



**Renewal Application for Water Licence S03L1-001
Glossary
(Section 2 of 20)**

Submitted to the Sahtu Land and Water Board by Imperial Oil Resources N.W.T. Limited

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2.0 Glossary

Terms and Definitions

Term	Definition
Abandonment	To close, or cease to maintain a facility, with the intent that the facility is unlikely to be reinstated into service within the foreseeable future.
Abandonment & Reclamation Program	Generally describes the program(s) approved by the Sahtu Land and Water Board to manage portions of the Norman Wells Operations no longer required for operations.
Acres	A unit of area measurement equal to 4046.9 m ² .
Acute lethality test	An effluent is deemed acutely lethal if the undiluted (100%) effluent kills 50% or more of the fish or daphnia when the test is run according to documented protocols.
Alkalinity	A measurement of water's capacity to neutralize an acid. It indicates the presence of carbonates, bicarbonates and hydroxides and, less significantly, borates, silicates, phosphates and organic substances. It is expressed as an equivalent of calcium carbonate. The composition of alkalinity is affected by pH, mineral composition, temperature and ionic strength. However, alkalinity is normally interpreted as a function of carbonates, bicarbonates, and hydroxides. The sum of these three components is called total alkalinity.
Analyst	Means an Analyst designated by the Minister under Section 35(1) of the <i>Northwest Territories Waters Act</i> .
Application	Imperial Oil's 2013 submission for a renewal of the existing Type "A" Water Licence from the Sahtu Land and Water Board (Licence No. S03L1-001 as amended). Also referred to as Renewal Application.
Aquatic Effects Monitoring Program	A monitoring program designed to determine the short and long-term effects in the receiving environment resulting from a project, to evaluate the accuracy of impact predictions, to assess the effectiveness of impact mitigation measures and to identify the need for additional impact mitigation measures to reduce or eliminate environmental effects.
Artificial Islands	The physical structure of the constructed islands, including sand core, slope and scour protection, drilling equipment and supplies, storage facilities, well head equipment, and temporary or permanent buildings.
Artificial Lift	A system used to lift oil from the reservoir up the tubing string in a well that will not flow by itself. e.g., electric submersible pump or gas lift.
Average Concentration	The concentration as determined in Part B Item 5 of the "Surveillance Network Program" general requirements (Licence No. S03L1-001).
Barrel	A measurement of crude oil volume. A barrel contains 42 U.S. gallons or 159 litres (0.159 m ³).
Basin	The land area drained by a river and its tributaries.
Bathymetric survey	Survey of water depths and bottom topography under a waterbody (lake, ocean, river, etc.). IOR does these surveys on the Mackenzie River to help identify and understand what changes have occurred on the River bottom during breakup.

Term	Definition
Battery	A facility that collects production liquids (multiphase) from one or more wells and then sends it to the central processing facility for further processing, distribution, and/or injection.
Bedrock	A type of solid rock that underlies unconsolidated surface material.
Benthic Macroinvertebrates	Invertebrates (animals lacking a backbone) that are large enough to be seen by the naked eye and that live at the bottom of waterbodies.
Biodegradation	A microbiologically mediated process (e.g. due to the action of bacteria, yeasts and fungi) that alters the structure of a substance by breaking it down into smaller components.
Boards	Land and Water Boards of the Mackenzie Valley (Gwich'in, Sahtu, Mackenzie Valley and Wek'èezhìi Land and Water Boards).
Borrow pit	A pit created to provide earthen materials that can be used for fill at another location.
Breakup	The period from the time the ice first starts to move in the Mackenzie River at Norman Wells in the spring, to the time when the River is free of pack ice at Norman Wells.
Carbonate reef	A type of oil and gas reservoir formed by a coral reef from which hydrocarbons can be withdrawn.
Cathodic Protection	A means to prevent the corrosion of metal on a pipeline or piece of equipment by providing a sacrificial anode that preferentially corrodes.
Central Processing Facility	IOR's plant where oil, gas, and produced water are collected from the oilfield and separated, with plant cooling being accomplished using Mackenzie River water. All buildings, structures, storage, equipment and surface improvements included in the Central Processing Facility, not including field flowlines, production facilities or wells.
Committee on the Status of Endangered Wildlife in Canada	A committee of scientific experts created as a response to the Species at Risk Act to assess and designate wildlife species that are at risk of disappearing from Canada.
Composite Sample	A sample composed of proportional subsamples taken over a designated time period.
Concentration	A quantifiable amount of a chemical or substance in a given environmental medium. Concentration may be expressed in units such as mg/L (in water), mg/kg (in soil) or mg/m ³ (in air).
Conductivity (Water)	The measure of a water body's capacity to conduct an electrical current. It is the reciprocal of resistance. This measurement provides the limnologist with an estimate of the total concentration of dissolved ionic matter in the water. Measurement of conductivity provides a quick check of the alteration of total water quality due to the addition of pollutants to the water.
Confluence	A junction of two or more rivers.
Contaminant	Any physical, chemical, biological or radiological substance in air, soil or water that has an adverse effect. Any chemical substance whose concentration exceeds background concentrations or which is not naturally occurring in the environment.
Contamination	The introduction into soil, air or water of a chemical, organic or radioactive material or live organism that will adversely affect the quality of that medium.

Term	Definition
Corrosion	The process of corroding (damaging through oxidation or other chemical means) metal or other object; e.g. rust formed by the oxidation of metal.
Corrosion Inhibitor	A chemical applied either in batches or continuously to prevent corrosion.
Criteria	Numerical standards that are established for the concentrations of chemical substances in soil, groundwater, surface water, and sediments that relate to the suitability of a site for specific land uses and land use categories. Criteria are also often referred to as guidelines.
Crown	The Crown is a corporation sole that, in the Commonwealth realms and any of its provincial or state sub-divisions, represents the legal embodiment of executive, legislative, or judicial governance. For example, the Government of Canada.
Crude Oil	Naturally occurring, unrefined petroleum product composed of hydrocarbon deposits.
Decanting	The pump-off of usually clear, non-turbid supernatant fluids from a sump without disturbing the sediment or the liquid lower layers containing suspended solids.
Decommission	The act of taking a processing plant or facility out of service and isolating equipment to prepare for routine maintenance work, suspension or abandonment.
Deline District	Refer to Section 9 Maps & Figures: Figure 1.1.
Delta	The area of alluvial deposits formed at the mouth of a river.
Demolition	To tear down completely (e.g. a building).
Department of Fisheries and Oceans	A federal government department charged with the protection of Canada's fisheries and oceanic resources.
Detection limit	The lowest concentration / smallest amount of substance that a laboratory test is capable of detecting.
Discharge	The rate of a liquid stream flow at a given instant, measured in terms of volume per unit of time. For example, m ³ /s.
Discharge Return Line	A pipe that is used as the conveyance mechanism to transfer water from the CPF to a discharge point.
Dismantling	To take apart or remove, either equipment or a process.
Dispersion	The process whereby solute or gas spreads to the surrounding air, water or groundwater due to diffusion and physical mixing.
Drilling Sump	An excavated area with soil walls and base, that is used to contain waste drilling fluids and solids.
Ecological Landscape Classification System	The grouping of landscapes based on distinct ecoregions.
Ecoregion	An area that is characterised by a distinct set of species, vegetation communities and physical characteristics such as drainage and climate conditions.
Electrical Conductivity	A measure of how well a material accommodates the transport of electrical charge. In the case of soluble ions, electrical conductivity is measured in millisiemens per centimetre.
Emergency Response	Post event action taken to minimize the consequences of an emergency.

Term	Definition
Emergency Response Plan	A thorough description of procedures to be followed by all parties in the event of an accidental release of material or other emergencies such as fire, bomb threat, etc.
Emulsion	A suspension of small globules of one liquid in a second liquid with which the first will not mix: an emulsion of oil in water.
Enbridge Pipeline	A 12-inch diameter 869 km long pipeline starting in Norman Wells, Northwest Territories and terminating in Zama, Alberta. The pipeline was constructed between 1983 and 1985.
Exceedence	A measurement of an analytical parameter that is above / greater than the amount allowed by a regulatory authority.
Field	The Field refers to those areas of Imperial Oil's Norman Wells Operations that are outside the boundary of the Central Processing Facility but inside the Proven Area such as wells, pads, and pipelines.
Flare Stack	A stack in the CPF that is used to burn combustible gases.
Flocculent	A substance that promotes the clumping of particles.
Flowline	A line that is used to transport fluids from a well to a production facility or vice versa, and includes intrafield export and all gathering lines.
Flowline Integrity Inspection	Inspection of the structural condition of a flowline.
Flowline Pigging	The process of using a device, a 'pig', that can freely move through a flowline for inspection or maintenance.
Gas Lift	An artificial lift method for oil wells. Natural gas is injected into the casing-tubing annulus, through gas-lift valves, and into the tubing to form bubbles that raise the produced liquids.
Grab Sample	An instantaneous sample of water.
Groundwater	Water that occurs in the subsurface pores of sedimentary rocks.
Groundwater Monitoring	The process of monitoring subsurface water quality, water level, or both, through a well.
Hardness (for water)	The sum amount of ions, primarily calcium and magnesium, that can precipitate from water. Hard water will form scale.
Horizon	A soil layer that is distinguishable from adjacent layers by either: characteristic physical properties, e.g., structure, color or texture and chemical composition, including content of organic matter or degree of acidity or alkalinity.
Hydrocarbon	Any organic compound consisting primarily of carbon and hydrogen.
Indicator	A measure of the condition of something of interest. Indicators are often used as variables in the modeling of changes in complex environmental systems.
In-Line Logging Inspection	The internal inspection of a flowline or pipeline using a specialized measurement tool that is put inside the line and moved along the length of it.
Licencee	The holder of the Licence.
Limestone	A hard sedimentary rock composed largely of calcium carbonate or dolomite.

Term	Definition
Management System	A system for ensuring that objectives are achieved. Key elements typically include: scope and objectives, processes and procedures, resources responsible for implementing and executing the system, a verification and measurement method to determine if desired results are being achieved, and a feedback mechanism to provide a basis for further improvement.
Microtox	A bioassay test that monitors changes in the level of light emission from a marine luminescent bacteria when challenged with a toxic substance or sample containing toxic materials, and is used to provide a more rapid, real-time measurement of acute toxicity. Microtox Test is measured as EC50(15) or IC50(15).
Migratory Bird Convention Act	Federal legislation protecting migratory birds and their nests.
Mitigation	Measures to control, reduce, prevent, eliminate, or avoid an adverse environmental impact.
Modification	An alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion.
Monitoring Well	A well that is used to monitor groundwater quality and levels.
National Ecological Framework for Canada	The National Ecological Framework for Canada is a report that defines the ecozones, ecoregions and ecodistricts of Canada. The most recent version contains additional information regarding spatial data and attributes (e.g. climate, geology).
National Historic Site of Canada	Federally designated sites of historical significance to Canada.
Natural Islands	Islands formed by natural processes including Bear, Goose, and Frenchy's Islands.
Natural Seeps	An area where liquid or gaseous hydrocarbons naturally come to the surface.
Norman Wells Operations	Imperial Oil's facilities at Norman Wells used for the extraction and processing of oil, natural gas and associated produced water.
Operations	Norman Wells Operations.
Particulate Matter	Substances (dusts, fibres, or mists) suspended in air that a person might inhale.
Permafrost	A subsurface layer of waterlogged soil that remains frozen throughout the year and occurs in northern latitudes.
Petroleum	A liquid mixture of hydrocarbons present beneath the earth's surface that is extracted and refined to produce fuels and other products.
Petroleum Hydrocarbon	The mixture of hydrocarbons normally found in petroleum. The mixture includes hundreds of chemical compounds.
Phenols	Any compound that contains a six-membered aromatic ring, bonded directly to a hydroxyl group (-OH). Many phenols are man-made chemicals. They are also found in nature in animal wastes and organic material.
Polycyclic Aromatic Hydrocarbons	A compound built from two or more benzene rings. Sources include fossil fuels and incomplete combustion of organic matter including auto engines, incinerators and forest fires.

Term	Definition
Produced Gas	Gas that is associated with oil production.
Produced Water	Water extracted from a reservoir as a mixture with oil and gas.
Production Fluids	Gases or liquids (including hydrocarbons and produced water) recovered from wells.
Proven Area	The area described in Schedule "A" to the Proven Area Agreement dated July 21, 1944 between Imperial Oil Limited and His Majesty in Right of Canada, as amended and renewed from time to time. The Proven Area is where Imperial Oil conducts activities relating to its Norman Wells Operations. It measures 7,939 acres (32 km ²) in size and covers all of Goose Island, most of Bear and Frenchy's Islands, the six artificial islands and portions of the Mainland.
Receptor	A person, organism or component of the environment (e.g., air, water) that may be impacted by a hazard.
Reclamation	The process of returning a disturbed site to its natural state or one for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
Refinery	A facility where the refining and processing of raw hydrocarbons into saleable products such as gasoline occurs.
Regulators	The government departments or agencies that issue permits (licences) or authorizations likely to be applied for in response of a proposed project or existing operation.
Remediation	The management of a contaminated site to prevent, minimize, or mitigate damage to human health or the environment. Remediation may include both direct physical actions (e.g., removal, destruction, and containment of contaminants) and institutional controls (e.g., zoning designations or orders).
Representative Grab Sample	A grab sample consisting of equal portions of water collected from a minimum of two locations within one site.
Reservoir	A large natural or artificial area that is used to collect and store fluids (e.g. water) for use. Alternately, it can refer to the underground formation from which oil and gas are drawn.
Reservoir Pressure	The average pressure within a reservoir at any given time.
Response Framework	A systematic approach to responding when the results of an aquatic effects monitoring program indicate that an action level has been reached.
Revegetation	The process of providing land with a new cover of plants.
Risk	The possibility of injury, loss, or environmental incident created by a hazard. The significance of the risk is determined by the probability of an unwanted incident and the severity of its consequences.
Runoff	The part of water from rain and snow that flows overland to streams, ponds or other surface water bodies and that does not infiltrate into the ground or evaporate.
Sahtu Settlement Area	Refer to Section 9 Maps & Figures: Figure 1.1.
Scour	A form of soil erosion typically caused by water flow.
Sediments	Materials that settle to the bottom of a liquid.

Term	Definition
SLWB Registry	An online library of documents filed with the SLWB located at www.slwb.com . Documents are filed by company name and licence number.
Separation	The process of isolating components in streams of mixed fluids.
Species at Risk Act – Canada	Federal legislation protecting species which are at-risk of disappearing from Canada.
Species at Risk Act – NWT	Territorial legislation protecting species that are at-risk of disappearing from the Northwest Territories.
Specific conductivity	A material's ability to conduct electricity.
Stakeholders	Individuals, groups, or organizations that have an interest or concern in something. Often they can affect or be affected by the actions of others. Includes industry, federal agencies, the territorial government, Aboriginal governments and organizations, communities, and other interested parties.
Sump	A depression, low-lying area or excavated pit that can be a collection point for overland water flow or for collecting and containing fluids.
Supernatant Fluid	The liquid or fluid overlying materials present in the liquid lower layers or bottom sediments of a sump that are deposited by the settling or precipitation of solids.
Surface Casing	The largest diameter and shortest casing string in a well. It is used to protect freshwater aquifers and provide stability when drilling.
Surface Water	Water on the earth's surface, including fresh and salt water.
Surface Water Run-off Facilities	The Refinery Impound Basin, LT 11(or historic Battery 3) Impound Basin, Refinery Water Flood Basin, CPF Impound Basin, Miscellaneous Mainland Impound Areas, Miscellaneous Bear Island Impound Areas, Miscellaneous Goose Island Impound Areas, bunkers, and associated ditches or excavations provided for the collection, storage and discharge of surface run-off waters from the Imperial Oil Resources NWT Limited lease.
Surveillance Network Program	A series or network of devices or sampling points designed to test environmental conditions for comparison against baseline data obtained from a point or area designed as a control. This is a method of tracking and identifying the spread of deleterious substances in the environment.
Suspended Well	A well that has produced, but is now shut-in. It will either be put back on production or plugged and abandoned.
Taiga Plains	A terrestrial ecozone that covers most of the western NWT. Consists primarily of limestone, shale and sandstone sedimentary rocks, and has formed wide flat plains with rolling terrain throughout. The sedimentary layers contain some rich natural reservoirs of oil and gas. The western portion, dominated by the Mackenzie, is more rugged with deep canyons and trenches cut by the river and its tributaries.
Taiga Shield	A terrestrial ecozone that stretches across the subarctic region. It covers almost all of the eastern area of the NWT. Terrain is typically flat or rolling hills with thousands of depressions carved by glacial retreat now infilled, forming lakes, ponds, wetlands and other water features.
The River	The Mackenzie River.
Total Alkalinity	A measurement of water quality. Refers to the ability of the solution to neutralize acids to the equivalence point of carbonate or bicarbonate.

Term	Definition
Total Dissolved Solids	A measurement of water quality. Refers to the amount of all charged ions including minerals, salts, and metals that are dissolved in a sample of water.
Total Hardness	A measurement of water quality. Refers to the amount of carbonates, such as calcium and magnesium, in a sample of water.
Total Hydrocarbons	A measure of all airborne compounds containing only carbon and hydrogen.
Total Petroleum Hydrocarbons	Refers to the amount of petroleum hydrocarbons in a sample of liquid (e.g. water) or solid (e.g. soil).
Total Phosphorus	A measurement of water quality. Refers to the amount of phosphorus in a sample of water.
Total Suspended Solids	A measurement of water quality. Refers to the amount of solid material that is suspended in a sample of water.
Toxicity	The degree to which a substance is toxic to organisms.
Trace	A very small amount that is barely detectable.
Tulita district	Refer to Section 9 Maps & Figures: Figure 1.1.
Ultrasonic Corrosion Inspection	The use of ultrasonic pulse waves to detect corrosion of materials.
Volatile Organic Compound	Organic chemicals that have a high vapor pressure at ordinary, room-temperature conditions. Includes chemicals like benzene and acetone.
Waste	As defined by Section 2 of the Northwest Territories Waters Act.
Waste Management Plan	A document that outlines IOR processes for handling waste at its NWO.
Watercourse	A natural watercourse, body of water or water supply, whether usually containing water or not. Includes groundwater, springs, swamps, and gulches, as defined in the <i>Northwest Territories Waters Regulations</i> .
Waterflood	The injection of water into the Norman Wells oilfield reservoir for pressure maintenance and enhanced oil production.
Waters	An inland water, whether in a liquid or frozen state, on or below the surface of the land in the Northwest Territories.
Water Intake	The wet well pump and associated facilities installed in the Mackenzie River and the water line to the Central Processing Facility.
Water Licence	Imperial Oil's Type "A" Water licence from the Sahtu Land and Water Board, issued August 30, 2004. Licence Number S03L-001 as amended.
Water Quality	A description of the chemical, physical, or biological properties of water relative to a specific use or value, e.g., an environment for aquatic life or as a source for drinking water.
Well Servicing	The maintenance work done on an oil or gas well to improve or maintain the production from a formation already producing.

Acronyms, Symbols and Units

Acronym, Symbol or Unit	Definition
#	number
AANDC	Aboriginal Affairs and Northern Development Canada (previously known as Indian and Northern Affairs Canada)
AEMP	Aquatic Effects Monitoring Program
Ag	silver
Al	aluminum
APEC	area of proven or potential environmental concern
A&R	Abandonment & Reclamation
As	arsenic
B	boron
Ba	barium
bbl	barrel
Be	beryllium
BIT	Bear Island Terminal (there are four terminals on Bear Island: BIT 2, 3, 4 and 5)
BTEX	benzene, toluene, ethylbenzene and xylene
°C	degrees celsius
CCME	Canadian Council of Ministers of the Environment
Cd	cadmium
Cl	chloride
COPC	chemical of potential concern; refers to chemicals evaluated in a human health or environmental risk assessment
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPF	Central Processing Facility
Co	cobalt
Cr	chromium
Cr ⁶⁺	hexavalent chromium
Cu	copper
DFO	Department of Fisheries and Oceans
DGT	Diffusion Gradient Thin Films
DOC	Dissolved Organic Carbon
DPE	dual phase extraction; an in situ remediation method involving a combination of groundwater extraction and application of high vacuum to remove vapour phase hydrocarbon
EC50	half maximal effective concentration
ENR	Environment and Natural Resources, Government of the Northwest Territories
ERP	Emergency Response Plan
ESA	Environmental Site Assessment

Acronym, Symbol or Unit	Definition
ESD	Emergency Shutdown; describes a situation where equipment is shut down for unforeseen reasons
F ⁻	fluoride
Fe	iron
FIMS	IOR's Facilities Integrity Management System
Ft	feet
FWAL	fresh water aquatic life
GCDWQ	Guidelines for Canadian Drinking Water Quality
GIS	Geographic Information System
GIT	Goose Island Terminal (there are four terminals on Goose Island: GIT 4, GIT 7, 8 and 9)
GNWT	Government of the Northwest Territories
ha	hectare
Hg	mercury
ILI	In-Line Logging Inspection
INAC	Indian and Northern Affairs Canada (now known as Aboriginal Affairs and Northern Development Canada (AANDC))
IOR	Imperial Oil Resources N.W.T. Limited
JSA	Job Safety Analysis
km	kilometer; a unit of distance equal to 1000 metres
km ²	kilometers squared; a unit of area measurement equal to 100 hectares
LiDAR	Laser Interferometry Detection and Ranging
LPT	Land Pipeline Terminal
LT	Land Terminal
m ²	square metre; a unit of area measurement
m ³	cubic metre; a unit of volume measurement
m ³ /d	cubic metres per day; a unit of measurement of the flow of a liquid volume
m ³ /year	cubic metres per year; a unit of measurement of the flow of a liquid volume
MACA	Municipal and Community Affairs
mbgs	meters below ground surface
MFL	Magnetic Flux Leakage; a magnetic based inspection tool used to check for corrosion in steel structures such as pipelines
mg/kg	milligrams per kilogram; a unit of concentration in a solid
mg/L	milligrams per litre; a unit of concentration in a liquid
Mo	molybdenum
MPE	multi-phase extraction; an in-situ remediation method involving application of high vacuum to remove vapour phase and liquid hydrocarbons simultaneously through the same intake tube
mS/cm	millisiemens per centimetre
MVLWB	Mackenzie Valley Land and Water Board
MVRMA	Mackenzie Valley Resource Management Act
N/A	not applicable

Acronym, Symbol or Unit	Definition
Na	sodium
NAD 27	North American Datum 27
NDP	Northern Development Program
NEB	National Energy Board
NGL	natural gas liquids; condensate, butane, propane and ethane that have been removed from natural gas
Ni	nickel
NO ₃	nitrate
NO ₂	nitrite
NWO	Norman Wells Operations
NWT	Northwest Territories
NTPC	Northwest Territories Power Corporation
OIMS	IOR's Operations Integrity Management System
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyls
pH	the measure of a substance's acidity or alkalinity
PHC	petroleum hydrocarbon
PHC F1	CCME Petroleum Hydrocarbon Fraction F1, covering the range from C ₆ to C ₁₀
PHC F2	CCME Petroleum Hydrocarbon Fraction F1, covering the range from C _{>10} to C ₁₆
PHC F3	CCME Petroleum Hydrocarbon Fraction F1, covering the range from C _{>16} to C ₃₄
PHC F4	CCME Petroleum Hydrocarbon Fraction F1, covering the range from C _{>34} to C ₅₀₊
ppm	parts per million
QA/QC	quality assurance/quality control; procedures and controls designed to monitor the conduct, data quality and integrity of a study
RAP	remedial action plan
ROW	right of way; commonly used to describe the corridor for pipelines or flowlines.
SARA	Species at Risk Act
Se	selenium
SLUP	Sahtu Land Use Plan
SLUPB	Sahtu Land Use Planning Board
SLWB	Sahtu Land and Water Board
SNP	Surveillance Network Program
SPMD	semi-permeable membrane devices
SO ₄	sulphate
SSH&E	Safety, Security, Health and Environment
SVE	soil vapour extraction; an in-situ remediation method involving application of vacuum to remove vapour phase hydrocarbon

Acronym, Symbol or Unit	Definition
SWROF	Surface Water Run Off Facility
TDS	total dissolved solids
THC	total hydrocarbons
Tl	thallium
TK	Traditional Knowledge
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TSS	total suspended solids
U	uranium
V	vanadium
WLWB	Wek'èezhii Land and Water Board
WMP	Waste Management Plan
Zn	zinc