You can obtain well logs from the Indiana Department of Natural Resources by calling 317-232-1106 or, toll free, 1-877-WATER 55 (1-877-928-3755), or by sending a letter requesting a copy to the Indiana Department of Natural Resources, Division of Water, 402 West Washington Street, Room W264, Indianapolis, IN 46204. Each written request should include the owner's name, facility name, the street address, and the section, township, and range location. (All available records are filed by section, township, and range, so be sure this information is included.) Water well records are also available on the Web at < http://www.state.in.us/dnr/water>.

Not all wells were recorded by the well driller when they were installed. Only the well logs that were recorded are available. If the log for your community's well is not available, your team should turn in a statement to that effect with your other documentation.

Step 2: Obtain topographic maps of your area.

A listing for several sources of topographic maps is included at the end of this publication. When ordering topographic maps, your team should be prepared to describe your location. Providing section, township, and range information is usually the easiest way to be sure you will receive the correct map(s). If your area falls at the edge or corner of a map sheet, you may need more than one sheet to show your area completely. It is a good idea to order several copies of the maps you need—at least one as a working map to use when you work on the contaminant source inventory (another part of the wellhead protection planning process), one to keep locally with a copy of your wellhead protection plan, and one for the submission package to IDEM.

Step 3: Draw a 3000-foot radius circle around the well.

Once your team has the topographic map, you can draw a circle with a radius of 3000 feet (1.5 inches on the map that is scaled at 1:24,000) with the well at the center of the circle. The area inside this circle is your wellhead protection area. Figure 1 includes an example of a circular wellhead protection area.

Step 4: Indicate location of water withdrawal facilities.

If there are other significant water withdrawal facilities in the area, your team should indicate their locations on the topographic map. Examples of significant water withdrawal facilities may include industries, agricultural processing operations, large-scale irrigation facilities, or another public water supply system. The Indiana Department of Natural Resources (toll-free at 1-877-WATER-55) can provide information about water wells, including any information on significant water users.

Step 5: Submit application for delineation approval to IDEM.

The application is available on the Web at IDEM's Web site. (See "Indiana Information Contacts" listed at the end of this publication.) Although the application covers the entire process, IDEM has suggested that you send the delineation section first. Complete the first page and the top of page 4 on the application form for this part of the submission. Three things need to be included in the initial submission to IDEM.

1. A copy of the letter from IDEM granting approval for use of the fixed radius method.
2. The well log information on your public water supply system's pumping wells (Step 1).
3. The topographic map showing:
   - the wellhead protection area boundary (Step 2).
   - the location of the public water supply system's pumping wells (Step 3).
   - the locations of all other significant water withdrawal facilities in the area (Step 4).

Send these three things along with a copy of the wellhead protection plan application to:

Wellhead Protection Program
IDEM, Drinking Water Branch
P.O. Box 6015
Indianapolis, IN 46206-6015

IDEM will respond to your application. However, if the response takes longer than you would prefer, your team should continue working on the remaining parts of your wellhead protection plan. By continuing to work on the plan, initial enthusiasm remains high, and your team makes progress toward the goal of wellhead protection planning.

What's Next?

Wellhead protection is a multi-step process. Once the delineation is approved, your team can focus on the task of inventorying the wellhead protection area for potential sources of contamination. Other tasks include determining how to manage the wellhead protection area to reduce the risk of contamination, contingency planning in case of future contamination, and educating the public about ground water and wellhead protection. Publications on each of these topics are available now, or will soon be available from your local Purdue Extension county office. (See "Useful Publications.")

Useful Publications

The following Purdue Extension publications provide information about other aspects of the wellhead protection process.

- WQ-2, "What Is Groundwater?"
- WQ-24, "Wellhead Protection in Indiana"
- WQ-28, "Forming the Wellhead Protection Planning Team"
- WQ-30, "Choosing a Consultant to Delineate the Wellhead Protection Area:"
- WQ-31, "Inventorying Potential Sources of Drinking Water Contamination"
- "Protecting Your Drinking Water: What Every Citizen Should Know About Wellhead Protection" and "Wellhead Protection: What Every Farmer Should Know About Wellhead Protection." *These short brochures may be useful in your outreach efforts.*

All these publications are free. Contact your local county Purdue Extension office, or call 1-888-EXT-INFO to obtain these or other publications.

The USEPA has an informative publication, "Wellhead Protection, A Guide for Small Communities," EPA/625/R-93/002, available free by calling 1-800-490-9198.

Sources for Topographic Maps

- Purdue University, West Lafayette Campus. If you know the name of your map, you can send a check for $4 per map, plus $2 for shipping to LARS, Purdue University, 1202 Potter Engineering Center Room 376, West Lafayette IN 47907-1202 (765-496-3209), or email <esei@ecn.purdue.edu>. Please include your phone number in case more information is needed.
- The Indiana Department of Natural Resources, DNR Map Sales Section, 402 West Washington Street, W-160, Indianapolis, IN 46204-2742, or call 317-232-4180.
- The Indiana Geological Survey Publication Sales Office at Indiana Geological Survey, 611 North Walnut Grove, Bloomington, IN 47405-2208, or by phone at 812- 855-7636. They can determine the proper map to supply if you provide the name of a town, river, or other named landmark nearby. Maps are $4 each, plus tax, with a $3 shipping and handling charge.

Indiana Information Contacts

- The Purdue Extension office in your county can provide you with information and resources on water quality protection. Look in the phone book under "County Government," or call 1-888-EXT-INFO.
- "Safe Water for the Future" is a Purdue Extension program that provides resources on drinking water protection for individuals and communities. Call 765-496-6331, or visit their Web site at <http://www.ecn.purdue.edu/safewater>.
- Indiana Department of Environmental Management, Ground Water Section, can provide information on Indiana's Wellhead Protection Program. Call the Groundwater Section at 317-308-3321 or 1-800-451-6027, ext. 308-3321. Information is also available on the Web at <http://www.ai.org/idem/owm/dwb> under "Wellhead Protection."
- Indiana Water and Wastewater Association provides training and on-site assistance to water supply operators. They can be reached at 1-888-937-4992 or through the Web at <http://www.iwwa.com>.
- The Indiana "Rural" Water Association also provides education and assistance to water supply operators. You can reach them at 812-988-6631 or Fax 812-988-6961.

Knowledge to Go
Purdue Extension

BURNSIDE

Appendix J
Guideline for Environmental Review Policies

Guideline for Preparing Terms of Reference for An Environmental Review

The following is intended to serve as a guide for anyone planning to develop land within designated sensitive areas. Prior to retaining a consultant to complete an environmental review, developers and/or landowners are encouraged to meet with the Municipality/Township to discuss the scope and specific terms of reference for an environmental review. Terms of reference, as required, must be submitted to the Planning Department for approval.

1 – Site Contouring and Geotechnical Considerations

Site Contouring

If site contouring is required to facilitate development, the location of any and all site contouring that is required should be determined, and shown on a site plan.

If site contouring is required, this part of the Environmental Review should include:

- Recommendations for excavating, filling and final topographic changes and slopes;
- Potential areas where significant site contouring may occur (this should be done after consultation with the municipal engineer and planner);
- An on-site investigation of these areas; and
- A report on investigation results and potential recommendations.

Soil Stability and Geotechnically Sensitive Areas

An environmental review may require an analysis of the proposed land use and the existing soils to determine areas where the existing soils may be not adequate so support development. This survey should identify potential geotechnically sensitive areas and include recommendations regarding the stability and handling of the soils. In particular, this survey should:

- Collect, review and present available information, including surficial geology maps and aerial photography;
- Identify and present geotechnically sensitive areas and determine the characteristics of these areas;
- Assess areas where the proposed land use may not be accommodated by actual site conditions;
- Establish and present recommendations for the geotechnically sensitive areas within the various land uses;
- Identify and present an inventory of on-site materials may be used for backfilling and which on-site materials should be removed; and
- Include test pitting on site to determine subsurface conditions.

Erosion

It is expected that both potential erosion and flooding will be controlled by way of the storm water management system. An environmental review should investigate and report on any areas potentially susceptible to erosion, and include recommendations to address possible concerns.

This part of an Environmental Review will likely require some direct liaison between the proponent, the consultant preparing the Environmental Review, the municipal engineer and the municipal planner and may also include liaison with the consultant responsible for the storm water management study. If required, this study should:

- Identify and report on those areas within the proposed development where erosion may potentially occur;
- Perform geotechnical investigation and analysis as required;
- Investigate soil stability and potential impact on surface water; and
- Provide recommendations.

2 – Water

Stormwater Management and Drainage

A stormwater management and water quality study should form the basis for a master drainage plan for development. A stormwater management plan will investigate stormwater patterns and quality, anticipate the effects of development, and include recommendations for comprehensive stormwater management and treatment. This study should include:

- A compilation of all information relating to the on and off-site existing storm water system;
- Consultation with the Ministry of the Environment regarding any concerns or information;
- The identification of tributary areas and major off-site drainage routes;
- A survey of pre-development conditions;
- An analysis showing the anticipated post-development conditions;
- An analysis of the potential downstream problems, considering both peak flow and low flow situations;
- A management plan with concepts for stormwater management, including treatment; and
- Liaison with aquatic habitat consultant to determine low flow and pond requirements.

Groundwater Management

In some areas, natural springs are known to occur. An environmental review of any development site should:

- Obtain information from any previous well drilling;
- Assess pre-development groundwater conditions;
- Identify connections between groundwater and surface water;
- Include recommendations for management of groundwater; and
- Assess the anticipated post-development situation with respect to groundwater.

Flood Control

It is expected that both potential erosion and flooding will be controlled by way of the stormwater management system. This study should investigate areas potentially susceptible to flooding, and will include recommendations to address possible concerns. This study should:

- Identify the areas in which potential flooding might occur;
- Liaise with the consultant responsible for the stormwater management study;
- Perform geotechnical investigation and analysis as required;
- Investigate soil stability and potential impact on surface water; and
- Provide recommendations.

3 – Environmentally Sensitive Ecosystems Management

Identification of Environmentally Sensitive and Undisturbed Natural Areas

An environmental review of any potential development site should include a survey of Environmentally Sensitive areas and undisturbed natural areas. In particular, this study should:

- Identify plant species, taking into account the list of sensitive species
- Classify environmental sites based on the identification of species contained within sample plots;
- Evaluate the overall fit of the completed project to its site;
- Coordinate the consulting team conducting the aquatic habitat study, and the wildlife habitat protection and enhancement study; and
- Recommend areas that may be developed, and areas that should remain untouched.

Protection of Environmentally Sensitive and Undisturbed Natural Areas

Working from the report identifying environmentally sensitive and undisturbed natural areas, a study should be undertaken which proposes a methodology for protecting these areas. This study should:

- Identify the terrestrial and aquatic habitat, environmentally sensitive areas, or untouched natural areas for which protection is proposed;
- Identify measures for the protection of these areas within the development scheme during construction and after build out; and
- Identify measures for the protection of these areas after development has occurred.

Wildlife Habitat Protection and Enhancement

The natural environments within the study area often provide habitat for a variety of animal species. A site analysis should be undertaken to identify the range of pre-development wildlife species and their associate habitats. The result of this study will be identification of measures to mitigate the impact of the site development on the wildlife population as well as their natural environment. This study should:

- Identify all wildlife species on the site;
- Identify the vegetation that supports the wildlife population including a list of the species, their location and quantities;
- Include plots cataloguing where investigation has taken place;
- Identify the opportunities to retain and enhance habitat areas within the development scheme during construction and after buildout;
- Provide recommendations with regard to maintaining wildlife corridors through the development site both during construction and after buildout;
- Identify opportunities to reintroduce wildlife species that may migrate off the site during development; and
- Coordinate and liaise with the consulting team responsible for the study to identify environmentally sensitive areas.

Aquatic Habitat Protection and Enhancement

The aim of an aquatic habitat study is the long-term protection of wetlands and watercourses, and the enhancement of these areas by identifying the habitat and the associate aquatic life forms that exist within them. This study should:

- Identify fish, reptiles, and amphibians in the watercourses and wetland habitat areas;
- Identify the aquatic vegetation that supports the aquatic population, including a list of the species and their location. This work will include sample plots cataloguing where investigation has taken place;
- Review of existing water quality;
- Coordinate and liaison with the consulting team responsible for the studies addressing wildlife protection and identification of environmentally sensitive areas;
- Coordinate work with the stormwater management consultant;
- Identify the low flow and pond design requirements; and
- Identify the opportunities to retain and enhance aquatic habitat areas within the development during construction and after buildout.

Overall Environmental "Fit" of a Project to an Area

Upon completion of the first phase of the various studies which form an Environmental Review, a thorough review and comprehensive summary should be provided that determines the overall impact of the development. This summary document should provide:

- A comprehensive list of the developments impact;
- Strategies for the management of potential consequences of site development;
- Strategies for the mitigation of possible negative consequences of development; and
- Viable solutions for the management and mitigation of the potential consequences of site development.

BURNSIDE

Appendix K
White Paper on Watershed-based Source Protection Planning

White Paper on Watershed-based Source Protection Planning

February, 2004

Ontario

White Paper on Watershed-based Source Protection Planning

Integrated Environmental Planning Division,
Strategic Policy Branch
Ministry of the Environment

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Ontario

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SECTION 1: INTRODUCTION

Safe, clean drinking water is fundamental to the health and well being of Ontarians. Having an adequate supply of drinking water is also essential for strong, lasting, and prosperous communities.

While Ontario has some of the world's largest supplies of drinking water, there are increasing threats to our drinking water. Population growth and the expansion of commercial, industrial, and agricultural enterprises, among others, affect our watersheds and groundwater recharge areas, making the job of supplying safe drinking water at the tap ever more difficult and expensive.

The government is making the protection of our drinking water sources a much higher priority than it has been in the past. Why?

First and foremost, it protects public health. But safeguarding source water also has economic and environmental benefits. Once a water source is contaminated, it can be difficult, expensive, and sometimes impossible to replace or restore it. That is why the Government of Ontario is committed to developing a comprehensive source water protection framework and to taking steps to better protect the sustainability of Ontario's water resources.

Source water protection is about taking action to protect the *quality* of our drinking water sources from contamination. It is also about protecting the *quantity* of our drinking water supplies from unacceptable impacts of water takings.

Protecting both the quality and quantity of our water resources is the best way to guarantee that Ontario will have enough valuable clean water for years to come.

Purpose

The government knows that Ontario needs the right rules in place to protect our valuable water resources, for ourselves and for future generations. That is why the government has committed to implementing the 121 recommendations made by Commissioner O'Connor in the Report of the Walkerton Inquiry (Parts One and Two)[1]. The purpose of this White Paper is:

- To inform Ontarians of the proposed approach for the development of a watershed-based source water protection program, including how stakeholders and the public will be involved.

[1] The Walkerton Commission of Inquiry, headed by Mr. Justice Dennis O'Connor, examined the May 2000 contamination of the Walkerton water supply and the safety of Ontario's drinking water. The Part One Report was released in January 2002 and the Part Two Report was released in May 2002.

- To describe the legislative framework proposed for the development and approval of source water protection plans.

- To examine ways of ensuring Ontario has a sustainable supply of water by enhancing its management of water takings, including improvements to the Ministry's water takings program and the development of a framework that would govern how those who take water should be charged.

This White Paper is put before Ontarians for discussion and comment.

The responses and advice that are received will help refine Ontario's policy and legislative framework for source water protection planning. It will also help to identify needed improvements to our water taking programs and to inform the development of a framework for water taking charges.

The government is currently also taking action to develop the implementation aspects of source water protection. The recently-established Technical Expert Committee and Implementation Committee will be providing the government with advice on:

- a process for assessing threats to sources of drinking water in Ontario;
- best management strategies to protect watersheds; and
- innovative funding mechanisms and incentives.

Future consultations will be undertaken when the committees provide their advice to the province.

Need for action

Water treatment alone cannot ensure that we can meet our needs for good quality water. Even with the best water treatment technology money can buy, a community is at risk if it relies on a water source that is susceptible to contamination – we have to start at the source.

Ontario must place greater emphasis on protecting the sources of our drinking water. Now, source water protection planning is undertaken on a voluntary basis by municipalities and conservation authorities, leading to inconsistencies across the province. Without a comprehensive source water protection program, public health remains at risk.

Part of protecting our water resources is to better manage how much water is taken out of the watershed for human use. Current laws and regulations provide statutory authority, but not the modern regulatory tools needed to manage the water being taken from Ontario's lakes, streams and aquifers in a comprehensive manner. That is why we will improve how we preserve the quantity of our valuable water resources through updating the 'permit to take water' program and implementing a framework for water taking charges.

What else are we doing on source water protection?

On November 14, 2003, acting on the recommendation of the Advisory Committee on Watershed-based Source Protection, the government announced the establishment of two expert source water protection committees:

- The 21-member Implementation Committee is tasked with providing advice to the government on tools and approaches to implement watershed-based source protection planning. One of the committee's first tasks is to provide advice on new and existing roles and responsibilities of the province, municipalities and conservation authorities to implement source protection plans. The committee is also examining innovative funding mechanisms and incentives.

- The 16-member Technical Experts Committee is providing advice on an Ontario-based threat assessment process. The committee is providing advice on areas including:
  - categorizing threats to water;
  - linking groundwater protection to surface water management;
  - the effects of water-takings on the availability and quality of drinking water;
  - appropriate risk management tools for various levels of threats; and
  - protecting both current and future drinking water sources.

Both committees are building on the recommendations of the Advisory Committee on Watershed-based Source Water Protection Planning[2].

- On December 18, 2003, the government announced a moratorium on new and expanded water taking permits for products such as bottled water. The moratorium is in effect from December 18, 2003 until December 31, 2004. It ensures that 'permits to take water' will not be issued for new and expanding water bottling operations and certain other commercial takings until new rules are developed. The new rules will be in effect before the moratorium is lifted.

And, through this White Paper, the government is addressing even more of the recommendations of Commissioner O'Connor and building on the framework proposed by the Advisory Committee on Watershed-based Source Protection Planning by:

- Developing source water protection legislation[3].

- Engaging in wide consultation on the content of the proposed legislation before introducing it into the Legislature[4].

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[2] The *Final Report: Protecting Ontario's Drinking Water: Toward a Watershed-based Source Protection Planning Framework* of the Advisory Committee on Watershed-based Source Protection Planning contains 55 recommendations and was released in April 2003.

[3] Refer to the Part Two Report of the Walkerton Inquiry recommendation no. 68 and the Advisory Committee on Watershed-based Source Protection Planning recommendation no. 7.

- Ensuring that watersheds across Ontario have source water protection plans[5].

- Strengthening provincial rules to ensure that the approval of water takings is based on a comprehensive approach to managing water.

Organization of the White Paper

The paper is organized into four sections:

- **SECTION 1: INTRODUCTION** provides context for the discussion on source water protection and the government's actions on source water protection.

- **SECTION 2: BACKGROUND** helps to answer some basic questions that readers may have about source water protection.

- **SECTION 3: PROPOSED SOURCE WATER PROTECTION LEGISLATION** sets out the proposed content of source water protection planning legislation.

- **SECTION 4: IMPROVING THE MANAGEMENT OF WATER TAKINGS** outlines how the Ministry is proposing to approach its review of the existing water takings program and its development of a framework for water taking charges.

How to participate

The province is seeking your written comments on its *White Paper on Watershed-based Source Water Protection Planning*. The deadline for receiving your comments is **April 12, 2004**].

You may send your comments by mail, fax or email to:

Ontario Ministry of the Environment
White Paper on Watershed-based Source Water Protection Planning

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[4] Refer to the Advisory Committee on Watershed-based Source Protection Planning recommendation no. 41.
[5] Refer to the Part Two Report of the Walkerton Inquiry recommendation no. 1.

This paper can be reviewed online at www.ene.gov.on.ca.

Provincial representatives will also be meeting with key stakeholders on source water protection issues across Ontario between March 1-23 in:

- London on March 1st ;
- Kitchener-Waterloo on March 2nd;
- Peterborough on March 4th;
- Kingston on March 5th;
- Ottawa on March 8th;
- Thunder Bay on March 10th;
- Sudbury on March 12th; and
- Toronto on March 23rd, to obtain their views directly.

Further information on actions to protect Ontario's drinking water is available on the Ministry of Environment web site at www.ene.gov.on.ca. Or contact the Ministry's Public Information Centre, toll-free at 1-800-565-4923, TTY:1-800-387-5559, in Toronto call (416) 325-4000.

SECTION 2: BACKGROUND

This section provides an introduction to some of the basic concepts involved in source water protection planning.

What is source water protection?

Source water protection is the first barrier in a multi-barrier approach to ensuring safe drinking water that safeguards the water in our lakes, rivers and aquifers. Source water protection involves a series of inter-related components, with feedback loops between its constituent parts.

In the assessment phase, it requires undertaking a study of the potential sources of contamination, determining how much water is really available for human use in a watershed, and evaluating where that water is vulnerable to contamination. In the protection phase, source water protection involves implementing programs aimed at minimizing the chances of contaminants entering the water resource. These programs work to manage identified risks to water quality and quantity through a combination of direct controls, incentives, and voluntary measures to ensure long-term protection of current and future drinking water sources.

Management strategies to implement source water protection are a mixture of localized measures, designed to protect individual sources, and wider-ranging measures, designed to protect the larger water resource body. The latter can be done on a regional, provincial, national or even international (e.g., the Great Lakes) scale.

Threats to drinking water sources may be natural or may be brought about by human activity. The manner in which threats are managed must be defined on a site-specific basis according to the level of risk a threat represents to the water source.

Both surface and groundwater resources face the threat of contamination at the source. The inter-relationship between ground and surface water means that contaminants can migrate between the two. As a result, both surface and ground water resources must be adequately protected to ensure the safety of drinking water supplies.

Though Ontario does not now have a specific piece of source water protection legislation, the Provincial Policy Statement, issued under the *Planning Act*, provides direction and leadership in this area. It states: “The quality and quantity of groundwater and surface water and the function of sensitive groundwater recharge/discharge areas, aquifers, and headwaters will be protected or enhanced.”

The Provincial Policy Statement is now undergoing a mandated five-year review. Stakeholders, in the consultations held to-date, have identified water as a key provincial resource and made recommendations that would increase its level of protection. The review process is still under way and, until it is complete, the current Provincial Policy Statement remains in effect.

GROUND AND SURFACE WATER

Surface waters are defined as above-ground water sources, including lakes, streams and wetlands. Groundwater is water that has percolated into the ground and occupies spaces between soil particles or cracks and fissures in otherwise solid rock. Both sources are vulnerable to contamination from agricultural, industrial and municipal sources.

Groundwater can become contaminated through infiltration from surface contaminants, from improperly constructed or decommissioned wellheads that can act as conduits of contaminants, or from underground sources such as septic systems or storage tanks. A surface source of groundwater contaminants could include the leakage or spill of a contaminant on the ground.

Both ground and surface water are at risk from point and non-point sources of contamination. And, once contaminated, it is often very difficult to remove contaminants, some of which may stay there for decades or even centuries.

What is a watershed?

The term ‘watershed’ is normally associated with surface water resources and describes an area of land that drains downwards towards lower elevations. Drainage pathways generally converge at rivers or lakes, which tend to become progressively larger as the water moves further downstream through the watershed. Other common terms used to describe a watershed include ‘drainage basin’ or ‘catchment area’. Watersheds may be large or small, and several smaller watersheds may join together to form a larger watershed.

The concept of a ‘groundwatershed’ is more complex and far more difficult to map. However, it generally refers to the area that contributes water to a particular aquifer or water-bearing zone with an aquifer complex.

Ontario has delineated its watersheds by size. Primary watersheds are the largest. Secondary watersheds are smaller watersheds nested within the primary watershed boundaries. Tertiary watersheds are smaller still, nested within secondary watersheds. Further sub-watersheds can be defined. (See Appendix 1, Figure #1)

Why are source water protection plans best developed on a watershed basis?

The purpose of source water protection plans is to coordinate actions in a way that maximizes the protection of public health and the safeguarding of source water quality and quantity over the long term.

Watersheds are generally considered to be the most practical unit for managing water . This is because impacts are felt at the watershed level, rather than at the level of political boundaries, such as municipalities. As water flows downhill or seeps into groundwater, pollution discharged to the upstream segments impacts the downstream segments of the same river system. As water combines with pollution discharged from downstream sources, the effects are cumulative. (See Appendix 1, Figure #2)

For example, at the local level, a township controls the operation of the drinking water treatment facility and distribution system. However, the township does not typically have control over the quality of its source water because the source is impacted by activities that reach far out into the watershed beyond the township's boundaries. For instance, there are 34 upper and lower tier municipalities in the Grand River watershed. This is why partnerships across all lines – jurisdictional, governmental, and property – are crucial to source water protection efforts and why source water protection planning must involve stakeholders from across the watershed.

Multi-Barrier Approach to Drinking Water Safety

In Part Two of the Report of the Walkerton Inquiry, Commissioner O'Connor made 22 recommendations related to source protection, including a recommendation that source protection plans should be required for all watersheds in Ontario. The overall premise of his recommendations is that the best way to achieve a healthy public water supply is to put in place *multiple barriers* that keep water contamination from reaching people.

The 'multi-barrier approach' covers all elements of the provision of drinking water from source water protection, to treatment, distribution, monitoring and responses to adverse conditions, including specific responses for emergencies. Although each barrier offers protection, no single barrier is 100% effective. Thus, an over-reliance on only one barrier at the expense of another increases the risk of contamination. Leaving out key steps at one stage can negate the effect of other stages.

Five types of barriers are commonly used in the provision of drinking water:

- Source water protection keeps the raw water as clean as possible to lower the risk that contaminants will get through or overwhelm the treatment system.
- Treatment uses one or more than one approach to remove or inactivate contaminants.
- Distribution system security prevents the intrusion of contaminants and ensures an appropriate free chlorine residual throughout.
- Automatic Control or Early Warning Monitoring detects contaminants that exist in concentrations beyond acceptable limits and return systems to normal operation.
- Responses to Adverse Conditions that are thorough and effective help to prevent adverse health impacts and further water degradation when other processes fail.

SECTION 3: PROPOSED SOURCE WATER PROTECTION PLANNING LEGISLATION

The Ontario government is planning to introduce legislation that would make locally-developed source water protection planning mandatory in watersheds across the province. This is consistent with the recommendations of Commissioner O'Connor in the *Part Two Report of the Walkerton Inquiry* and of the Advisory Committee on Watershed-based Source Protection Planning. Detailed regulations would also be developed to support the source water protection planning process.

Purpose of source water protection planning legislation

The purpose of the legislation would be to protect drinking water sources by requiring watershed-based source water protection plans to be developed and implemented in watersheds across Ontario.

The overarching goal would be to protect human health by ensuring that current and future sources of drinking water in Ontario's lakes, rivers and groundwater are kept from potential contamination and depletion. In addition, these plans would help maintain and enhance the ecological, recreational, and commercial values of our water resources.

The Great Lakes and Source Water Protection

The Great Lakes Basin is a complex system that includes not only the five Great Lakes, but also a system of streams, rivers and smaller lakes that drain large tracts of Ontario. The Great Lakes drainage basin, on both sides of the international border, measures approximately 775,000 square kilometers.

The Great Lakes serve as a source of drinking water for almost three-quarters of Ontario's population. There are already many programs in place, and even more are being established, to address the issue of direct discharges into the Great Lakes. These programs include:

- Lakewide Management Plans (LaMPs) are bi-national agreements aimed at understanding the lakewide problems and ecological impairments on each of the Great Lakes.
- Municipal Industrial Strategy for Abatement (MISA) govern waste water discharge standards for nine different industrial sectors to improve water quality draining into the Great Lakes.
- Sewage Treatment Plants÷Certificates of Approvals: Discharges from municipal waste water facilities are currently controlled through approvals under the *Ontario Water Resources Act*. Improved and updated waste water discharge limits applied through these approvals will make a significant contribution to source water protection and improvement of the quality of waters draining into the Great Lakes.
- Urban Stormwater Management: Stormwater management mitigates the effects of urbanization on

the hydrologic cycle including increased runoff, and decreased infiltration, of rain and snowmelt. A stormwater management strategy may include protection of natural areas, design of communities to reduce stormwater generation, and pollution prevention programs, as well as other stormwater management practices.

- Canada-Ontario Agreement Respecting Great Lakes Ecosystems (COA) represents a commitment to reduce the amount of pollution entering the basin, improve and protect the fish and wildlife habitat, work towards safe water to swim in and drink, as well as fostering a sense of stewardship.

Source water protection as envisaged in this paper would focus on inland surface water and groundwater. The above mentioned Great Lakes programs would continue but source water protection plans would be required to have regard for the agreements and other strategies that Ontario has entered into with respect to the Great Lakes, including the Great Lakes Charter and COA. Note that the LakeWide Management Plans and the Remedial Action Plans undertaken under COA include contaminant and nutrient management, as well as ecological protection. These objectives complement the proposed source water protection framework.

Source water protection will make significant contributions to the Great Lakes by helping to improve the quality of water that flows into the Great Lakes. Together, source water protection plans and Ontario's comprehensive Great Lakes programs would complement each other and contribute to the protection and improvement of the Great Lakes water quality and quantity.

Watershed areas

By definition, the source water protection plans would be 'watershed-based'. For planning purposes, the watershed boundaries now used in the operation of Ontario's thirty-six Conservation Authorities are expected to be the starting point. The legislation would allow these boundaries to be changed when necessary. For example, some small areas of land in southern Ontario are not currently part of a conservation authority. The legislation could permit the current boundaries of conservation authorities to be amended for the purposes of source water protection planning and other purposes. [6]

In Northern Ontario, where a considerable amount of land is not covered by a conservation authority, the proposed legislation would provide the Ministry of the Environment with the authority to define the boundaries for watershed planning. Here, secondary watershed boundaries would likely be used for planning purposes.

[6] These boundary adjustments may be undertaken under the *Conservation Authorities Act*.

Conservation Authorities
Of the 36 Conservation Authorities in Ontario, 31 cover southern Ontario, while the remaining five have been established for the watersheds surrounding the major population centres of Northern Ontario. See Appendix 1, Figure #3 in for a map showing the boundaries of the Conservation Authorities.

Watershed regions

The Advisory Committee recognized that there should be a formal mechanism for conservation authorities to pool resources, share expertise and coordinate work in the preparation of source protection plans. In order to accomplish this, watersheds would be grouped into watershed regions comprised of two or more watersheds.

The Ministry is currently working with Conservation Ontario to organize watersheds into regions for the purposes of timely and efficient delivery of source water protection plans across Ontario's 36 conservation authorities.

Source water protection planning will require coordination among neighbouring watersheds because important hydrologic features, such as regional aquifers, may bridge watersheds and because municipal boundaries may also cross watersheds. To facilitate efficient use of resources and coordination of source water protection planning, individual watersheds will be grouped. A map showing possible boundaries for establishing watershed regions is provided in Appendix 1 Figure #4[7].

Establishing watershed regions would help ensure that source water protection planning is efficient and effective. It would mean that the specialists with the technical skills needed for source water protection planning could be efficiently utilized (e.g., water resource engineering, hydro-geology, land use planning, agricultural production, geographic information systems and education / consultation). It should also result in effective coordination of planning activities among neighbouring watersheds (e.g., conducting watershed studies, building the knowledge base, and the development of source water protection management strategies).

Considerations in establishing watershed regions would likely include bringing conservation authorities with the most experience in watershed planning together with less experienced conservation authorities. Municipal and First Nations boundaries would be another factor. The existence of common hydrologic features such as regional aquifers would be yet another consideration in the determination of watershed regions.

Watershed regions would be designated through an agreement between the Minister and the affected conservation authorities, with the Minister retaining the authority to amend the designated groupings at any time.

[7] Before designating the composition of each watershed region, the proposed groupings would be posted on the Environmental Bill of Rights Registry.

Lead conservation authority in a watershed region

In watershed regions with more than one conservation authority, a lead conservation authority would be designated for administrative purposes. Lead conservation authorities would have the following administrative responsibilities:

- working with the source protection planning board (SPPB) in each watershed to recommend a chair for the Source Protection Planning Committee (SPPC) for the watershed region to the province (see following sub-sections for details on SPPBs and SPPCs);
- working with the SPPB to establish an SPPC for the watershed region, while also ensuring proper stakeholder representation on the committee;
- serving as the coordinating body for the technical experts and use of technical and other shared resources; and
- assisting each SPPB to establish work planning priorities with the SPPC.

The SPPBs would be responsible for recommending a lead conservation authority for each region to the province. The Minister would have the authority to designate the lead conservation authority. It is anticipated that the 'lead' would go to the conservation authority within the watershed region with the most experience in, and capacity to coordinate, watershed management.

Source protection planning board

Source Protection Planning Boards (SPPB) would be established in each watershed to coordinate and review a number of the key functions that are part of the overall source water protection planning process (Appendix 1, See Figure #5).

In watersheds where there are conservation authorities, the SPPB would be the board of directors of the conservation authority (CA board). Though some municipalities now choose not to participate in their local conservation authority, the proposed legislation would be expected to require all municipalities in the planning area to participate in source water protection planning and other projects as necessary to the process. [8] Since the capacity of conservation authorities varies (e.g., some limit their scope to flood control in river basins), there may be the need to provide for an alternative approach in some cases.

The legislation would provide the authority to designate an SPPB in areas with no conservation authority.

[8] This mandatory participation may be accomplished through amendments to the *Conservation Authorities Act.*

Governance Options for Consideration

Three potential governance structures that could carry out source water protection planning in watersheds with no conservation authorities are:

1. The five conservation authorities in Northern Ontario (Lakehead, Sault Ste Marie, Nickel District, Mattagami, North Bay-Mattawa) could coordinate plan development within their current watershed jurisdiction, as well as the entire secondary level watersheds in which they are situated. For some of these conservation authorities with smaller capacity, this may mean a joint lead with their primary municipality (e.g., Mattagami working with the City of Timmins).

2. Where no conservation authority exists, one could be established or lead municipalities with planning capacity in a secondary watershed could coordinate plan development (e.g., the District of Muskoka or Kenora).

3. In secondary level watersheds without municipal authority, consisting primarily Crown land), the Ministry of the Environment, or other ministry as appropriate, could coordinate plan development.

The primary responsibilities of the SPPB would be to review the work of the Source Protection Planning Committee (SPPC), specifically:

- reviewing and approving the Terms of Reference for the source water protection planning process based on the legally binding directions provided by the Ministry;
- ensuring that the source water protection assessment and plan comply with the requirements of the legislation and the provisions of the Terms of Reference, including the provisions governing public participation;
- working with the SPPC towards achieving supporting resolutions from 100% of municipal councils; and
- seeking formal documentation of the level of support for a source water protection plan.

The SPPB would be required to consider objections to the plan and attempt to resolve outstanding issues, ensuring that objections, and the approach taken to attempt to resolve them are documented. Once developed, the SPPB would submit the recommended draft source water protection plan to the Ministry for approval.

In addition, the SPPB could also be required to undertake other tasks, perform other duties and meet other requirements that may be specified in the legislation and regulations.

Where a watershed region has been established through an agreement between participating conservation authorities and the Minister, the legislation would provide the authority to delegate duties amongst participating SPPB in the agreement.

Source protection planning committee

Each watershed region would have a multi-stakeholder source protection planning committee (SPPC). The SPPC would coordinate the development of the source water protection plan (or plans) for the watershed region, and ensure plans conform to the source water protection legislation, regulations and associated guidelines.

The primary functions of the SPPC would be to:

- develop terms of reference for the source water protection plan within the watershed;
- provide direction for the development of the draft source water protection assessment and source water protection plan for each watershed in accordance with the source water protection legislation and regulations;
- coordinate the collection and analysis of technical data to support the source water protection plan and ensure the best available science is used;
- establish a watershed sub-committee with representatives of all municipalities in the watershed region as a formal mechanism for ongoing consultation during development of the source water protection plan;
- establish, as necessary, sub-committees for other stakeholders;
- establish and co-ordinate a transparent local consultation process to ensure broad consultation based on minimum requirements set by the Ministry (e.g., SPPC meetings to be advertised and open to the public to the extent possible; draft plans and proposals published and made widely available; inviting the public to provide their comments and input in writing);
- once completed, submit the draft plan to the SPPB for review;
- work with the SPPB toward achieving supporting resolutions from 100% of municipal councils;
- undertake other tasks, perform other duties and meet other requirements as specified in the legislation and regulations; and
- at key milestones, assess the appropriateness and validity of the approach, the science, and operational / management practices used in plan development.

The lead conservation authority would be responsible for establishing the SPPC. Where there are no conservation authorities, the SPPBs would establish the SPPCs.

Composition and Size of the SPPC

The Minister of the Environment would appoint the chair of the SPPC based on recommendations from the lead CA in each watershed region (or the designated planning body in areas with no conservation authorities).

The proposed model of the SPPC is that it would be comprised of five municipal representatives and ten other stakeholders including representatives of the following: one to two First Nations, one to two public health bodies, one to two members from the agricultural sector, one member of the public and four to five other members representative of other stakeholders (to be determined locally).

Provincial and federal representatives would participate *ex officio* on the SPPC. They would also participate through working groups and may sit *ex officio* on sub-committees.

The proposed maximum membership is 15 members, plus the chair.

Where local circumstances require, and a suitable rationale is provided by the SPPB, there could be exceptions made to the above rules (e.g., SPPC memberships could be task- or time-limited).

Local Leadership

Collaboration is the best way to establish durable solutions. Therefore, a key objective of source water protection planning would be to create effective partnerships among local stakeholders. Stakeholders are defined as those having an interest in the watershed management process or those who may influence or be influenced by decisions taken as a result of the process. This would include those affected by water quality or quantity issues or problems, those who may have their activities impacted by management and regulatory actions stemming from source water protection, and those who are responsible for managing water resources.

Source water protection planning is always a complex undertaking and it may be necessary to make 'trade-offs', making it all the more important for local stakeholders to work together to reach consensus on local priorities.

Opportunities for Stakeholder Involvement

There would be a number of mechanisms in addition to the SPPC for stakeholders to be involved in the development of their local source water protection plan. This could include participating in working groups established by the SPPC to work on specific aspects or tasks associated with the planning process. The working groups would assist with the technical work and other tasks related to the development of source water protection plans.

Representatives of key stakeholders such as municipalities, conservation authorities, provincial ministries or other organizations with a technical capacity are likely to be involved in a number of working groups. These groups would be responsible for tasks such as undertaking technical studies of water resources in the watershed during the assessment phase and for developing management strategies in the plan development phase. Municipalities would play a key role in working groups, given their expertise in key areas, including well head protection and land use planning. Each stakeholder or group would be able to select their own representatives for the SPPC (e.g., elected officials or municipal staff could participate).

Other stakeholders could be asked to deal with local sub-watershed issues where it is more practical and efficient for a working group (or sub-watershed committee) to play a role in researching and addressing targeted issues with a localized impact.

Transparency to the Public

The requirement for at least one member of the public to participate in the SPPC would ensure a minimum level of public representation.

To further ensure a transparent local consultation process, other steps would be required in the planning process. For example, source water protection meetings would be advertised and open to the public to the greatest extent possible. Assessment reports and draft plans and status reports would be published widely and available for public comment. Adequate time would be provided to ensure that a wide range of views are fully canvassed and public input is recorded.

Terms of reference for source water protection plans

One of the first steps in the plan development process would be the development of a terms of reference to govern the watershed-based source water protection planning process (See Appendix 1, Figure #6).

The Ministry of the Environment would issue legally binding directions to the SPPB governing the preparation and content for the terms of reference. All source water protection plans would have to adhere to a consistent provincial standard set through regulations but the content requirements are expected to be flexible enough to accommodate local conditions that will vary from watershed to watershed. The SPPC would then coordinate the development of the terms of reference for watersheds within the region based on these directions. The Minister would have the authority to allow deviations from these directions should the SPPB offer a sufficiently strong rationale.

Minimum Components in the Terms of Reference

Each terms of reference prepared by an SPPC would have to include, at a minimum, the following:

- a workplan targeted at interim goals and measures to protect immediate threats to drinking water sources, according to requirements set by the Ministry of the Environment;
- a workplan to develop a source water protection assessment that includes an outline of the necessary technical and scientific work required to lay the foundation of the source water protection plan;
- a process for the establishment of watershed sub-committees and working groups;

- a process for obtaining municipal support for the recommended source water protection plan;
- a publicly transparent decision-making and dispute-resolution process;
- a process for the establishment and coordination of local consultation with affected parties on the source water protection plan;
- an estimation of the proposed timeline for the completion of the source water assessment and source water protection plan; and
- an indication of whether watershed areas will be sub-divided or expanded to neighboring watershed areas for the purposes of undertaking assessments or developing source water protection plans.

Consultation on the Proposed Terms of Reference

Source water protection legislation would require that, once a proposed terms of reference is completed, all interested groups (stakeholders and the general public) have substantial opportunity to comment. For example, the SPPC could post a notice in the local newspaper which indicates where residents can view the proposed terms of reference, how comments can be made, and the deadline for comments.

Public input would be considered, and the terms of reference could be revised, before the SPPC forwards the proposed terms of reference to the SPPB for review and approval.

Approving the Terms of Reference

The SPPB would review and approve the terms of reference based on whether or not it satisfies the directions provided by the Ministry of the Environment. The board would be able to require the SPPC to correct any deficiencies. It would then provide a copy of the terms of reference to the Ministry of the Environment.

The Ministry would review the ToR and would have the ability to make comments to the SPPB.

If the Ministry had comments, the SPPB would be required to amend the terms of reference, within a specified period of time, to ensure that it conforms to the Ministry's directions. Then, it would submit the revised ToR to the Ministry. The Ministry of the Environment would also have the authority to amend the ToR, set priorities and include interim outcomes and measures at any time during the planning process.

The SPPB would be responsible for ensuring that a copy of the terms of reference is available upon request to the public.

Assessment report

Sound water resources management decisions depend on understanding the relationship between water quality, water use, and conditions within the watershed. The

most effective protection program will be built on accurate and representative assessments of threats to the water source[9] (see Appendix 2).

Once the ToR was finalized, the SPPC would generate a report that documents the status and characteristics of the water resource in the watershed area, identifies potential sources of contamination and water use issues, and provides other information necessary to develop a source water protection plan.

The 'assessment report' would cover two main topics:

- **A technical assessment of the status of watershed.** The assessment would provide information on existing and prospective water supplies, water use/demand for water in the watershed, and potential sources of contamination and water use issues. The proposed content of the assessment will be set out in regulation (see Appendix 3).

- **The scope/objectives of the SPP.** The SPPC would also undertake a consultative process to develop the scope and objectives of the source water protection plan. This phase of the assessment may be undertaken through a consensus process or a risk-management process at the discretion of the SPPC. Elements of the scope and objectives of the SPP would be outlined in the regulation (see Appendix 4).

For watersheds where a conservation authority is the SPPB, assessment reports would be required for submission to the Ministry over a two-year period. Regulations would set out a schedule for the submission of assessment reports to the Ministry, generally requiring key areas of work to be submitted by all SPPCs within a specified date.

The Minister would be able to, through an order authorized by source water protection legislation, extend the period for completion, whether or not the time previously set has expired.

The early assessments would be followed by more sophisticated comprehensive studies as the process matures, information changes and technology becomes more sophisticated over time.

[9] The work of the Technical Experts Committee that has been established by the government will be done in parallel with the consultation on the White Paper. The results of the Technical Experts Committee's work will inform the development of consistent standards.

Groundwater Studies

Ontario has taken a leadership role in providing support to communities for mapping municipal wellhead protection areas and mapping regional groundwater conditions. Recognizing the importance of this resource to the more than three million Ontarians who rely on private and municipal wells, 97 groundwater studies across Ontario have mapped municipal wellhead protection areas. These studies are being conducted by partnerships of municipalities and conservation authorities.

Information on groundwater resources and potential threats is an important first step in effective source water protection. By the end of 2004, over 95% of Ontario communities that rely on groundwater should have a common base of information on their groundwater resources.

Process for approval of the source water protection assessment

The SPPC would submit the draft assessment report to the SPPB for its review and the Board would review and endorse the assessment based on whether or not it complies with the requirement of the legislation. The SPPB would also be able to request that the SPPC to correct any deficiencies in the assessment.

When the SPPB has endorsed the assessment, the SPPB would provide a copy to the Ministry of the Environment.

The Ministry of the Environment would review the source water protection assessment and would provide comments, as needed, to the SPPB. If the Ministry has comments, the SPPB would be required to amend the assessment, within the period specified by the Minister, to ensure that it conforms to the directions provided by the Ministry and submit a revised report to the Ministry.

Once finalized, the SPPB would be responsible for ensuring that a copy of the assessment is available upon request to the public and also that public meetings are held in order to convey the findings of the assessment to the public.

Source water protection plans

The SPPC would begin development of a source water protection plan (SPP) for the watersheds in its region and coordinate with adjoining areas as appropriate (i.e., where groundwater travels across watershed boundaries). The purpose of the SPP would be to indicate the management actions that are required to protect the quality and quantity of sources of drinking water over the long term.

The development of an SPP would entail evaluating management options based on the ranked hazards identified in the source water protection assessment, prioritizing actions and implementing them. The SPP would then be developed in accordance with the legislation and regulations. (Note that the content of the SPP would be outlined in

detailed regulations and would be based, in part, on the results of the work of the Technical Experts Committee and the Implementation Committee.)

The SPP would include maps, tables and spreadsheets clearly depicting the designation of water resources as follows:

- those drinking water resources under significant and direct threat for immediate actions to reduce the threat;
- drinking water resources for which risk reduction practices must be maintained or phased in;
- future drinking water resources for which action is required either to restore or maintain the water quality and quantity; and
- surface water resources and other water resources (e.g., wetlands, springs, heritage waters) that require remediation or protection.

The SPP would include components such as:

- identification of measures to be taken to address immediate threats to drinking water sources. Examples of measures could include well head protection plan implementation, well decommissioning, clean-ups, land-use changes or modifications, etc;
- a description of the process that will be undertaken to ensure a transparent, broad local consultation process based on requirements set by the Ministry;
- an implementation plan to manage the identified source protection issues, delineate management actions to be undertaken, including those to resolve information gaps and outline including roles and responsibilities, accountability, process, schedule and outputs;
- a monitoring and assessment program including roles and responsibilities, accountability, process, schedule and outputs to fill information gaps and also track the status of management activities;
- a description of how the plan will be reviewed, updated and evaluated including roles and responsibilities, accountability, process schedule and outputs; and
- a description of the manner in which Great Lakes objectives have been taken into consideration and will be furthered;
- a description of outstanding or unresolved issues and how they will be dealt with (these may be addressed through additional data collection, more detailed study and approved analytical tools).

These components may be supplemented by guidelines that would be developed by the province.

Examples of Management Strategies

The following list contains examples of the types of management strategies that may be used in, or leveraged by, a source water protection plan to help achieve the established water quality and quantity objectives that have been set:

- limiting how much water can be taken from sensitive areas;
- linking source water protection objectives to related processes (e.g., official plans, land use planning, zoning, etc);
- supporting farm water protection programs and environmental farm plans;
- introducing protected lands strategies (e.g., easements, land purchases), education, and enforcement measures to preserve and restore water quality and quantity;
- restoring the landscape by, for example, increasing riparian buffers consisting of natural vegetation;
- introducing wellhead protection and discharge reduction programs; and
- introducing incentives that encourage adoption of best management practices that reduce the risk of contamination.

Technical process for source water protection plan development

A risk assessment and management protocol (see Appendix 2 for an outline of a potential approach) would be followed that would result in the recommendations for specific management activities related to source water protection. The risk management activities would identify where activities are needed to restore, maintain and protect surface water and groundwater quality and quantities.

The proposed regulations would set out data quality and default values that would invoke the 'precautionary principle', resulting in the use of a semi-quantitative risk assessment methodology to assessing risks. Assignment of management actions would be specified according to the level of risk derived from the assessment, taking into consideration the data quality and availability.

Consultation on source water protection plans

Commissioner O'Connor stated that the source water protection planning process should be fully transparent to the public. As a result, the SPPC would be required to provide substantial opportunity for input among all affected stakeholders in accordance with their terms of reference.

The SPPC would be required to establish a watershed sub-committee with representation from all municipalities (and other sub-committees to facilitate discussions with other key stakeholders, as required) in the watershed to provide a mechanism for ongoing consultation during plan development. The SPPC would be required to present its work to the watershed committee at critical points during the planning cycle. Work that would have to be presented to the sub-committee(s) includes:

- the Terms of Reference;
- the source water protection assessment report;
- initial draft source water protection plans; and
- source water protection plans before they are submitted to the Ministry of the Environment.

Throughout the planning process, the SPPC, working with the sub-committee(s), would:
- hold meetings that are advertised approximately two weeks in advance, and that are open to the public;
- publish draft source water protection plans widely, informing the public of the place at which a copy of the plan is available, providing adequate time and inviting public comment in writing; and
- document responses to public input, as appropriate.

Public input would be considered before the SPPC forwards the proposed source water protection plan to the SPPB for their review and subsequent recommendation to the Ministry of the Environment.

Approval of source water protection plans

Before implementation, there are a number of levels of approval that would have to be met for source water protection plans (SPP).

Local Approval

- The SPPB would review the draft source water protection plan (SPP) to ensure it conforms to the ToR, lead the dispute resolution process, and make necessary changes as agreed to by municipalities.
- The SPPB, working with the SPPC, would request municipal resolutions in support of the draft plan. The objective would be to achieve supportive resolutions from 100% of municipalities.
- The SPPB would also document any discrepancies between the draft SPP as presented to the Board by the SPPC and the plan which is forwarded to the Ministry of the Environment for approval, including the rationale for any decisions that vary from the SPPC-proposed approach.
- The SPPB would then provide the recommended draft plan to the Ministry for approval including documentation of stakeholder objections as described above.

Provincial Approval

- The Ministry would post the SPP on the Environmental Bill of Rights Registry before being considered for approval by Minister.
- After the public input has been considered, the Ministry would have the authority to approve the SPP in whole or in part, according to the timelines set by the Ministry.

- The Ministry Of Environment would prepare review and approval policies to establish a consistent procedure for approving the SPPs.
- If the Ministry considers any plan to be deficient, it would be able to provide the SPPB with a statement describing the deficiencies and provide a timeline to re-submit the source water protection plan. If an SPP is rejected by the Ministry, in whole or in part, publicly stated reasons must be provided.
- The Ministry would complete its review and make a decision on approval within a specified timeframe once it received the draft recommended plan.

The Ministry would also be responsible for initiating the necessary inter-governmental consultations with those ministries, as well as other levels of government that would be affected by the plan, including the federal government and First Nations.

Timelines for approval of source water protection plans

The legislation would provide the authority for the Ministry to establish timelines and deliverables for source protection planning. Therefore, a schedule for completion of SPPs and its components would be established through an instrument such as regulation, Minister's Order or Terms of Reference for the source water protection plan.

This approach would allow the Ministry the time required to determine plan development, implementation details and resource and capacity-building requirements. It would also allow time to consider any relevant recommendations by the Technical Experts Committee and the Implementation Committee (e.g., capacity development within watersheds is part of the work of the Implementation Committee).

If a SPPC did not produce a draft plan or assessment report that is acceptable to the Ministry within a prescribed time limit, the Ministry would have the authority to take over development of the plan or assessment report or delegate these tasks to another public authority.

Annual progress reports

As recommended by Commissioner O'Connor, the Ministry of the Environment would produce annual progress reports indicating the status of drinking water source water protection plans in each watershed. Since the source water protection plans will be continually evolving, SPPBs would also be expected to provide regular progress reports to the public.

Updating source water protection plans

As land uses, industries and local communities evolve in Ontario, changes will be needed to source water protection plans. In fact, it must be recognized that these plans

will have to be extremely dynamic and flexible enough to respond to changes within the watershed or watershed region and to new information and technology. Updates must be done on an almost continuous basis. Therefore, mechanisms for updating must be developed and incorporated into all plans. It is anticipated that a schedule of reviews both by the SPPC and the Ministry would be established, which may have implications for the review and updating of other planning processes such as official or watershed plans.

This approach would ensure that plans provide the flexibility needed to meet current needs and ensure that future needs are integrated as they arise. It would also ensure that plans make use of the newest scientific methods and watershed data as they become available.

Most importantly, a transparent consultative approach is as important in the updating of a source water protection plan as it is in its initial formulation.

Appeals of source water protection plans

The legislation would provide certain limited rights of appeal to challenge the approval of source water protection plans, consistent with Commissioner O'Connor's recommendations in Part Two of the Report of the Walkerton Inquiry.

For a ministry-approved plan, a limited right of appeal would be available to the Environmental Review Tribunal by persons who are directly affected by the plan. These would include residents in the watershed who made written comments as part of the public consultation process during the development of the plan and any person who could demonstrate that the implementation of the plan would directly and adversely affect their use of property.

On an appeal, the Environmental Review Tribunal would only be authorized to make necessary changes to the plan or to refer the plan back to the SPPB for further consideration, if an appellant could demonstrate that the plan fundamentally fails to comply with the requirements of the legislation, or the plan's terms of reference, including the provision for public consultation established by the terms of reference.

The Planning Process From Start to Finish

The Province will establish the Source Water Protection Planning Boards (SPPB) for each watershed to coordinate the source protection planning process. Where conservation authorities (CAs) exist, the SPPB will be formed by the members of the CA Board, as appointed under the CA Act. The province would make a decision on the members of the SPPB in areas where there are no CAs.

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The SPPBs would be responsible for establishing a multi-stakeholder Source Protection Planning Committee (SPPC) for the watershed region.

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The SPPC would be responsible for overseeing the development of the source water protection plan for each watershed.

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The SPPC, in consultation with the SPPB, would prepare a Terms of Reference (ToR).

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The ToR would confirm the approach that would be taken to obtain municipal support for the draft source water protection plan as demonstrated by municipal council resolutions.

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The SPPC would also be responsible for:

- establishing multi-stakeholder working groups and sub-committees;
- developing a transparent decision and conflict resolution process;
- undertaking technical studies and analyzing results and data;
- consulting broadly to ensure input, particularly from municipalities and key stakeholders such as the agricultural sector; and
- developing a source water protection assessment and draft source water protection plan for the watershed or watersheds in the region.

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Once completed, the SPPC would submit the draft plan to the SPPB for review and endorsement.

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The SPPB would work towards a goal of having resolutions in support of the plan from 100% of municipalities before submitting the plan to the Minister.

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The SPPB would be required to consider any objections to the draft plan and use best efforts to resolve any issues locally, as provided for in the SPPC's ToR.

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Any changes to the plan would have to be presented to each municipal council in the watershed.

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If an issue could not be resolved locally, the SPPB would be required to document objections to the draft plan, the attempts made to resolve the objections locally, and the rationale for the approach included in the draft plan being submitted.

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The SPPB would provide the endorsed draft plan to the Ministry for review and approval.

SECTION 4: IMPROVING THE MANAGEMENT OF WATER TAKINGS

There is a growing interest among municipalities, non-governmental organizations, and the public in how Ontario's water resources are managed to ensure that our supply of water is protected in the long-term. The management of water takings is critical to protecting drinking water sources and for many other purposes, including sustaining the needs of the ecosystem.

Two issues are discussed in this section, both dealing with potential government responses to the growing concerns regarding water quantity. The first issue relates to the approach being taken by the Ministry to its review of the rules and processes associated with water takings, including the 'permit to take water' (PTTW) program. The second provides a preliminary exploration of a framework for how Ontario could charge for water takings.

Current Rules Governing Water Takings

Water takings are governed by the *Ontario Water Resources Act* (OWRA) and the Water Taking and Transfer Regulation (Ontario Regulation 285/99).

The OWRA requires anyone taking more than a total of 50,000 litres of water in a day, with some exceptions, to obtain a Permit from a Director appointed by the Minister. The Director also has the discretionary authority to require a permit for water takings of less than 50,000 litres per day.

Permitted water uses include: municipal, commercial, industrial, and communal water supplies, agricultural irrigation, recreational uses, water bottling, and construction. Specific uses are exempt from the permitting requirement, namely, individual household use, direct watering of livestock and poultry, and water for firefighting.

The Water Taking and Transfer Regulation provides for the conservation, protection and wise use and management of Ontario's waters by prohibiting the bulk transfer of water out of specified water basins, among other protections. This prohibition on the transfer or diversion of bulk water does not apply to water that is used in the water basin to manufacture or produce a product that is then transferred out of the water basin. Also, the prohibition does not apply to water packaged in a container having a volume of 20 litres or less.

Water Takings

The Ministry has been holding discussions on potential changes to the legislative and regulatory framework that governs water takings (i.e., the *Ontario Water Resources Act* and the Water Taking and Transfer Regulation) since April 2003. Discussions have been held with key stakeholders such as the Association of Municipalities of Ontario, Conservation Ontario, farm organizations, and other water users.

The Ministry is building on this consultation with stakeholders and is planning to make further improvements in the areas described below.

Ensuring stakeholder awareness and involvement

The Ministry is committed to providing greater opportunities for public involvement in decisions about water takings by improving the notification mechanisms of the PTTW application process.

Currently, public consultation is undertaken through postings on the Environmental Bill of Rights Registry (EBR). Exceptions include permits issued for less than one year, permits for agricultural irrigation, and permits required in emergency situations. Permit decisions posted on the Registry can be appealed by the applicant (and by a third party with leave of the Environmental Review Tribunal). Direct municipal and conservation authority notifications occur where the local agency has made a specific request. A Director also can request that an applicant consult with other persons who have an interest in the taking, including governmental authorities for other jurisdictions.

Improvements already proposed include requiring those making the application for a PTTW to provide enhanced notification of interested parties through increased landowner contacts and notice to municipalities and conservation authorities. Stakeholders responded by recommending that this aspect of the application process be strengthened even further.

As a result, the Ministry is proposing the following additional improvements:

- ensuring that the notification process would enable interested parties to receive early and regular notification by the Ministry; and
- increasing the responsibility of permit applicants to address concerns of the public, where there is a sufficient level of interest in the proposal. For example, the applicant could be required to undertake additional consultation activities to address public concerns about a water taking.

Improving Water Management Science through Research

The Ministry is committed to improving the science that underlies our understanding of the consequences of water taking on local water supplies, the ecosystem, and other users in a watershed through research partnerships.

The Ministry will consult on the development and application of methods to calculate water budgets. Water budgets calculate and compare the cumulative annual water flow into an area (e.g., precipitation, surface water, groundwater) with the cumulative annual flow out of the same area (e.g., evapotranspiration, surface water and groundwater).

The planned consultation will focus on water budgeting at two different scales:

- at the level of the watershed; and
- at smaller scales to assist with the assessment of one or more specific water takings.

The expected outcome would be the development of rules to determine at what scale a water budget is required depending on the features of the watershed, as well as the amount and type of water taking.

In addition, there are other areas in which the Ministry's research partnerships are making significant contributions. For example, the Ministry is funding scientific research to increase our understanding of the relationship between water flow and aquatic ecosystems in ways that will improve our ability to assess the potential environmental impacts of water takings. There are several methods being used in other jurisdictions, but these have not yet been tested or validated for their use in Ontario.

Currently, the Ministry, in partnership with Conservation Ontario, is testing new methods for setting minimum stream flows necessary to protect the natural functions of ecosystems. The project is designed to address the need for a standardized approach to setting threshold flows for surface waters in Ontario. Once we know more, the Ministry expects to prepare supporting materials on acceptable methods for assessing impacts and establish the criteria for when instream flow will be required to be considered in the PTTW process.

Future areas of research could include better defining the relationship of groundwater to surface water, investigating links between water quality models and flow regimes, and improving the science of impacts to wetlands.

Monitoring and Reporting of Water Use

Monitoring and reporting information is required to ensure the sustainability of water takings and the integrity of aquatic systems, and to supply data for water budgets, cumulative impact assessment, and the Ontario Low Water Response Program.

Many PTTW permit holders currently monitor their takings and report them at the expiry of their permit. However, there is no database containing the actual amounts of water

taken by permit holders. Consequently, a number of stakeholders have pointed out the need for mandatory monitoring and reporting.

In response, the Ministry funded a pilot project with Conservation Ontario, Quinte Conservation Authority and Long Point Region Conservation Authority to assess the technical issues involved in establishing a consistent monitoring and reporting system.

The findings of this pilot project will guide the Ministry as it considers how to develop a monitoring and reporting system that could be applied province-wide.

Very preliminary considerations that would inform any province-wide monitoring and reporting systems include the need to:

- recognize the different levels of capability and experience in monitoring and reporting water takings of different parties (e.g., by phasing-in any requirements). Municipalities, for example, already carry out these activities, whereas other takers would require education and training in order to meet such requirements;
- provide a guidance manual to assist permit holders in improving the accuracy of their monitoring systems;
- identify the key factors that would determine the frequency of reporting and accuracy of monitoring such as the environmental conditions of the watershed and the type of water taking (e.g., users not returning water to the watershed); and
- create a comprehensive, user-friendly, publicly accessible database to house the water taking data.

Enhancing Guidance for Permit Applicants and Reviewers

Stakeholders have identified the need to improve the rules and procedures used to review and make decisions on permit applications.

To respond to this concern, the Ministry is committed to updating the *Permits to Take Water: Guidelines and Procedures Manual*. The updated manual will provide clearer guidance for permit applicants and reviewers on the required level of review for different types of permits. The Ministry will relate specific rules and procedures to considerations such as the type of water taking, conditions in the watershed, and the interests of potentially affected parties in the taking.

The Ministry is planning to post an updated "Permits to Take Water, Guidelines and Procedures Manual" in conjunction with related PTTW regulatory and program improvements for public review and comment.

Promoting Water Use Efficiency and Conservation

As pressures on water resources increase from human uses and changing environmental conditions, so does the importance of water conservation and water efficiency. The Ministry is committed to promoting best conservation practices by all water takers.

The Ministry is seeking input on where there may be opportunities for promotion of efficient use and conservation in the PTTW process (when permits are granted or renewed). For example, there may be value in exploring the benefits of:

- voluntary commitments by permit holders;
- third party certification of proposed water conservation measures; and
- basic education and outreach.

Water Taking Charges

On December 18, 2003 the government announced its intent to apply charges to water takings that remove water from the watershed for commercial purposes. This would be the first time that charges for water takings would be applied in Ontario.

A provincial water taking charge would complement improvements to the Permit to Take Water program, discussed above, ensuring that the impact of water takings is regulated in a way that is consistent with environmental considerations and the needs of all those who rely on and benefit from this resource. The framework would also be consistent with Ontario's overall approach to source water protection and the overarching objective of protecting human health. The government is proceeding carefully with the introduction of charges for water takings, given the potential trade implications and the need to promote a strong economy in Ontario and be competitive with other jurisdictions.

The input received in response to the White Paper will be considered as the province acts to ensure that those who benefit from Ontario's water resources pay their fair share to protect and manage it for future generations.

Water charges in other jurisdictions

Many jurisdictions, including most Canadian provinces, charge a fee for a permit or license to withdraw water above a certain volume. The charge structures vary but can include both a fixed administrative fee and an additional annual charge based on the volume of water used. Typically, different fees are charged for different types of water use (e.g., industrial versus agricultural) and, in many cases, some water users are exempt from the charge. Examples from two jurisdictions follow.

British Columbia

Water licenses are issued by Land and Water British Columbia for all surface water withdrawals in the province. There are currently over 43,000 water licenses for 90 different water taking purposes. Water withdrawn for domestic purposes, mineral processing, and fire fighting are exempt from the licensing requirement.

British Columbia has had water taking charges since the 1930s. The current charging framework includes a one-time license application fee and an annual volume-based water rental fee. The license application fees range from $100 to $10,000, depending on the purpose of the taking and the volume of the requested withdrawal. Each year, approximately 300 - 400 new license applications generate $450,000.

The rental rate varies according to the purpose of the water taking and is multiplied by the volume of water allocated in the license to determine the annual charge. The annual water rental charge ranges from $11 to more than $5,000. The revenue from the water rental charges is approximately $6 million per year, not including charges to the power generation sector.

All revenue generated from water taking charges in British Columbia, with the exception of revenue from the power generation sector, is retained by Land and Water British Columbia to fund its programs.

United Kingdom

In England and Wales, licenses are issued by the U.K. Environment Agency for most ground and surface water takings, or abstractions. Exemptions from licensing include small withdrawals (i.e., <20,000 L/day) for domestic purposes, as well as for de-watering, fire fighting, and certain agricultural uses (e.g., spray irrigation is not exempt).

In the U.K., charges are also applied to licensed water abstractions. The current framework has been in place since 1993 and includes both an application fee of approximately $250 (CAD) and an annual charge. The annual charge is calculated according to the licensed volume of the taking, the source of the taking, and the type of taking (i.e., consumptive vs. non-consumptive).

Annual revenue from water taking charges in the U.K. is approximately $250 million (CAD) and is used to fund all of the Water Agency's water resources management activities, including measurement, licensing and resource protection.

Considerations for water taking charges in Ontario

Examining the approaches taken by other jurisdictions to water charging highlights a number of considerations that could inform the design of a system appropriate for

Ontario. Key principles that could guide the development of a provincial water taking charges framework are:

- promoting water resource protection through efficient use and conservation;
- ensuring fairness, equity, and transparency for permitted water users and other stakeholders, including the people of Ontario; and
- applying user charges to permitted water takers that can contribute to the costs of managing a sustainable and healthy supply of water in Ontario.

In addition to these principles, there are several factors that need to be considered when designing a system of water taking charges. These key factors are discussed briefly below.

Charge variability

A water taking charge could be fixed for all permitted users, or graduated according to factors such as the characteristics of the water taking, the purpose of the water taking, or conditions in the watershed.

- *Volume*: There is high variability in the volumes of permitted water takings in Ontario. Permits are required for most water takings greater than 50,000 litres per day. There are, however, more than 200 existing permits that permit the withdrawal of more than 20 million litres per day.

  A volume-based charge could reflect these tremendous differences between water users. Charges could apply to the permitted volume of the taking or the actual amount of water taking. Charging based on the permitted volume may penalize certain users that take less than their permitted amount in a given year. Charging for actual water taking would require permit holders to monitor (e.g., metering or estimating) and periodically report the volume of their water taking.

- *Consumptive use*: Consumptive use refers to the portion of a surface or ground water withdrawal that is not returned (within a relatively short time frame) to the water source from which it was taken. Consumptive uses or losses cause concern when they interfere with the interests of other users sharing the resource or threaten ecological functions that underlie the health of aquatic ecosystems.

Consumptive use could be integrated into a charging system. Water users that permanently remove water from the local watershed could be charged. This would mean that those companies that incorporate a significant portion of water into their end products could pay for their water withdrawals.

- *Source*: The source of the water taking could be another factor used in determining a water taking charge. For example, different charges could apply to surface water and groundwater sources.

  Also, watersheds in Ontario are under different degrees of stress due to their location, levels of urban growth, and type of land use. With adequate information on

cumulative water use and water availability (e.g., a water budget model), charges could vary according to the location of the taking to reflect these different watershed conditions. These could include previous or existing water quantity pressures and the degree of need for remedial actions within the area of the proposed taking.

Exemption

In many jurisdictions, uses such as drinking water, fire protection, mineral processing, agriculture and conservation are exempt from a water taking charge. In Ontario, similar exemptions could be made for water takings.

Frequency

The frequency of payment of a water taking charge raises considerations for fairness among future and existing permitted water takers.

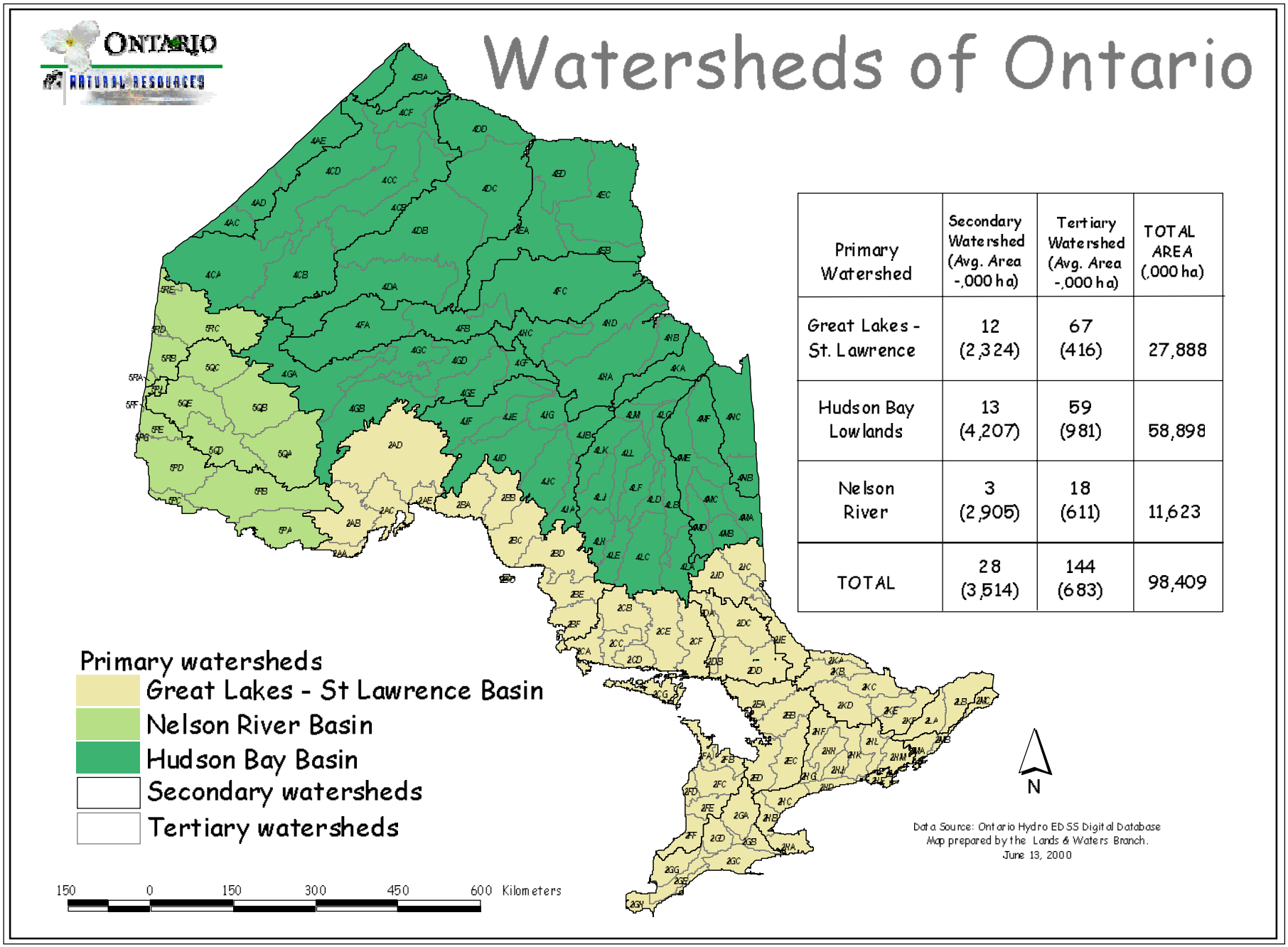
Water users could pay a one-time charge on issuance or renewal of their permits. Given that permits are issued for varying lengths of time, certain water users would be charged more frequently. To deal with this inequity, a one-time charge could be pro-rated, according to the duration of the permit.

Alternatively, regular, periodic (e.g., annual) charges could be applied to new and existing permitted users. All water takers, regardless of the duration of their permits, could be charged at the same frequency.

Next steps

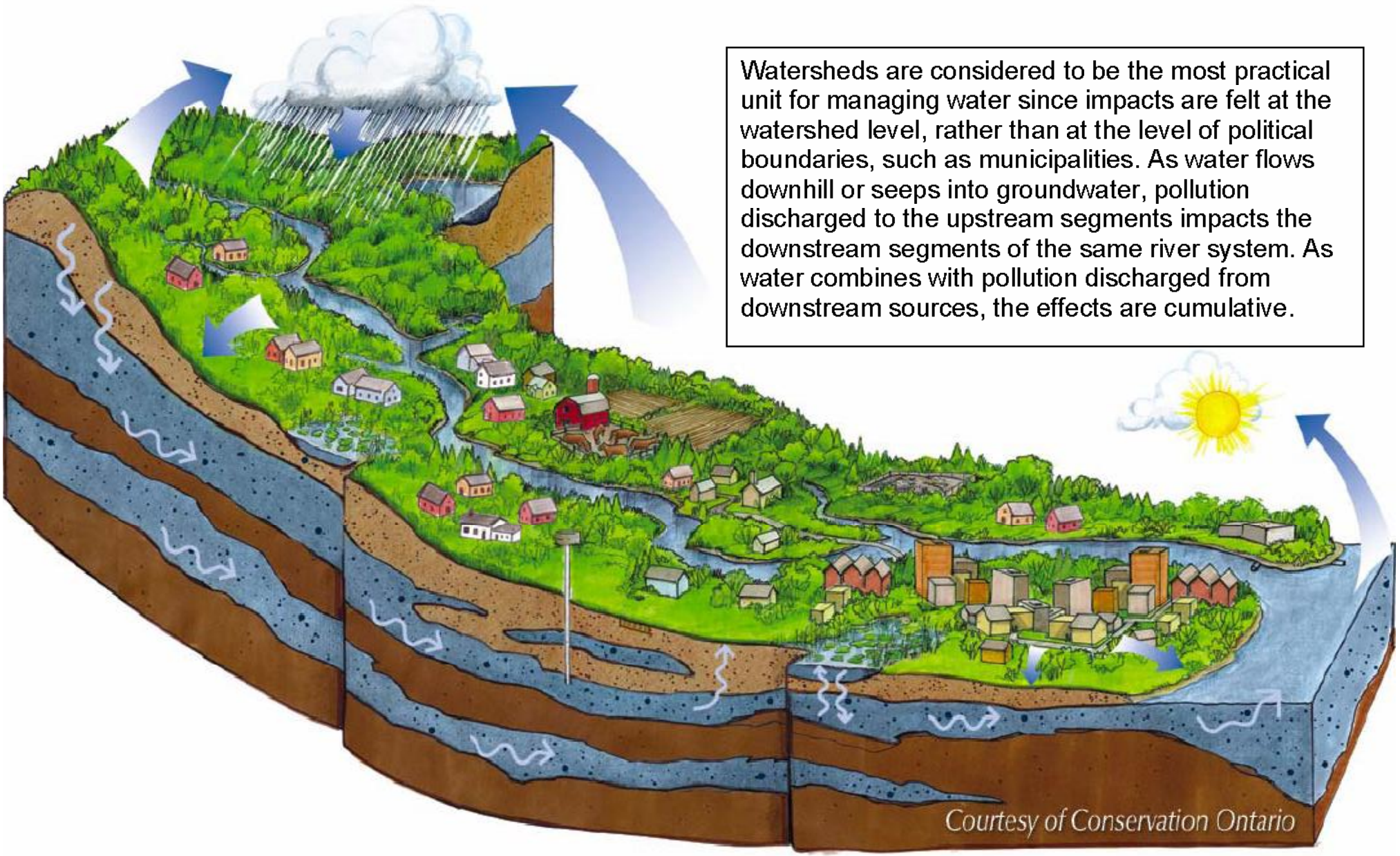
Following early consultations with the public and stakeholders, a proposed framework for water taking charges will be brought forward in spring 2004.

APPENDIX 1 – FIGURE #1



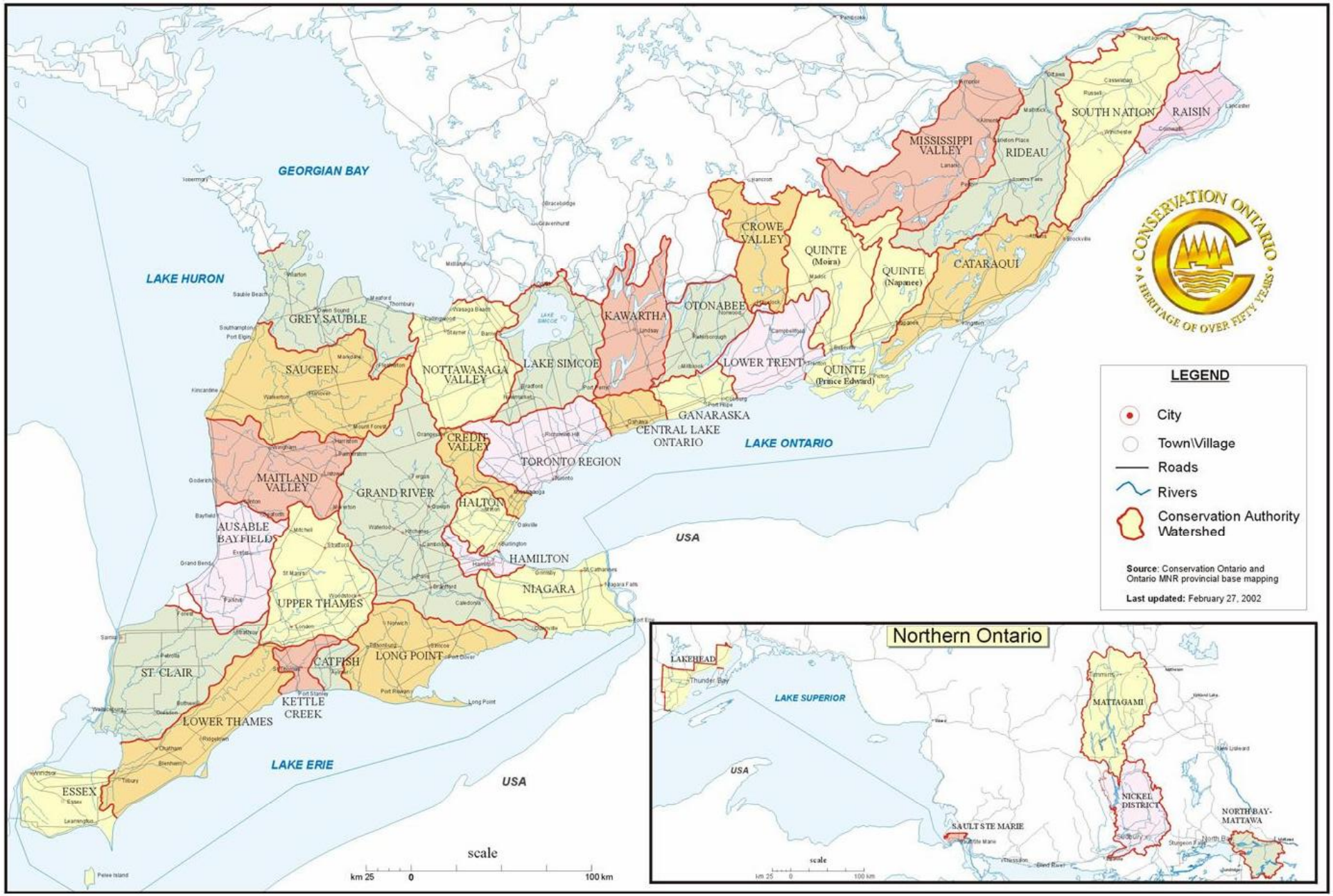
Primary Watershed	Secondary Watershed (Avg. Area -,000 ha)	Tertiary Watershed (Avg. Area -,000 ha)	TOTAL AREA (,000 ha)
Great Lakes - St. Lawrence	12 (2,324)	67 (416)	27,888
Hudson Bay Lowlands	13 (4,207)	59 (981)	58,898
Nelson River	3 (2,905)	18 (611)	11,623
TOTAL	28 (3,514)	144 (683)	98,409

APPENDIX 1 - FIGURE #2: WATER MANAGEMENT AT THE WATERSHED LEVEL



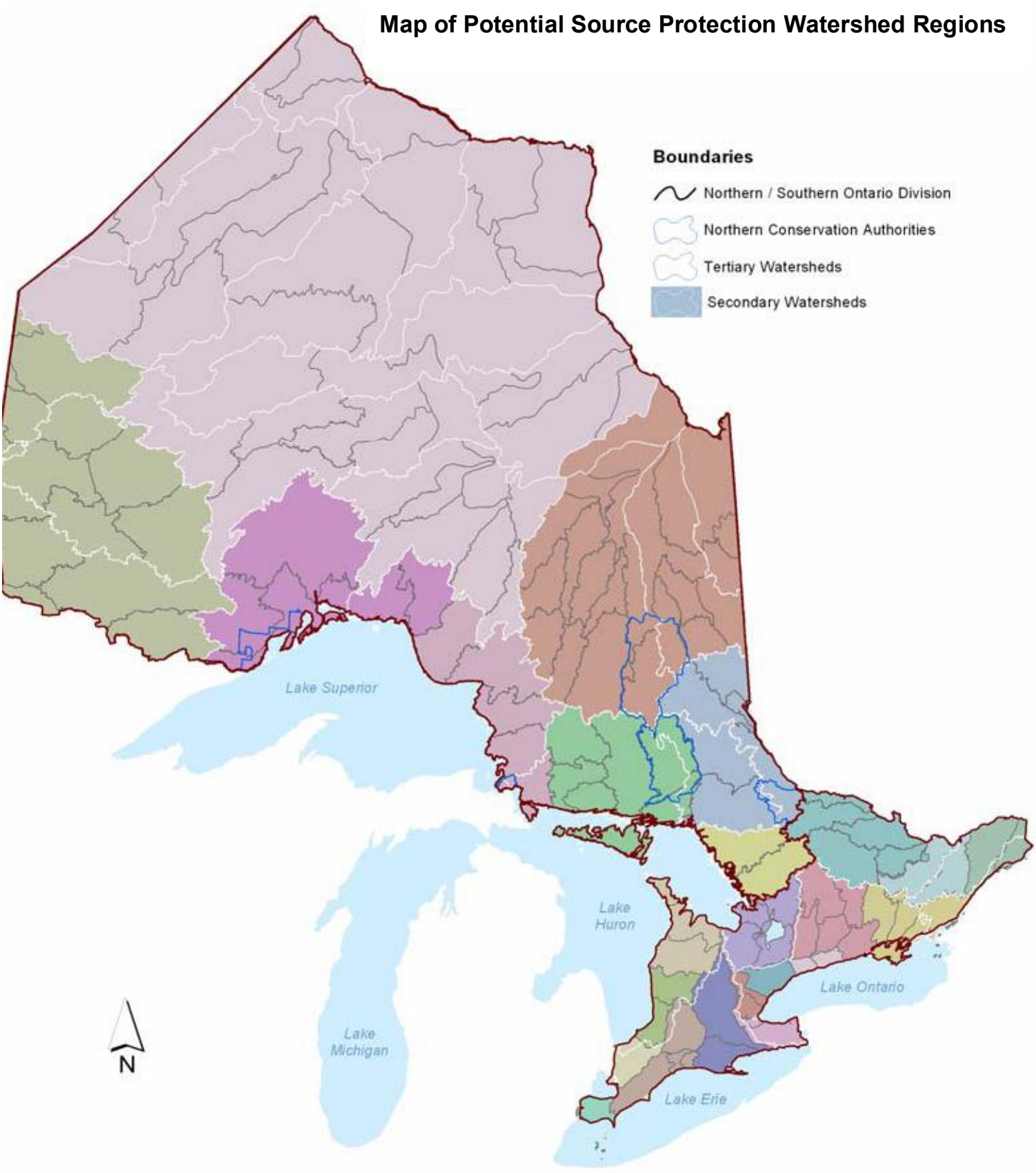
Watersheds are considered to be the most practical unit for managing water since impacts are felt at the watershed level, rather than at the level of political boundaries, such as municipalities. As water flows downhill or seeps into groundwater, pollution discharged to the upstream segments impacts the downstream segments of the same river system. As water combines with pollution discharged from downstream sources, the effects are cumulative.

APPENDIX 1 - FIGURE #3: MAP OF CONSERVATION AUTHORITIES IN ONTARIO

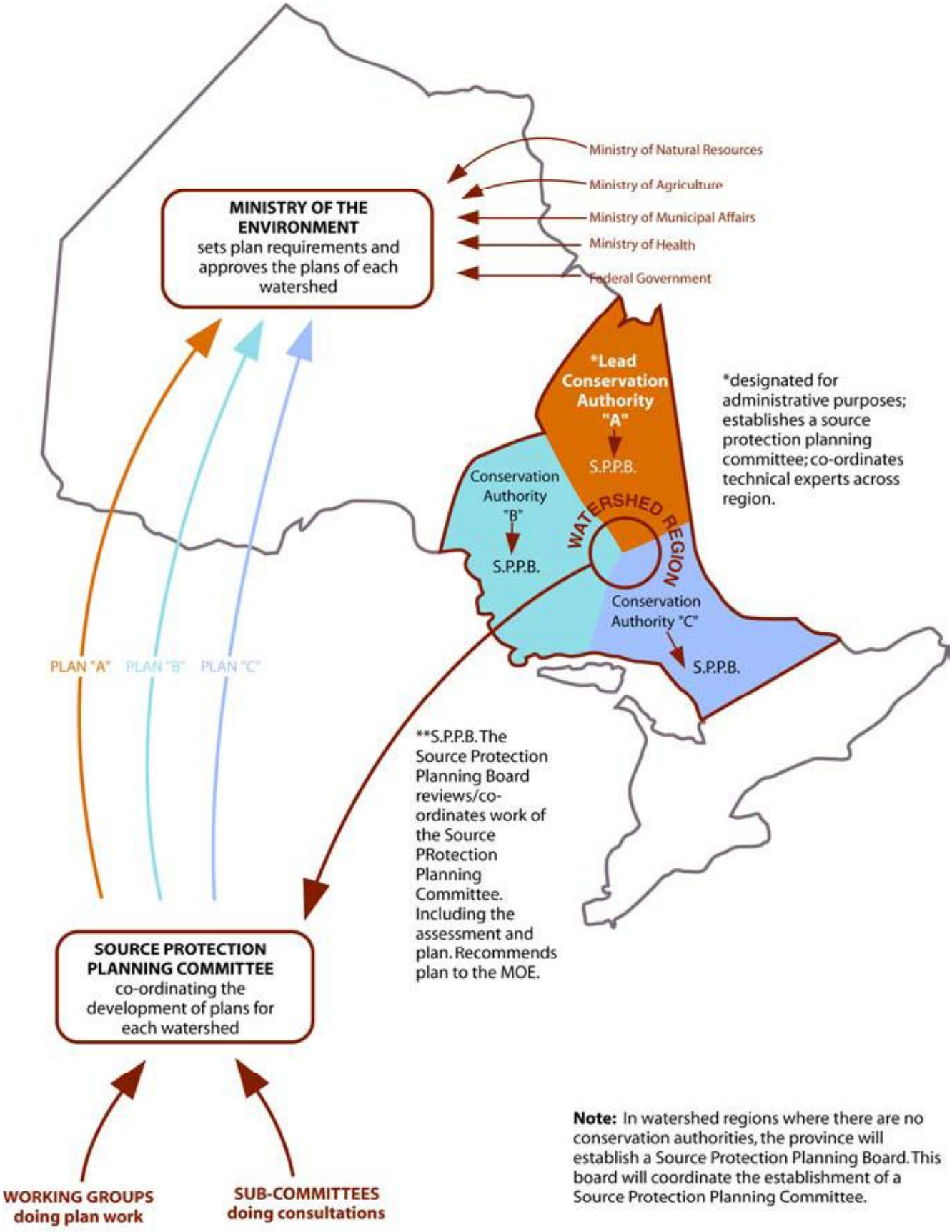


APPENDIX 1 - FIGURE #4

Map of Potential Source Protection Watershed Regions



APPENDIX 1 - FIGURE #5
SOURCE PROTECTION PLANNING: GOVERNANCE STRUCTURE



APPENDIX 1 - FIGURE #6: PROPOSED SOURCE PROTECTION PLANNING PROCESS

CONSULTATION

PLANNING STAGE	ELEMENT OF PLANNING PROCESS	DESCRIPTION
ESTABLISHING AN ORGANIZATIONAL STRUCTURE	**Source Protection Planning Board (SPPB)**	The primary responsibility of the SPPB is to coordinate/review the work of the SPPC. SPPB is the local Conservation Authority (CA) board where CAs exist. The province will designate an SPPB where no CA is present.
	Source Protection Planning Committee (SPPC)	The SPPB will establish a SPPC, comprised of local stakeholders. SPPCs will coordinate the development of source protection plan (or plans) for the watershed region.
	Working Groups	SPPC will establish working groups to undertake work to develop a plan, e.g. technical studies of watershed resources. Working groups will be comprised of representatives from CAs, municipalities, the province, and other local stakeholders with expertise.
DEVELOPING A SOURCE PROTECTION PLAN	**Technical Assessment**	Provide information on existing and prospective water supplies, water use/demand for water in the watershed, and potential sources of contamination.
	Interim Management Strategies	Identification of measures to be taken as soon as possible, to address immediate threats to drinking water sources. Examples of measures could include, well head protection, well decommissioning, clean-ups, etc.
	Threat Assessment & Development of Management Strategies	Evaluate management options based on the ranked hazards identified using information from the technical assessment, prioritizing actions and implementing them.
	Source Protection Plan	Identify management actions that will be undertaken to protect the quality and quantity of sources of drinking water over the near and the long term.
	Approval of Plan	Local approval: SPPB, working with SPPC, would request municipal resolutions in support of draft plan. The objective would be to achieve supportive resolutions from 100% of municipalities. Provincial approval: SPPB forwards draft plan to the Ministry of the Environment for final approval. The plan will be posted on the EBR prior to being considered by Minister.
MONITORING & UPDATING	**Monitoring**	A monitoring program will be implemented to ensure the effectiveness source protection plan.
	Update	As land uses, industries and local communities evolve in Ontario, changes will be needed to source water protection plans, updates will need to be done on a continuous basis.

APPENDIX 2: PROPOSED MANDATORY FRAMEWORK FOR THE THREATS ASSESSMENT PROCESS

The details of this process would be informed by the work of the Technical Experts Committee. One potential approach contains the following sequential steps:

1. Scope and objectives set during the assessment phase.

2. Threats inventory and analysis – this is anticipated to be "generic" and conservative so as to be consistent with the precautionary principle, and will include descriptors for data reliability and confidence, resulting in a ranking of threats from high to low.

3. Water resource sensitivity analysis – identification of how individual water resources may respond (generic) if a threat becomes an impact, including descriptors of analysis reliability and confidence, resulting in a numeric ranking of sensitivity.

4. Vulnerability analysis – identification of the likelihood of specific threats impinging upon the water resource, including proximity and pathway analysis and reliability and confidence analysis, resulting in a numeric ranking of vulnerability.

5. Risk analysis compilation – summarization of the threats, sensitivity and vulnerability analysis to result in a compiled listing of relative "risk" including "confidence descriptors" derived from data reliability and confidence compilations.

6. Values analysis – review of ranking summaries to identify water resources that are threatened that have current or prospective use, or may be of high value to the SPPC, so as to concentrate planning activities upon highly valued water resources,. This would also incorporate into the risk ranking threats to other water uses, including heritage, fisheries, wetlands, etc, for which a semi-quantitative risk assessment approach may not be applicable.

7. Ranking of water resources under threat for subsequent detailed site-specific analysis, utilizing a conservative (precautionary) approach when considering data uncertainty.

8. Repeat Steps 2-7 using site-specific models and ground-truthed information about threats, loadings, discharges, sensitivity, vulnerability including the ability to document the existence and compliance of "best practices" or other risk mitigation measures that will if maintained, substantially reduce the threat.

9. Designation of water resources as follows:
   - drinking water resources under significant and direct threat for immediate actions to reduce the threat;
   - drinking water resources for which current risk reduction practices must be maintained;
   - future drinking water resources for which action is required either to restore or maintain the water quality and quantity; and
   - surface water resources and other water resources (wetlands, springs, heritage waters) that require remediation or protection.

10. Delineation of management actions to be undertaken, including those to resolve information gaps and pursue a monitoring program

APPENDIX 3: PROPOSED CONTENT OF A SOURCE WATER PROTECTION ASSESSMENT

The content of the source water protection assessment would be set in regulation, and could include:

- objectives and priorities of the source water protection plan;
- generalized maps of current land uses (scale of 1:50,000) including land-use designations as the principle designation of land-use business including large and small industry, residential, urban, agricultural and protected (parks, conservation easements)specific maps designating and outlining current plans for projected development including type of development, timeframes and plans for provision of water to the current developments as outlined in current Official Plans for the area;
- water use inventories including groundwater takings including private, communal and municipal drinking water supplies as well as industrial, commercial and agricultural water takings) as well as delineation of areas experiencing stress due to water taking presently;
- significant hydrologic features including groundwater discharges(to surface waters), known recharge and wetland areas, and groundwater supplies under the influence of surface water;
- known areas of water contamination (surface and groundwater), as well as designated high-risk land uses;
- a tentative/provisional water budget for the watershed;
- identification of areas vulnerable to contamination;
- identification of historical potential contaminants;
- identification/decommissioning of abandoned or poorly constructed wells;
- identification of existing wellhead protection areas, including risk reduction measures being undertaken;
- identification of potential contaminant sources that have been undertaken in the past, such as through municipal groundwater studies or equivalent initiatives;
- details of existing water rate schedules; and
- preliminary analysis of water quality including both surface water (compared to PWQO's) and groundwater (compared to ODWS) highlighting areas in which chemical contamination currently appears to constrain current use as a raw water source for drinking water and where current contaminant levels in lakes and streams may be impairing ecological function or impairing beneficial uses as defined by the SPPC.

An inventory and analysis of high risk activities including:

- hazardous, municipal and private land-fill sites;
- known locations of groundwater contamination with industrial byproducts;
- brownfields and abandoned sites;
- direct industrial and municipal discharges to surface waters;
- stormwater discharges and infiltration lagoons/ponds;
- septic fields and cemeteries; and
- uncovered road-salt piles and snow dumps.

Where Groundwater Studies have been undertaken and Wellhead Protection Areas designated the Assessment Report will outline:

- documented threats to drinking water;
- existing control or prevention initiatives;
- evaluations of additional initiatives that could be utilized or explored as part of the Source Water Protection Plan;
- monitoring and information needs highlighted by existing studies which, if addressed, can improve the quality of the subsequent SPP; and
- designations of existing groundwater supplies for which remediation activities are necessary so as to obtain contaminant levels consistent with the ODWS and sufficient water quantities where apparently impaired by adjacent water takings.

APPENDIX 4: SCOPE AND OBJECTIVES OF THE SOURCE WATER PROTECTION PLAN

The scope and objectives, which must be outlined within the context of the assessment report, would be set in regulation and could require:

- definition of a long-term vision for water in the watershed, including drinking water provision and protection of ecological function and valued components of the ecosystem of heritage or commercial/sport interest to be supplied as a projected water budget at regular intervals including allocation of water to major uses in the watershed;
- protection of communal and private ground-water supplies by taking action to prevent contaminant levels from exceeding the DWS where such water shall be used as a source of drinking water as noted in the Vision;
- protection of municipal ground-water supplies by taking action to prevent contaminant levels from exceeding the DWS where such water shall be used as a source of drinking water as noted in the Vision;
- where new supplies of water shall be used as a source of drinking water as noted in the Vision, plans for the protection of these supplies at current levels of quality and quantity;
- restoration of contaminated water supplies (surface and groundwater) that may be used for drinking water supplies in the long term vision plan to be timed coincident with the projected requirement for these water supplies;
- restoration and protection of significant surface water supplies determined to be important to the SPPC such as important fisheries, wetlands, heritage or cultural areas;
- identification of planning and growth opportunities that take into regard water protection strategies;
- a role for protected lands strategies (easements, purchases), education, regulation and incentives in the protection and restoration of water quality and quantity;
- an estimate for any increased need for ‘out-of-basin’ water supplies such as may be provided from the Great Lakes and transported inland for distribution; and
- delineation of groundwater supplies that cross surface-watershed boundaries and a proposal for joint management of these supplies with the responsible authority.

APPENDIX 5: POTENTIAL QUESTIONS FOR THE REGIONAL STAKEHOLDER CONSULTATIONS

Source Water Protection

1. Source water protection is a complex undertaking. What is the best approach to ensuring that the process is open to input from those it may affect?

2. Should any changes to the scope of source water protection legislation be made (provide details)?

3. To make sure that source water protection legislation can achieve its objective – the protection of public health – should there be a specific primacy provision in the legislation (i.e., primacy means that the law would take priority over other laws when there is conflict)?

4. What are the advantages and disadvantages of this proposed approach to source water protection?

5. What mechanisms would help the Source Protection Planning Committee to effectively manage the process, set priorities and reach timely conclusion to the planning process?

6. Is the proposed composition of the Source Protection Planning Committee appropriate (why or why not)?

7. Partnerships will be a key success factor in the development of source water protection plans and in their implementation. How can the process build on existing partnerships that support source water protection-related activities? What is the best way to facilitate new partnerships that may be needed?

8. How can source protection planning best achieve a balance between achieving some consistency across the province and the need for flexibility to deal appropriately with local conditions and priorities?

9. What criteria should the Ministry of the Environment use to decide whether to approve a source water protection plan?

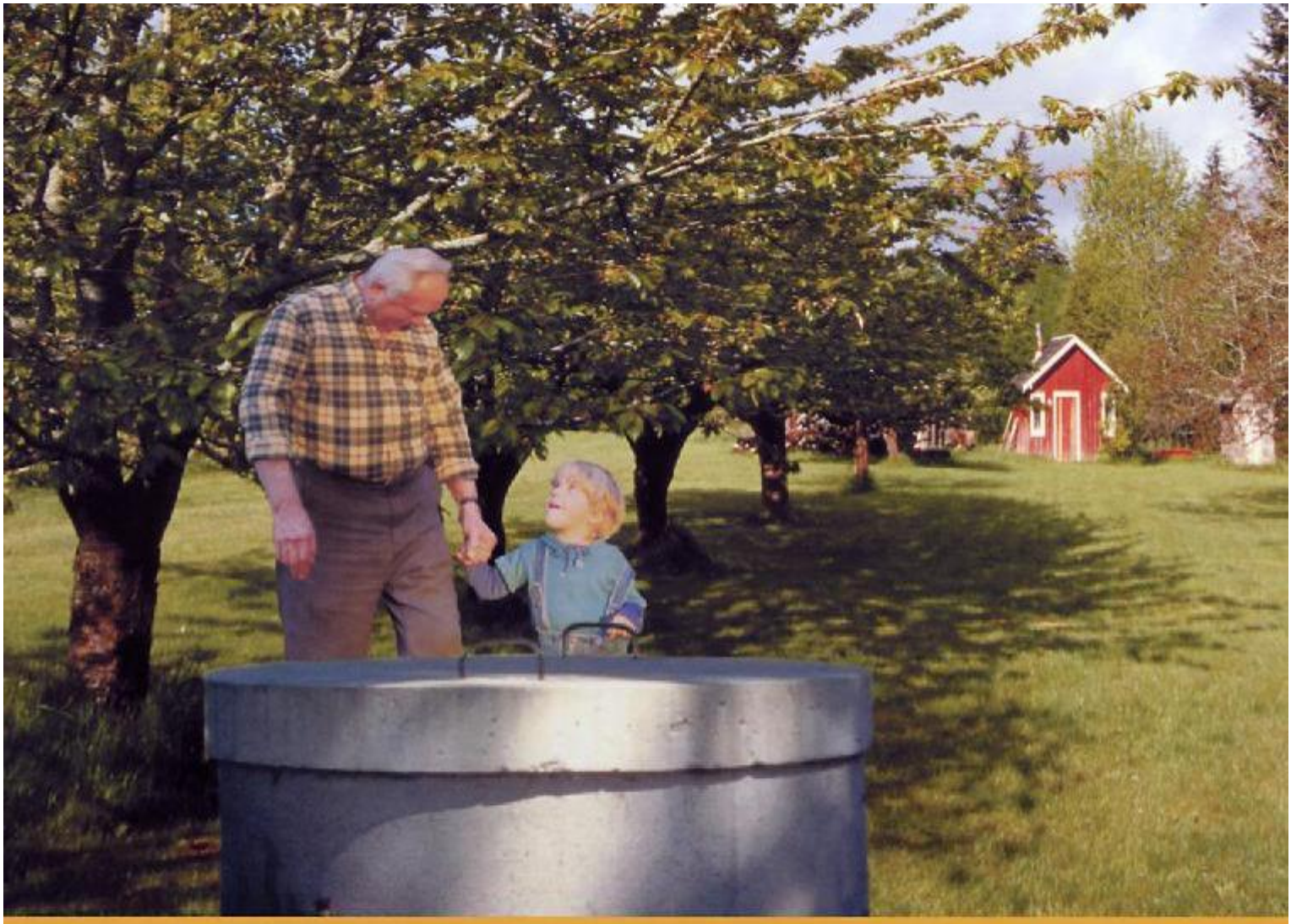
10. Are there specific improvements that you would make to the proposed source water protection assessment or planning process?

11. What should happen if a source water protection plan is not completed in a timely way (e.g., fails to meet timelines as set out in regulations)?

Water Taking Charges

12. Should water taking charges be fixed for all users, or scaled according to factors related to the taking, such as volume, consumption, or water source?

13. Should certain purposes of water taking be exempt from a charge?



Keeping Your Well Water Safe to Drink

An Information Kit to Help You Care for Your Well.

Ontario's Clean Water Strategy - Part of the Ontario Government Plan for Clean Water.

Ontario

Guidelines for Well Owners

Below is a list of what to do, and what not to do, as an owner of a private well in Ontario.

The accompanying Information Sheets provide background information on each one of these guidelines. Read all four – it won't take long and it will be time "well" spent! And if you want more in-depth information, there's lots of that too, in print, at local agency offices and on the Internet. Please see the For More Information section.

What to do

- Make sure your well is properly constructed and maintained – it's your first line of defence to safeguard your drinking water from contaminants and pathogens.
- Inspect your well at least once a year to see what repairs may be needed.
- Make sure your drinking water meets the Ontario Drinking Water Standards, no matter what type of well you have – the only way to know is to have it tested.
- Have a sample of your well water tested at least three times a year.
- Testing for bacteria in well water samples is offered as a service to owners and users of private wells by the Ministry of Health and Long-Term Care.
- Sample bottles are available from public health laboratories and local public health units.
- Get a list of accredited laboratories that can test your water for specific chemical contaminants. Contact your local office of the Ontario Ministry of the Environment, or the MOE Web site.
- Disinfect all wells prior to use with a concentration of 50 milligrams of chlorine per litre of water standing for at least 12 hours.
- Refer to the Disinfection Instruction Sheet that is part of this Information Sheet series.
- Get a copy of the Water Well Record that was filed after the well on your property was built.
- If you don't have a copy, contact the Ministry of the Environment.
- Properly plug and seal unused wells to prevent rapid movement of contaminants down into groundwater.
- Dispose of household hazardous materials properly, pump out your septic tank every two years, and plan on replacing your septic system leaching bed every 20 to 25 years.
- If you need to treat your water, select a treatment system with great care to ensure it will be effective in your particular situation.

What not to do!

- Never use untreated surface water for drinking water – untreated surface water is considered unsafe for human consumption!
- Don't pour water into a well with a low water level – this will undermine the foundation of the well.
- Don't use a highly vulnerable water supply (see Information Sheet, *Get Acquainted with Your Well*) unless all other attempts to develop an alternative supply have been unsuccessful.

Ontario

Information Sheets for Ontario's Private Well Owner

Keeping You "Well" Informed

Ontario now has the toughest standards and protocols for drinking water in North America. If your family's drinking water is supplied by a well on your property, you need to do all you can to make sure the water is safe, now and for years to come.

As the owner of a private well, you are required by regulation and are responsible for keeping it maintained, ensuring that nothing gets into your well that could contaminate your water source.

Groundwater is a shared resource that crosses property lines. Contamination from one well can put other wells at risk. By being vigilant about your well, you're protecting your family and everyone else who draws from the same groundwater. Proper maintenance of your well, regular water testing and being "well" informed are the best defence for the quality of both your water supply and the groundwater it comes from.

You're also responsible for getting your well water tested regularly – at least three times per year is recommended. That way, you can be confident that what you're drinking is free from bacteria and other contaminants.

A series of four Information Sheets and a Disinfection Instruction Sheet is enclosed to outline what you should do as a well owner. Here's what each covers:

Information Sheet, Putting Your Well Water to the Test

- reasons for getting your water tested
- the right way to get a sample of your water for testing
- what happens to your sample at the laboratory
- how to interpret your sample results
- when and how to get your water tested
- what to do if you have a positive "indicator bacteria" result

Information Sheet, Get Acquainted with Your Well

- different types of wells, their construction and maintenance
- water supplies, and how some are more vulnerable to contamination than others
- a well safety checklist

Information Sheet, Pathogens and Your Well Water

- harmful organisms (pathogens) that can get into your well water and affect your health
- testing for "indicator bacteria" – what the term means and what it can tell you about your water

Information Sheet, Choosing a Water Treatment System

- when you may need to treat your water supply
- water treatment options
- common well water quality concerns

Disinfection Instruction Sheet

- a step-by-step approach to disinfecting your well

At the end of each Information Sheet, you'll find Web site links, phone numbers and publications for more information.

Ontario

Pathogens and Your Well Water

What's in your well's water, besides water?

Only test results that are carried out by the public health laboratory or a private laboratory can tell you for sure.

When you submit your well water to the public health laboratory or a private laboratory for testing, it will be analyzed for the presence of "pathogens." Pathogens are organisms that cause illness in humans. When it comes to well water, pathogens of concern include certain forms of bacteria, protozoa and viruses. While each of these organisms can lead to different illnesses of varying severity, there are some very unpleasant symptoms common to many, including diarrhoea, nausea, abdominal cramps and low-grade fevers.

Here's the take-home message: your well is your first line of defence against harmful organisms reaching your water supply. Maintain your well regularly and thoroughly – it's easier to prevent problems than to fix them. To complete your well water safety routine, get your water tested regularly.

Three uninvited guests: bacteria, protozoa, and viruses

Bacteria are a natural part of life. In fact, there are many forms and functions of bacteria we couldn't live without, such as those that break down organic matter (e.g., food waste, leaves).

Water is a preferred environment for bacteria because their membranes could otherwise dry out. But some bacteria in water can lead to serious illness or disease, such as gastroenteritis or salmonellosis. These days, *E. coli* O157:H7 is probably the most infamous disease-causing bacteria.

Some protozoa can live in animals and humans, and are passed in feces. These tiny parasites are able to survive in surface water for long periods of time as dormant cysts. Some waterborne protozoa can cause illness, such as giardiasis or cryptosporidiosis.

Viruses reproduce by infecting living cells. Some viruses found in water cause illness, including Hepatitis A and the Norwalk virus.

Protozoa and viruses are usually found only in surface water that has been contaminated by animal or human feces. However, groundwater can become contaminated through contact with surface water. In other words, if surface water can penetrate any unsealed joint or crack anywhere in your well, your water is at risk.

More about *E. coli*

The most harmful pathogen is *Escherichia coli* (or *E. coli*) O157:H7. It's spread through contaminated food (such as undercooked hamburger) and water. Symptoms may include stomach cramps, vomiting, fever and diarrhoea. Severe cases can progress to kidney failure in the elderly and children. Early symptoms are common to a number of diseases, and may or may not be the result of contaminated drinking water. Contact your doctor for more information.

Although *E. coli* O157:H7 can cause serious illness, most of the other hundreds of *E. coli* strains are harmless, and some are even beneficial. In fact, *E. coli* make up part of the natural flora – bacteria that live in your large intestines.

How pathogens move through and survive in soil

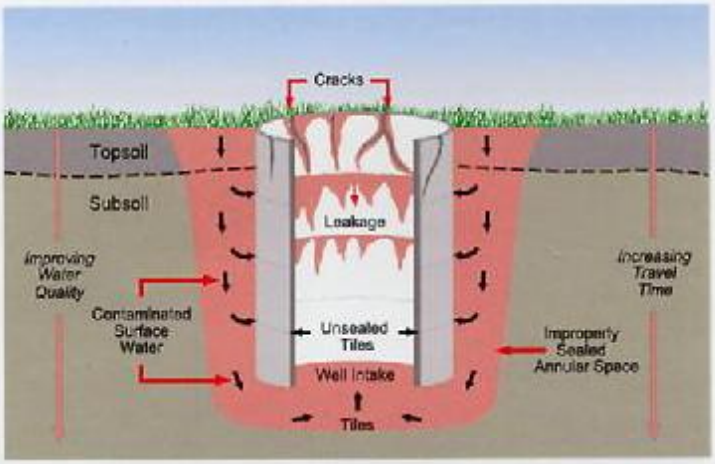
As described in the Information Sheet, *Get Acquainted with Your Well*, when surface water travels down through soil to groundwater, it can take harmful pathogens with it.

Fortunately, soils can have a cleansing effect on harmful pathogens. But if they are able to bypass soils' natural cleansing action, pathogens can survive. Bypass routes can introduce human and animal wastes into groundwater by reducing the time and distance it takes to travel through soils. The shorter the travel time, the greater the risk of contamination.

Have you built an expressway for pathogens?

Some of the facilities or activities on your property might be providing pathogens with these bypass routes. A well that's poorly constructed or plugged provides one route. An onsite septic system that's improperly or poorly designed, maintained or located provides another.

Weather can also create a bypass route. Very heavy rains or flooding can move contaminants through soil at faster rates than normal.



The arrows show the pathways that pathogens can follow to get into an improperly constructed, shallow well. The red shading indicates the "annular space," which is the space outside the well casing that was created when the hole for the well was made. In this well, the annular space is unsealed at the top, and acts as a duct for contaminated surface water to pass down into the well intake at the bottom. To make matters worse, contaminated surface water can also enter the well through unsealed tile joints and cracks. For more information about well construction and maintenance, see Information Sheet, *Get Acquainted with Your Well*.

Is your well playing host?

Get in the habit of putting your well water to the test

How do you know if your well water is playing host to unwanted organisms? Regular testing of your well water is the best way.

Test your well water regularly. Three times per year – in Spring, Summer and Fall – is recommended. Routine testing also provides an early warning signal of potential problems.

Some water-testing lingo

When drinking water is tested for biological (as opposed to chemical) contamination, the bacteria that are tested for are called indicator organisms or indicator bacteria.

The presence of indicators acts as an early warning signal. It tells you there are health risks with your well water. The indicator bacteria usually show up in a test if your water has become contaminated with surface water.

There are two indicator organisms that public health labs will test for when you submit a sample. These are Total coliform and *E. coli*.

Total coliform (or T.C.)

- are a general family of bacteria that is found in animal wastes, surface soils and vegetation
- indicate contamination of water with organisms, and possible evidence of surface water contamination in your well water
- provide an early warning signal that there may be a problem with your water supply

E. coli

- are a group of bacteria that live in the intestines of warm-blooded animals
- indicate recent fecal contamination from sources such as human sewage or livestock waste
- indicate that there is a problem with your water supply

Don't use water that has tested positive for Total coliform or *E. coli*. Don't use it for drinking, making infant formula and juices, cooking, making ice, washing fruits or vegetables, brushing teeth, bathing or showering. And unless you've disinfected it, don't use it to wash hands.

For more information, see the Ontario Ministry of Health and Long-Term Care Web site. It's listed at the end of this Information Sheet.

If your test results show the presence of indicator organisms, take action! Everyone who drinks from your well is at risk. You must identify the source of contamination and prevent its access to your well. It's important to get the job done quickly and right; consult a well contractor or your local health unit as soon as possible.

If your results show that your drinking water meets the Ontario Drinking Water Standards, then continue to have the water tested at least three times a year. One of the three samples you send for testing should be taken in the Spring.

Sample your well water until you have three consecutive samples (collected one to three weeks apart) that meet the Ontario Drinking Water Standards of less than 5 Total coliform and no *E. coli*.

Changes in your water

It's important to know the difference between water quality that could relate to health concerns (termed health parameters) and those processes in nature that only affect the appearance, smell or taste of your water (aesthetic parameters).

A change in your water's aesthetic parameters is not necessarily a health risk. However, they might signal contamination or deteriorating water quality. If you notice a change in these parameters, you should submit a water quality sample for testing as soon as possible.

If you are concerned about the potential presence of a particular contaminant, make sure the contaminant is specifically tested for.

To learn more about what's involved in having your well water tested, please see the Information Sheet, *Putting Your Well Water to the Test*, in this series.

For more information about long-term water treatment options, please see the Information Sheet, *Choosing a Water Treatment System*.

Test three times annually, and when...

In addition to regular testing, well water should be tested:

- after any repairs (such as pump repair or replacement)
- if the well has not been used for several weeks
- if there has been flooding, or
- there has been a change in water appearance, colour or odour.

And if you have one of the "highly vulnerable" water supplies described in the Information Sheet, *Get Acquainted with Your Well*, of this series, you may want to consider having your well water tested more frequently.

For more information

Ontario Government Ministry Abbreviations

Ministry of Health and Long-Term Care
MOHLTC (also MOH)

Ministry of the Environment
MOE (also MOEE)

Ontario Ministry of Agriculture and Food
OMAF (also OMAFRA)

Ontario Government Information Lines

MOE Public Information Centre: 1-800-565-4923

MOE Water Well Records: 1-888-396-9355

MOHLTC INFOline: 1-800-268-1154

OMAF Agricultural Information Contact Centre: 1-877-424-1300

Ontario Government Web Sites

MOE: www.ene.gov.on.ca

MOHLTC: www.health.gov.on.ca

OMAF: www.gov.on.ca/omaf

4 Information Sheets for Ontario Well Owners

This is the third of four Information Sheets for owners of private wells in Ontario. The Information Sheets, plus a Disinfection Instruction Sheet, outline what you need to know and do to protect your well water quality.

Putting Your Well Water to the Test explains why, when and how to get your water tested.

Get Acquainted with Your Well explores well types and well water supplies, and how each can affect the quality of your well water.

Pathogens and Your Well Water takes a close-up look at organisms in water that can pose risks to human health.

Choosing a Water Treatment System gives options for water treatment.

Publications available on-line

Health Canada: www.hc-sc.gc.ca

- *A Guide to Well Water Treatment and Maintenance;*
- *Water treatment devices for disinfection of drinking water.*

MOHLTC: www.health.gov.on.ca

- *How to use water safely during a "Boil Water Advisory";*
- *E. coli Bacteria;*
- List of Public Health Units in Ontario.

OMAF: www.gov.on.ca/omaf

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Ontario

Putting Your Well Water to the Test

Get in the habit of water testing

Water quality can change. Testing your well water three times every year will keep you up-to-date on the quality of your family's drinking water. Next to properly maintaining your well, testing is your best strategy for playing it safe.

This Information Sheet explains which agency or professional provides what kind of testing service, and how to take a sample of your water.

Who does what?

Service	Contact if...	How to Locate
Public Health Unit	• you suspect that surface water, or human or animal waste, have entered your well • you require a water sample bottle for indicator bacteria testing • you require help in interpreting your water quality sample results	• see the public health unit listing in your local Blue Pages • look on the Ministry of Health and Long-Term Care Web site or call their INFOline – both are listed at the end of this Information Sheet
Public Health Lab	• you require a water sample bottle for indicator bacteria testing • public health labs perform bacteriological water testing only	• call the Ministry of Health and Long-Term Care INFOline listed at the end of this Information Sheet
Private Accredited Lab	• you have concerns about chemicals in your well	• for information about accredited laboratories, contact MOE at 1-800-565-4923
Licensed Well Contractor	• you have concerns that your well is improperly constructed, or requires upgrading or maintenance	• see the listings under the "Water Well Drilling & Services" heading in your local Yellow Pages • ensure they are licensed to provide this service

Ontario

In Ontario, public health labs will test for bacteria and other organisms – not chemical substances. If you suspect that you might have problems with your water that are chemical in nature, such as with sulphur or solvents, send a water sample to a private, accredited lab. To find one near you, see the Ontario Ministry of the Environment's Web site, listed at the back of this Information Sheet.

Testing water for bacteria – what to expect

Completing the form

You must complete the form. Water will not be tested if the form is not completely and accurately filled in.

Be prepared to supply the following information:

- your daytime telephone number
- the four-line detailed location, including postal code, of your water source
- your public health unit number (see page 2 of water-sample submission form)
- an indication of how you wish to receive your results
- the date the sample was collected
- a complete mailing address for results.

Note: Do not submit samples from high-risk water supplies, such as lakes, rivers or streams, unless water has been properly treated first.

Sampling your water for accurate results

1. Get a proper water sample bottle from the public health laboratory or your local public health unit, or one of the designated pickup stations in your area. Only water collected directly into these bottles will be accepted.

2. Plan to sample your well water when you're sure you can deliver it to the public health unit or other designated location within 24 hours. Your water sample should not be left sitting for a long period of time as this can lead to inaccurate results.

3. Remove any aerator, screen or other attachments from your faucet. Don't take a sample from an outside faucet or the garden hose. Take a sample from an inside tap with no aerator, such as the bathtub.

4. Disinfect the end of the faucet spout with an alcohol swab or dilute bleach solution (1 part household bleach to 10 parts water) before running water to remove debris or bacteria. Disinfecting the tap with a flame is not recommended because this can damage the faucet.

5. Turn on cold water and let it run for 3 to 4 minutes to remove standing water from your plumbing system.

6. Remove the sample bottle lid:

- don't touch the inside of the lid
- don't put the lid down
- don't rinse out the bottle.

7. Fill the bottle to the level that is marked, as described in the enclosed instructions, and close the lid firmly.

8. Keep the sample cool (but not frozen) until it's returned to the drop-off location. Again, deliver the sample within 24 hours or it may not be processed. Remember that proper handling will help to make sure that your test results are accurate! Don't store samples in warm places such as your car trunk.

Interpreting results

Bacteria – Total coliform include bacteria that are always present in animal wastes and sewage, but are also found in soil and vegetation. Their presence may indicate that surface water is entering your well.

Escherichia coli (or *E. coli*) are bacteria found only in the digestive systems of people and animals. Their presence in your well water is usually the result of animal or human waste contamination from a nearby source.

For more about bacteria and other pathogens, see the Information Sheet, *Pathogens and Your Well Water.*

Test outcomes

Organisms	Ontario Drinking Water Standards Interpretation		Reason
Total coliform per 100 mL *E. coli* per 100 mL	5 or less 0	**no significant evidence of bacterial contamination**	• 3 samples in a row, taken 1 to 3 weeks apart, with this designation are needed to determine the stability of the water supply
Total coliform per 100 mL *E. coli* per 100 mL	more than 5 0	**significant evidence of bacterial contamination**	• may be unsafe to drink • consult your local public health unit for information as soon as possible
E. coli per 100 mL	more than 0	**unsafe to drink – animal or human waste contamination**	• unsafe to drink • evidence of animal or human waste contamination • consult your local public health unit for information immediately

If your well water test shows unacceptable levels of bacteria, stop drinking the water immediately!

If your well water tests positive

Immediate measures

- Stop using the well water.
- If you want to continue to use your well water, bring it to a rolling boil for at least one minute before using it for drinking, making infant formula, juices, ice or recipes, brushing your teeth, rinsing contact lenses, and washing food or dishes. Your boiled water supply should always be refrigerated until it is used.
- Consider using alternative water sources such as bottled water or municipal supply if available.

Longer-term measures

- Disinfect your well and entire household plumbing system. See the Disinfection Instruction Sheet.
- Have your well water re-tested to confirm that your water supply doesn't contain disease-causing bacteria and now meets the Ontario Drinking Water Standards.
- Chronic, ongoing problems may mean you need to have your well and plumbing system professionally inspected. This will help to determine possible reasons for the poor water quality results, such as surface water entering the top of the well. Contact a licensed well professional to help you with this task.

  (Long-term water treatment options are discussed in the Information Sheet, *Choosing a Water Treatment System.*)
- Contact your local public health unit or the Ontario Ministry of the Environment for more assistance.
- Consider replacing the existing well with a new well that meets present-day well construction practices.

For more information

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Ontario Ministry of Agriculture and Food
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4 Information Sheets for Ontario Well Owners

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Get Acquainted with Your Well explores well types and well water supplies, and how each can affect the quality of your well water.

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Get Acquainted with Your Well

If you live in a rural area, chances are your family's daily water supply comes from a well on your property. If you haven't already, get acquainted with your well. It's the first step in doing everything you can to protect the quality of your well water and the groundwater we all share.

In this Information Sheet, we'll explore types of wells, their maintenance and well water supplies, and how each can affect the quality of your well water.

What have you done for your well, lately?

As a well owner, and someone who wants to ensure the water your family is drinking is safe, you need to:

- properly maintain your well to prevent it from being damaged, cracked or contaminated
- understand where your water comes from, and be aware of risks
- have your water tested regularly
- be "well" informed – let this Information Sheet series be the first step.

Your well and your well's water are your responsibility

You have a legal responsibility for the condition of all wells on your property, under the authority of Ontario Water Well Regulation. A copy of the regulation is available on the Ontario Ministry of the Environment Web site. Please see the back page of this Information Sheet for the Web site address.

A watertight well keeps contaminants out of your well water… and out of the groundwater your well draws from

Your well taps directly into a groundwater source. Groundwater is a shared resource we all rely on. Contamination from one well can put people at risk far beyond your property. A properly maintained well and water testing help protect the groundwater that supplies your well water. Shortcuts risk future costly repairs and health hazards to family and neighbours.

What type of well do you have?

There are different types of wells. Like most homeowners, you probably didn't or won't become directly involved in the construction of your well. But you should know what type of well you have because its design, construction and maintenance have a direct effect on the quality and quantity of water you draw from it.

Here's the take-home message, regardless of well type: water, and nothing but water, should enter your well, and it should only enter your well from the bottom.

The sides and top of your well should be watertight – free of leaks and seepage. No contaminant or foreign material should ever have access to your well, anywhere! Otherwise, these could harm the water your family draws from it and the groundwater it draws from.

When it comes to wells, think watertight!

Water Well Record

A Water Well Record provides very important information about your particular well. As a well owner, you should get a copy of the Water Well Record that was filed after your well was built. Contact the Ministry of the Environment at 1-888-396-9355.

Ontario

Plug and seal any old, unused well

If you have an old well on your property that won't be used again, plug and seal it properly as soon as possible. This is important to:

- protect the aquifer below from surface contamination
- prevent serious accidents to humans, livestock and wildlife.

Each well and its surroundings are unique. Contact a licensed well contractor for the proper method of "abandoning" your old well.

Never use an old well as a garbage dump – especially for hazardous materials. That old well taps into tomorrow's drinking water.

If you have a well that you're not using now, but might use in the future, you must maintain it like any other working well.

Do you know where your well water comes from?

Some water sources are at greater risk than others.

Your water well reaches down into an aquifer, which is a layer of rock or soil that holds and transmits large amounts of water. Just as well types and conditions can pose levels of risk that you should manage, so do different sources of water.

For example, in some cases, the protective soil above an aquifer is very shallow– less than 3 metres or 10 feet deep. This leaves the water in the aquifer vulnerable to contaminated runoff from above.

Is your water supply "highly vulnerable"?

The most common types of vulnerable water supplies are:

- below-grade wells, including well pits and buried wells, where the top of the well casing is below ground level, are highly vulnerable to contamination from natural gas build-up, vermin and the surface water that can collect and drain into them
- cisterns, which are reservoirs used to collect and store water, pose risks because they contain surface water and otherwise untreated water

  Tip: Never use an old well as a cistern, as contaminants from rain water or tile drains will eventually reach groundwater.
- groundwater springs, where the water table meets the earth's surface, may easily be exposed to contaminants from human activities nearby, and the water may only have been in the ground for a short time
- surface water trench systems, also known as shore wells, pose risks to human health if water is untreated (e.g., from rivers or lakes, or from structures that indirectly collect surface water)

  Tip: All untreated surface water is unfit for human consumption.

If you think your water supply may be "highly vulnerable", don't use it, if at all possible. Try to find alternatives. If you can't, make sure you test your water, treat it (see Information Sheet, *Choosing a Water Treatment System*), and consider relocating your well.

A rule-of-thumb for assessing the risk of problems with well water quality:

The deeper the well... The longer it takes surface water to enter the well... The lower the risk of contamination.

The risk of contamination also decreases the farther away the well is from potential sources of contamination.

What's going on around your well – on your property and beyond?

Now that you've gone underground to think about your well and the water it draws from, it's time to look around above ground. How close is your well to potential sources of contamination?

Your well water can become contaminated at different locations – around your well, away from your well on your property, or in a well off your property that is uphill of your well.

Is your well upslope or downslope?

Whenever a well is located at a lower ground level than the surrounding area, the water in your well is exposed to runoff and potential contamination from septic beds, livestock yards, ponds and streams, etc. Be careful of practices on your property and aware of practices on higher ground off your property that may affect the quality of water recharging your well.

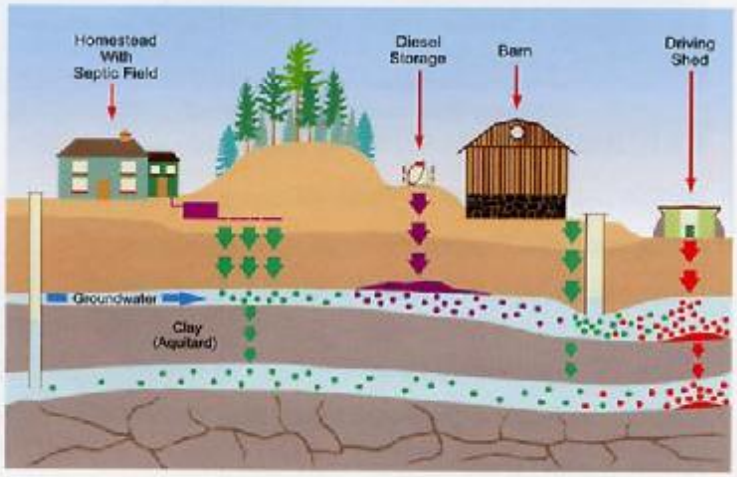
Does surface water pool around your well?

This is not a good sign. If surface water around or near the well can gain direct entry into the well and aquifer, this puts your water supply at risk. It may also mean your well isn't properly sealed.

Contamination checklist

Look around to see if any of these contamination sources are in the vicinity of your well:

- bacteria from malfunctioning septic systems
- livestock manure
- fuel from leaking storage tanks or spills
- chemical pesticides and fertilizers that are improperly stored or applied
- household hazardous wastes, such as paints and solvents, that are improperly stored or disposed of
- road salt runoff
- animal feces (from pets or wildlife).



Contaminants that reach your aquifer may show up in your well water, sooner or later. The shortest pathway for a contaminant (including surface water) to your well is direct entry through the well casing, or by leaking down the outside of an improperly sealed well casing.

Every well owner should put their water to the test!

Even if none of the conditions just described apply to you, and even if your water is clear and clean, have your well water tested. It's the only sure way of knowing that the water you and your family are drinking is safe.

Testing for bacteria in well water is offered as a service to owners and users of private wells by the Ontario Ministry of Health and Long-Term Care. Sample bottles are available from public health laboratories and your local public health unit.

For more information, see other Information Sheets, *Pathogens and Your Well Water* and *Putting Your Well Water to the Test*, in this series, and contact your local public health unit.

Well Safety Checklist

Outside Your Well

√ Know exactly where your well is located.

√ Keep potential contamination sources and activities away from your well.

√ Mound up the ground around the well casing. The ground should slope away from your well.

√ Make sure that your well's casing extends at least 40 cm (16 in.) above the mounded earth.

√ Keep a permanent grass buffer at least 3 metres (10 ft.) around the well.

√ Watch for ground settling around the outside of the well casing. This suggests that surface water could be accessing your well.

√ Plug and seal any well that is no longer in use or no longer properly maintained.

Inside Your Well

√ Make sure that a commercially manufactured well cap or sanitary seal is securely in place. Inspect the cover or sanitary seal for cracks and holes.

√ Inspect inside the well once every year. Early spring after snowmelt is a good time. Also:

- look and listen for signs of surface water seeping or running freely into the well
- look for seepage through cracks or stains below joints on the inside of the well casing
- remove any debris floating in the well and prevent any more debris from entering it.
- compare your well's construction to diagrams showing proper techniques.

√ Disinfect the well and plumbing with chlorine solution after doing any work inside the well, or on pumping equipment (see the Disinfection Instruction Sheet).

√ Check the condition of well vents. Look for flaws such as cracks or weakness in the vent tubing. Make sure that the fine-mesh screen is in place.

(see over)

Your Well Water

√ Watch for changes in water taste, odour and colour.

√ Have a sample of your well water tested for indicator bacteria:

- at least three times/year, with one of those samples done in the spring
- more frequently than three times/year if you suspect problems
- more frequently than three times/year if you have a "highly vulnerable" water supply as described in this Information Sheet.
- after major plumbing work.

√ Test for nitrate once every year, or more often if you have concerns. (Nitrate is a form of nitrogen that is stable in groundwater. Excessive levels can lead to health problems.)

For more information

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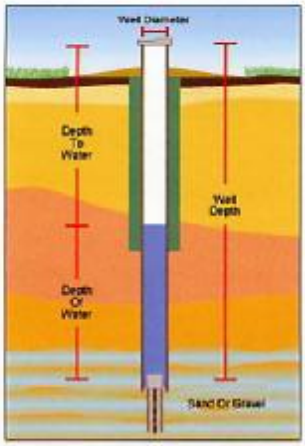
Ontario

Disinfection Instruction Sheet



If your drinking water continues to test positive on repeated submissions, consult your local health unit, which can help you interpret the results of your tests and provide you with advice on what measures you can take to safeguard your drinking water.

The first step in identifying the reason for repeated adverse water quality is to conduct a visual inspection of your well. Start with a close look at your well. The area around it should be clear of any potential contaminant sources, such as pets, lawn care products, and gardens. Once you're satisfied that the area around your well is okay, take a good, close look at the well itself. If you have an older well, make sure that the cap and the sealant around the well casing isn't cracked or damaged. If it is, you need to fix or replace it right away.

If the source of the problem can't be detected, consult a licensed well contractor right away to identify the source of the problem and eliminate it. You can save yourself a lot of money by doing this instead of rushing out to buy a home treatment device that may be expensive to install, operate, and maintain. And it may not eliminate the source of your trouble.

(If you have a cistern, please talk to your public health unit about disinfection requirements.)

1. Measure the diameter of the well.
2. Measure the well depth and the static or resting water level, then calculate the depth of water in the well.
3. Using the table on this sheet, measure out the amount of bleach needed. (The table gives the volume of bleach needed for different well sizes.) Then, pour the mixture into your well.
4. If possible, mix the water in the well. This can be accomplished by attaching a hose to a tap, running water from the well, through the hose and back into the well.
5. After adding chlorine to the well, remove or bypass any carbon filters that are in the system for water treatment. If you don't, these filters will remove the chlorine from the water, and any pipes beyond the filter will not get disinfected. Replace with new filters after chlorination to avoid reintroducing bacteria into the system.
6. Run water at every faucet in the house (and barn, if you have one) until a strong chlorine odour is detected. Be aware that your nose may lose its ability to detect chlorine.
7. If there is no chlorine smell or it is very weak, add more bleach to the well and repeat Step 6 above.
8. Drain the water heater and fill with chlorinated water.
9. Backflush the water softener and all water filters (except carbon filters).
10. Let the chlorinated water stand in the system for at least 12 hours.
11. Clear chlorine from the well by running an outside hose to the ground surface. Then, run clear water through the faucets until the water no longer smells of chlorine.
12. Avoid putting too much chlorine into the septic system because the bacteria needed for septic decomposition may be killed.
13. Do not drink the water without boiling it until test results show the water is safe to drink.

Volume of Bleach to Add for Every 3 Metres (10 Feet) of Water in the Well*		
Casing Diameter		Volume of Unscented Bleach (5.25% solution)
Millimetres	Inches	Millilitres
50	2	6
100	4	30
150	6	60
200	8	100
250	10	200
300	12	250
400	16	400
500	20	650
600	24	900
900	36	2000 (2 litres)
1200	48	3600 (3.6 litres)

For example: If you have 6 metres (20 feet) of water in your well and it has a casing diameter of 100 mm or 4 inches, you would add 60 mm or 2 fluid ounces of bleach.

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For more information

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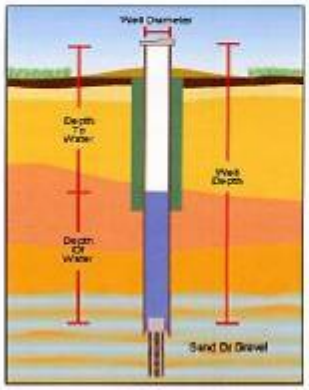

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- *Water treatment devices for disinfection of drinking water.*

MOHLTC: www.health.gov.on.ca

- *How to use water safely during a "Boil Water Advisory";*
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OMAF: www.gov.on.ca/omaf

- *Assessing the Potential for Ground Water Contamination on Your Farm*, Publication 97-017;
- *Best Management Practices: Water Wells*, OMAFRA and Agriculture and Agri-Food Canada, 2003 (to order).

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- *Important Facts About Water Well Construction*, Publication 3788;
- *Water Wells and Groundwater Supplies: The Protection of Water Quality in Bored and Dug Wells*, Information Sheet PIB 601b;
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Ontario

Choosing a Water Treatment System

In this fourth and final Information Sheet on water wells, we look at various systems for treating well water.

While there are many technologies out there, each one is effective for a specific water contamination concern. No single treatment technology works for all. So, when you're selecting and applying a water treatment system, use great care to make sure it is the right one for your particular situation. Let's examine some circumstances that can make treatment necessary.

Treatment alone may not be enough to guarantee a consistent supply of safe and high quality water. In some cases, such as below-grade wells, structural changes may need to be made to maintain good water quality.

Why treat your water supply?

You may have to treat your well water to make it safe to drink if you draw your water supply from: water that is "highly vulnerable" to contamination – described in the Information Sheet, *Get Acquainted with Your Well*; a poorly constructed well or one that cannot be repaired to meet today's well construction standards; or a source that has periodic episodes of poor water quality.

If any of these situations applies to you, your drinking water may be susceptible to harmful organisms (pathogens such as bacteria, parasites and viruses), chemicals and other changes to your water's taste, odour and/or appearance.

As you're learning more about treatment systems, just a reminder: begin with a properly built and maintained well, and have your water tested regularly. Otherwise, you may always be treating a problem, and never resolving it.

Ask around

It's always in your best interest to find out as much as possible about your well. The local public health unit, the Ontario Ministry of the Environment (MOE), your Water Well Record available from MOE, water well drillers, municipal staff, environmental consultants and neighbours may all have useful information. As a well owner, you need to review all this information carefully to help you decide if testing your well water for dissolved chemicals is needed.

Choosing a treatment system

Treating highly vulnerable sources can be costly and tricky

Treatment systems can be used on water from most sources in order to make it safe for drinking. However, treating highly vulnerable water sources is usually expensive and difficult, and will require a great deal of your time to make sure the equipment is looked after properly. Contact your local public health unit and/or a water treatment professional when selecting, installing and operating a treatment system.

By contrast, treating water from properly constructed and maintained wells is generally easier, but again the technology used must be selected carefully.

Remember their limitations!

Here are a few key limitations of treatment systems.

Disinfecting a well with chlorine works against bacteria and many viruses, but cannot be relied on to kill all parasites. Also, chlorine cannot be relied on to kill tiny organisms embedded inside tiny dirt particles. For water sources that may be contaminated with surface water, an effective filtration treatment will also be needed.

There are many treatment systems on the market. Some of these are referred to as "point-of-use" systems, where the equipment is attached to one faucet. Others are "in-line" and provide treated water for an entire home. These systems are based on different technologies, ranging from chemical treatment to mechanical treatment (e.g., filters to ultra-violet light). Each system has its benefits and limitations.

Heating water to a rolling boil for at least one minute is an effective method for killing harmful organisms. However, it does not remove most dissolved contaminants (such as chemicals) and it is impractical for treating large quantities of water.

Don't scrimp on installation

For each water treatment system to remain effective, it must be installed, operated and maintained as directed by the manufacturer. **In water treatment, there are no shortcuts!**

Private Well Water Treatment Technologies

Method	Uses	Limitations	Comments
Distillation	• kills all microbes by heat • removes heavy metals and nitrates • often used in combination with activated carbon filters	• can remove only chemicals (e.g., fluoride, iron, nitrate) with a higher boiling point than water	• needs regular de-scaling and weekly disinfecting with bleach or heat • can concentrate chemicals (with boiling points lower than water) in distilled water (e.g., ammonia)
Ultra-Violet	• kills bacteria and viruses	• needs filtration to remove microbes embedded in dirt particles, including parasites	• needs very fine (5 micron pre-filter), slow water flow, and UV lamp must be kept clean
Chlorination	• kills bacteria and viruses • can be used to remove some forms of iron, as long as water is filtered after chlorination	• needs filtration to remove microbes shielded or embedded in dirt particles, including parasites	• needs careful handling of chlorine, testing of chlorine levels, and maintenance of dosing pump
Ozonation	• kills most microbes, but not cryptosporidium • removes organic compounds, including pesticides • can be used in combination with activated carbon filters	• needs filtration to remove microbes embedded in dirt particles, including parasites	• varies in effectiveness depending on application and manufacturer • contact local public health unit for more information
Activated Carbon Contactors	• remove small amounts of some chemicals • used for removing tastes and odours, and reducing trace levels of organic chemicals (e.g., pesticides)	• are not suitable for removing minerals, or larger amounts of chemicals	• must be replaced regularly but hard to know when contactors are exhausted • can become a dangerous source of bacteria and taste and odour problems
Filters	• use ceramic candle filters to remove bacteria and parasites, but not viruses • use other filter types to remove sand, sediment, rust and particles • use specially rated filters to remove very small particles	• need chlorination in addition to ceramic candle filters to remove viruses	• need regular maintenance and replacement for proper operation
Greensand Treatment	• removes moderate amounts of iron and manganese	• is unsuitable for removing microbes	• is not easy to operate or maintain • needs regular backwash and periodic reactivation with permanganate solution and/or bleach
Reverse Osmosis	• removes nitrates, sulphate, hardness, most microbes, dirt particles and small amounts of some pesticides	• can result in plugged membranes due to hard water	• is costly because of need to replace membrane • needs prefiltration and softening of hard water
Softeners	• reduce hardness that produces lime deposits on dish-washed items, and gives a starched effect on laundry	• are not suitable for removing microbes or most chemicals • increase sodium concentration in treated water	• need periodic replacement of softener salt and disposal of concentrated salty water

Please note:
Equipment carrying the National Standards Foundation ("NSF certified") trademark has been thoroughly checked for performance and the manufacturing facility is inspected annually. There are several NSF standards. Check for the appropriate NSF standard number for your treatment needs. Consult your local public health unit and reputable expert companies.

Common Well Water Quality Problems

Concern	Cause	Consequences	Options
***E. Coli* Bacteria Detected**	• human or animal sewage getting into well	• may result in serious illness – of special concern to visitors, infants, seniors and other frail individuals • stop using well water	• use alternate water supply, and • consult local public health unit staff for advice
Coliform Bacteria **(Total Coliform > 5 Counts)**	• surface water getting into well	• early warning of possible illness	• consult local public health unit for advice • inspect and repair well • shock chlorinate well if necessary, and • retest
Fluoride	• naturally occurring mineral in aquifer	• high levels can result in mottling of children's teeth • in severe cases, bone defects can occur	• test for level • avoid fluoride dental treatment and toothpaste, and • distill water for drinking or use bottled water if level is very high
Iron	• naturally occurring mineral in aquifer	• yellow or red cloudy water • not hazardous to health • can stain plumbing and laundry • may increase over time and make well water unusable	• use chlorination–filtration • consider greensand treatment, and • distill water
Iron Bacteria	• growth of non-harmful bacteria, creating black slime and particles	• well pump failure (overheating), low flow rates • may increase over time	• shock chlorinate
Pesticides	• local spraying, spills	• long-term health risk	• stop using well water • use alternate water supply, and • consult local Ministry of the Environment and public health unit staff about treatment options
Fuels **(Gasoline, Diesel, Heating Oil)**	• leaking old storage tank, spills	• long-term health risk	• stop using well water • use alternate water supply, and • consult local Ontario Ministry of the Environment and public health unit staff about treatment options
Nitrates	• nutrient application and septic systems	• health risk for infants when nitrate is above 10 ppm	• use alternative water supply for drinking and cooking, and • use reverse osmosis or distillation
Hydrogen Sulphide	• naturally occurring gas, or harmful bacteria that is releasing sulphate	• not a health hazard	• use chlorination–filtration, and • use greensand treatment
Hardness	• naturally occurring minerals in aquifer	• not a health hazard	• add softener, and • use an alternate soap and detergent for moderately hard water

Please note:

- Deep well water quality is not constant and can change over time. Iron and manganese concentrations may increase to unacceptable or untreatable levels. Iron bacteria problems can also become severe enough to force well abandonment.
- Shallow well water quality can change seasonally. Water quality in highly vulnerable wells (less than 3 metres or 10 feet in depth) may change within hours or several days after rainstorms or thaws.

For more information

Ontario Government Ministry Abbreviations

Ministry of Health and Long-Term Care
MOHLTC (also MOH)

Ministry of the Environment
MOE (also MOEE)

Ontario Ministry of Agriculture and Food
OMAF (also OMAFRA)

Ontario Government Information Lines

MOE Public Information Centre: 1-800-565-4923

MOE Water Well Records: 1-888-396-9355

MOHLTC INFOline: 1-800-268-1154

OMAF Agricultural Information Contact Centre: 1-877-424-1300

Ontario Government Web Sites

MOE: www.ene.gov.on.ca

MOHLTC: www.health.gov.on.ca

OMAF: www.gov.on.ca/omaf

4 Information Sheets for Ontario Well Owners

This is the fourth of four Information Sheets for owners of private wells in Ontario. The Information Sheets, plus a Disinfection Instruction Sheet, outline what you need to know and do to protect your well water quality.

Putting Your Well Water to the Test explains why, when and how to get your water tested.

Get Acquainted with Your Well explores well types and well water supplies, and how each can affect the quality of your well water.

Pathogens and Your Well Water takes a close-up look at organisms in water that can pose risks to human health.

Choosing a Water Treatment System gives options for water treatment.

Publications Available On-Line

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