Upstream Oil and Gas Site Classification Tool

October 2009

1.0 Definitions

Note: If there is a difference between a definition in this classification tool and a definition approved under Ministry Procedure or Protocol, the Ministry approved definition shall apply.

"Act" means the *Environmental Management Act*, S.B.C. 2003, c. 53.

"aquatic habitat" means habitat defined in a protocol approved by the Director or as used by "aquatic life" as defined in the Regulation.

"**Commission"** means the Oil and Gas Commission.

"contaminant" means a substance causing contamination as defined in Part 4 of the Act.

"Director" means a person employed by the government and designated in writing by the minister as a director of waste management or as an acting, deputy or assistant director of waste management [under the Act].

"dense nonaqueous phase liquid" (DNAPL) means a nonaqueous phase liquid having a specific gravity greater than 1.0.

"exposure zone" means the zone in which humans or biota can come into direct contact with contaminants in the absence of measures to prevent exposure.

"high water mark" means:

a) for freshwater, means the visible high water mark of a stream where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the stream a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself, and includes the active floodplain; and

b) for marine water, a high water mark as defined by the Higher High Water Mean Tide by Fisheries and Oceans Canada and as mapped on Canadian Hydrographic Services navigational charts.

"light nonaqueous phase liquid" (LNAPL) means a nonaqueous phase liquid having a specific gravity less than 1.0.

"Manager" means an officer of the Commission delegated authority under section 84 of the *Petroleum and Natural Gas Act*.

"Ministry" means the Ministry of Environment.

"mobile DNAPL" means DNAPL that has moved in geologic media under prevailing site conditions (e.g. hydraulic gradients, geologic conditions). DNAPL is considered mobile when:

a) temporal sampling indicates advancement of DNAPL across a monitoring well network;
b) free liquid is found in monitoring wells at an apparent thickness greater than 2 mm; or
c) individual DNAPL substances are detected in water at concentrations exceeding 10% of their theoretical solubility limit.

"mobile LNAPL" means LNAPL has moved in geologic media under prevailing site conditions (e.g. hydraulic gradients, geologic conditions). LNAPL is considered mobile when:

a) LNAPL is present in fractured bedrock; or
b) LNAPL is measured over an area greater than $50m^2$ and at least one of the following applies:
    1. Seasonal water table fluctuations exceed 1 m (unless adequate seasonal data available to determine maximum LNAPL thickness);
    2. Hydraulic gradients exceed 0.01 m/m for soil compositions listed in Table 1;
    3. Preferential pathways intersect zones containing LNAPL and thicknesses exceed 0.3m;
c) temporal sampling indicates increasing thickness of LNAPL in monitoring wells;
d) temporal sampling indicates advancement of LNAPL across a monitoring well network; or
e) LNAPL is measured in monitoring wells over an area greater than $50m^2$ at thicknesses exceeding values indicated in Table 1 of this tool.

"offsite migration" means the migration of contaminants or other substances from a source parcel to a neighbouring parcel (an affected parcel) and where the source parcel and neighbouring parcel have different ownership or tenure.

"operator" has the same meaning as in the *Petroleum and Natural Gas Act*.

"receptor" means a living plant, animal or human that may be exposed to a substance.

"Regulation" means the Contaminated Sites Regulation (B.C. Reg. 375/96).

"upper cap concentration" means the concentration established in a protocol approved by the director of a substance with a numerical standard in the Regulation and which, when present in the exposure zone, poses a high risk to environmental or human health. Until such time as a protocol is in effect, the upper cap concentrations for this classification test are detailed within this document. (see Table 2.)

2.0 Introduction

Pursuant to the memorandum of understanding between the Oil and Gas Commission (OGC), Ministry of Environment (MoE), Ministry of Agriculture and Lands, and Ministry of Energy and Mines, this document outlines the Site Classification Tool to be used as the administrative threshold to determine if a site requires Ministry of Environment oversight. Sites designated as "priority" using this tool are considered to be "high risk" sites and require MoE oversight until the site is classified as "not high risk" by the MoE.

This document sets out simple, objective criteria for characterizing environmental and human health risk based on easily obtainable site information. These criteria have been developed in the context of the logistical challenges facing the Oil and Gas sector with assessing sites in remote locations. The OGC also recognizes that sites may not be fully delineated prior to the utilization of this tool. The OGC will allow for the inclusion of professional judgement into the data set used to evaluate the risk profile of a site.

Notwithstanding any of the conclusions drawn from the use of this Site Classification Tool, provisions laid out in the *Environmental Management Act* allow the Director of the MoE to require that a site be overseen by the MoE if the Director thinks that there is a risk to human health or the environment.

The Site Classification Tool is a stand-alone tool created by the OGC for the classification of Oil and Gas sites only. The authority to use this tool and oversee the management of Oil and Gas sites is derived from the provisions laid out in the *Petroleum and Natural Gas Act*, and a Memorandum of Understanding between the MoE and the OGC (2007).

The Site Classification Tool will allow for a reasonable classification of sites such that the OGC will be able to process Certificate of Restoration applications and manage environmental liability at Oil and Gas sites for the betterment of the general public and the Oil and Gas industry as a whole.

3.0 Procedure

3.1 Site information needs

The level of information necessary to evaluate all the site indicators of this tool and reach a classification for a site will vary on a site-by-site basis depending on the nature and extent of contamination, site geology and hydrogeology and site proximity to receptors. However, there is a basic level of information that is required to properly assess the classification for the site (see Appendix 3). All of this background technical

data should be available for presentation to the OGC should it be required. Attestations that this data is available and has been collected following the procedures laid out herein must be included in the site classification report. The OGC will randomly request the submission of this data at a frequency of 1 in 20 submissions. Proponents will be informed that they are to submit the background technical data following a review of their submission. The OGC may require background technical data to be submitted if deemed necessary following any site classification report submission.

Overall, care should be taken to ensure that the site classifications determined under this tool must be supported by appropriate, satisfactory site information obtained in accordance with relevant OGC and MoE procedures, protocols, guidance and standard professional practice.

3.2 Site classification

A site exceeding any threshold of this tool is classified as a "priority" site and will be considered by the OGC to constitute a "high risk" site until such time as the site is classified as "not high risk" by the Director of the MoE.

Site classifications for wells and facilities are based on industrial land use for all Oil and Gas sites unless there has been offsite migration of contamination onto a parcel of land that is currently zoned or otherwise designated for a future land use under an Official Community Plan. In such cases, the offsite contamination shall be classified based on the most protective land use of either the current or anticipated future potential land use as designated in the Official Community Plan. Site classifications for temporary disturbances associated with the drilling of the well such as remote sumps, borrow pits, and campsites that are no longer being used for operations shall be based on the anticipated current or future land use (i.e. current zoning, agricultural within the ALR, or wildland)

3.3 Priority Thresholds

Priority sites are not eligible for a Certificate of Restoration until the Director of the MoE has classified the site as "not high risk" and all of the requirements of the Certification of Restoration have been met. If any one or more of the following conditions occur at a site, it is considered to be "priority" site:

1. Mobile Non-aqueous Phase Liquids (LNAPL or DNAPL) are present at the site;
2. Substances within the top meter of soil exceed the upper cap concentrations for human intake of soil for the applicable land use, unless all soil exceeding upper cap concentrations for human intake will be removed or remediated to below upper cap concentrations within 90 days from the submission of the risk classification to the OGC.

3. Drinking water standards apply to groundwater at the site and substances in groundwater either:
   a. Exceed 10 times the upper cap concentrations for drinking water within 10 meters of a drinking water well; or
   b. Exceed the upper cap concentrations for drinking water within the well;
4. Substances in surface water either:
   a. Exceed 10 times the upper cap concentrations for drinking water within 100 meters upstream of a drinking water intake; or
   b. Exceed the upper cap concentrations for drinking water at the intake;
5. Substances in groundwater within 10 meters of the *high water mark* of an aquatic habitat exceed the upper cap concentrations for aquatic life water use;
6. Livestock or Irrigation water standards apply to groundwater at the site and substances in groundwater either:
   a. Exceed 10 times the applicable upper cap concentrations for water within 10 meters of a water supply well; or
   b. Exceed the upper cap concentrations for water within the well;
7. Substances in surface water either:
   a. Exceed 10 times the applicable upper cap concentrations for water within 100 meters upstream of a water supply intake; or
   b. Exceed the applicable upper cap concentrations for water at the intake;
8. Substances within the top meter of soil exceed the upper cap concentrations for toxicity to invertebrates and plants unless either:
   a. All soil exceeding upper cap concentrations for toxicity to invertebrates and plants will be removed or remediated to below upper cap concentrations within 90 days; or
   b. the operator can demonstrate to the satisfaction of the Commission that contamination at the site is contained in such a manner to prevent contaminant migration in soil, groundwater or surface water, and interim preventative measures (e.g. fencing, netting) have been implemented to prevent wildlife from ingesting contaminated soil; and the operator provides a remediation schedule and interim monitoring plan that is acceptable to the Commission.
9. Volatile substances included in the BC Contaminated Sites Regulation Schedule 11 originating from the site have been detected in soil or groundwater within 30 meters of an existing building that is not part of the onsite oil and gas infrastructure; and within this distance, at least one substance in soil vapour exceeds the upper cap concentrations for human inhalation for the applicable land use.
10. Volatile substances included in the BC Contaminated Sites Regulation Schedule 11 have been detected in soil or groundwater and the site is on a parcel of land that is currently zoned or otherwise designated for future use as parkland,

residential, or commercial property within an official community plan, and at least one substance in soil vapour exceeds the upper cap concentrations for human inhalation for the applicable land use.

4.0 Reporting requirements

4.1 Notification Triggers

Site classifications must be provided to the Manager whenever the operator makes any of the following submissions:

- a site investigation report required or ordered by the Manager;
- a Site Classification Report required by the Manager;
- a notification of independent remediation under section 54 of the Act;
- within 90 days of making a notification of offsite migration under section 57 or 60.1 of the Regulation. Exceptions to the timing of the reporting requirement will be considered on a site by site basis by the OGC, as the OGC recognizes that it may not be possible to immediately access a site to complete the necessary assessments required to complete the risk classification within 90 days of determining that offsite-migration has occurred at some difficult-to-access-sites; and
- a part 1 application for certificate of restoration if not previously submitted under one of the above triggers.

Site classification details are to be provided in the form of a Site Classification Report, in a format shown in Appendix 2.

All applications for Certificates of Restoration must explicitly state that the site is not a priority site as determined using this Site Classification Tool. A certificate of restoration will not be issued for a site unless it has been classified using this Site Classification Tool and is not designated as a priority site, or has been classified by the Director as not being High Risk.

4.2 Reporting details

The Site Classification Report contains three parts:

Part 1: Land, owner and agent information
Part 2: Investigation and site status information
Part 3: Professional signatures

An example of the Site Classification Report is included in Appendix 2.

5.0 Priority site remediation and reclassification

Priority sites must be managed in accordance with the requirements of the Ministry and may be reclassified as low to moderate risk in accordance with Ministry process.

6.0 Process Improvement

The volume of information and knowledge related to the assessment of environmental impacts is constantly expanding. Because of this the Commission is committed to making appropriate changes on an ongoing basis to increase the effectiveness and efficiency of processes and strategies and better manage environmental impacts. As such the Site Classification Tool may be revised from time to time to reflect the most recent regulatory definitions, processes, policies and protocols. The Commission will review the effectiveness of the Site Classification Tool within 3 years of implementation.

Table 1. LNAPL thickness considered mobile as a function of soil composition

Soil Type	Characteristic fraction	Percent fines (silt and clay)	LNAPL Thickness (m)
Coarse Sand or Gravel	>20% Coarse Sand	< 3	0.03
Coarse Sand or Gravel	>20% Coarse Sand	3-10	0.05
Medium Sand	Medium Sand	< 10	0.1
Fine Sand	Fine Sand	<10	0.2
Silty Sand	Sand	>10	0.3

Notes:
1. Scientific background information on methods and assumptions for determining the presence of mobile LNAPL is contained in "Guidance on assessment of light nonaqueous phase liquid mobility for site classification purposes in British Columbia", by Golder Associates Ltd.
2. Soil compositions are based on the Unified Soil Classification System.
3. Soil compositions falling outside listed soil types shall be assigned the soil type that most closely approximates the permeability characteristics of the soil. In the event of uncertainty, a coarser grained soil type shall be assigned. For soil types that are finer grained than silty sand, default to the parameters listed for silty sand.

Table 2. Upper cap concentrations [1]

Media and Pathway	Contaminated Sites Regulation Standards/Criteria	Upper Cap Multiplier	Notes
Human Health Protection			
Soil exposure	Schedule 4 Schedule 5, 10	10	2 3
Vapour exposure	Schedule 11,	100	4
Water exposure	Schedule 6 Schedule 10	1	5
Environmental Health Protection			
Terrestrial soil exposure	Schedule 4 Schedule 5	10	2 6
Aquatic life water exposure	Schedule 6	10	5
Livestock water exposure	Schedule 6	1	5
Irrigation water exposure	Schedule 6	1	5

Notes:

1. Upper cap concentrations are calculated by multiplying the appropriate *Contaminated Sites Regulation Standard* by the appropriate *Upper Cap Multiplier* listed for each *Media* and *Pathway*.
2. Upper cap concentrations for substances listed in Schedule 4 are provided in Appendix 1.
3. Reference soil standards are those for the applicable site land use.
4. Reference vapour standards are those for the applicable site land use.
5. The application of groundwater standards for the protection of specified water uses is to be determined in accordance with Technical Guidance 6, "Applying Water Quality Standards to Groundwater and Surface Water."
6. Where available in Schedule 5, soil ecological use includes soil use by soil invertebrates and plants, livestock (soil and fodder), and microbes. Reference soil standards are those for the applicable site land use.

APPENDIX 1

SCHEDULE 4 SUBSTANCES

UPPER CAP CONCENTRATIONS

Note: **If case of difference between the upper cap concentrations and those defined by Ministry Protocol, the Ministry approved concentration shall apply.**

Appendix 1. Upper cap concentrations for Schedule 4 substances of the Contaminated Sites Regulation[1]

COLUMN I Substance	COLUMN II Agricultural (AL) Human Health	COLUMN III Agricultural (AL) Ecological Health	COLUMN IV Residential Urban Park (RL/PL) Human Health	COLUMN V Residential Urban Park (RL/PL) Ecological Health	COLUMN VI Commercial (CL) Human Health	COLUMN VII Commercial (CL) Ecological Health	COLUMN VIII Industrial (IL) Human Health	COLUMN IX Industrial (IL) Ecological Health
INORGANIC SUBSTANCES								
antimony	150	200	150	200	400	400	25 000	400
beryllium	80	40	80	40	250	80	750	80
boron (hot water soluble)	65 000	20	65 000	NUCC[3]	200 000	NUCC[3]	200 000[2]	NUCC[3]
cobalt	6 500	400	6 500	500	20 000	3 000	200 000[2]	3 000
cyanide (WAD)[4]	6 500	5	6 500	100	20 000	1 000	200 000[2]	1 000
cyanide (SAD)[5]	NUCC[6]	50	NUCC[6]	500	NUCC[6]	5 000	NUCC[6]	5 000
fluoride	19 500	2 000	19 500	4 000	60 000	20 000	200 000[2]	20 000
molybdenum	1 500	50	1 500	100	5 000	400	200 000[2]	400
nickel	6 500	1 500	6 500	1 000	20 000	5 000	200 000[2]	5 000
selenium	1 500	20	1 500	30	5 000	100	200 000[2]	100
silver	1 500	200	1 500	200	5 000	400	200 000[2]	400
sulphur (elemental)	NUCC[6]	5 000	NUCC[6]	NUCC[3]	NUCC[6]	NUCC[3]	NUCC[6]	NUCC[3]
thallium	25	20	25	NUCC[3]	75	NUCC[3]	5 000	NUCC[3]
tin	200 000	50	200 000	500	200 000[2]	3 000	200 000[2]	3 000
vanadium	2 500	2 000	2 500	2 000	7 000	NUCC[3]	200 000[2]	NUCC[3]
MISCELLANEOUS INORGANIC AND ORGANIC SUBSTANCES								
Petroleum hydrocarbons								
VPHs[7]	55 000	2 000	55 000	2 000	150 000	2 000	200 000[2]	2 000
LEPHs[8]	25 000	10 000	25 000	10 000	75 000	20 000	200 000[2]	20 000
HEPHs[9]	45 000	10 000	45 000	10 000	150 000	50 000	200 000[2]	50 000

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ORGANIC SUBSTANCES								
Chlorinated Hydrocarbons								
Chlorinated aliphatics								
carbon tetrachloride	250	1	250	50	700	500	45 000	500
chloroform	3 000	1	3 000	50	10 000	500	200 000[2]	500
1,1-dichloroethane	65 000	1	65 000	50	200 000	500	200 000[2]	500
1,2-dichloroethane	6 500	1	6 500	50	20 000	500	200 000[2]	500
1,1-dichloroethene	15 000	1	15 000	50	50 000	500	200 000[2]	500
1,2-dichloroethene (cis)	3 000	1	3 000	50	10 000	500	200 000[2]	500
1,2-dichloroethene (trans)	6 500	1	6 500	50	20 000	500	200 000[2]	500
dichloromethane	20 000	1	20 000	50	60 000	500	200 000[2]	500
1,2-dichloropropane	350	1	350	50	1 000	500	70 000	500
1,3-dichloropropene (cis and trans)	9 500	1	9 500	50	30 000	500	200 000[2]	500
1,1,1-trichloroethane	65 000	1	65 000	50	200 000	500	200 000[2]	500
1,1,2-trichloroethane	1 500	1	1 500	50	4 000	500	200 000[2]	500
hexachlorocyclohexane (HCH gamma, lindane)	100	0.1	100	NUCC[3]	300	NUCC[3]	20 000	NUCC[3]
Chlorinated benzenes								
1,2-dichlorobenzene	30 000	1	30 000	10	90 000	100	200 000[2]	100
1,3-dichlorobenzene	9 500	1	9 500	10	30 000	100	200 000[2]	100
1,4-dichlorobenzene	35 000	1	35 000	10	100 000	100	200 000[2]	100
hexachlorobenzene	250	0.5	250	20	800	100	50 000	100
monochlorobenzene	6 500	1	6 500	10	20 000	100	200 000[2]	100
pentachlorobenzene	250	0.5	250	20	800	100	5 000	100

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Chlorinated benzenes continued								
1,2,3,4-tetrachlorobenzene	1 000	0.5	1 000	20	3 500	100	200 000	100
1,2,3,5-tetrachlorobenzene	150	0.5	150	20	400	100	25 000	100
1,2,4,5-tetrachlorobenzene	100	0.5	100	20	300	100	20 000	100
1,2,3-trichlorobenzene	5 000	0.5	5 000	20	15 000	100	200 000[2]	100
1,2,4-trichlorobenzene	3 000	0.5	3 000	20	10 000	100	200 000[2]	100
1,3,5-trichlorobenzene	500	0.5	500	20	1 500	100	95 000	100
Monocyclic Aromatic Hydrocarbons (MAHs)								
styrene	65 000	1	65 000	10	200 000	100	200 000[2]	100
Phenolic Substances								
Chlorinated phenols								
2-chlorophenol	1 500	0.5	1 500	5	5 000	50	200 000[2]	50
3-chlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
4-chlorophenol	3 000	0.5	3 000	5	10 000	50	200 000[2]	50
2,3-dichlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
2,4-dichlorophenol	1 000	0.5	1 000	5	3 000	50	200 000	50
2,5-dichlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
2,6-dichlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
3,4-dichlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
3,5-dichlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
2,3,4,5-tetrachlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
2,3,4,6-tetrachlorophenol	10 000	0.5	10 000	5	30 000	50	200 000[2]	50
2,3,5,6-tetrachlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50

Appendix 1. Upper cap concentrations for Schedule 4 substances of the Contaminated Sites Regulation[1]

COLUMN I Substance	COLUMN II Agricultural (AL) Human Health	COLUMN III Agricultural (AL) Ecological Health	COLUMN IV Residential Urban Park (RL/PL) Human Health	COLUMN V Residential Urban Park (RL/PL) Ecological Health	COLUMN VI Commercial (CL) Human Health	COLUMN VII Commercial (CL) Ecological Health	COLUMN VIII Industrial (IL) Human Health	COLUMN IX Industrial (IL) Ecological Health
Chlorinated phenols continued								
2,3,4-trichlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
2,3,5-trichlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
2,3,6-trichlorphenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
2,4,5-trichlorophenol	30 000	0.5	30 000	5	100 000	50	200 000[2]	50
2,4,6-trichlorophenol	35	0.5	35	5	100	50	6 500	50
3,4,5-trichlorophenol	NUCC[6]	0.5	NUCC[6]	5	NUCC[6]	50	NUCC[6]	50
Nonchlorinated phenols								
2-cresol (2-methylphenol)	15 000	1	15 000	10	50 000	100	200 000[2]	100
3-cresol (3-methylphenol)	15 000	1	15 000	10	50 000	100	200 000[2]	100
4-cresol (4-methylphenol)	1 500	1	1 500	10	5 000	100	200 000[2]	100
2,4-dimethylphenol	6 500	1	6 500	10	20 000	100	200 000[2]	100
2,4-dinitrophenol	650	1	650	10	2 000	100	150 000	100
2-methyl 4,6-dinitrophenol	35	1	35	10	100	100	6 500	100
2-nitrophenol	NUCC[6]	1	NUCC[6]	10	NUCC[6]	100	NUCC[6]	100
4-nitrophenol	2 500	1	2 500	10	8 000	100	200 000[2]	100
phenol	95 000	1	95 000	10	300 000	100	200 000[2]	100
Phthalic Acid Esters								
dibutyl phthalate (DBP)	30 000	300	30 000	NUCC[3]	100 000	NUCC[3]	200 000[2]	NUCC[3]
di (2-ethylhexyl) phthalate (DEHP)	6 500	300	6 500	NUCC[3]	20 000	NUCC[3]	200 000[2]	NUCC[3]

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Polycyclic Aromatic Hydrocarbons (PAHs)								
benz[a]anthracene	500	1	500	10	1 500	100	4 500	100
benzo[b]fluoranthene	500	1	500	10	1 500	100	4 500	100
benzo[k]fluoranthene	500	1	500	10	1 500	100	4 500	100
dibenz[a,h]anthracene	50	1	50	10	150	100	500	100
indeno (1,2,3-c,d) pyrene	500	1	500	10	1 500	100	4 500	100
naphthalene	6 500	1	6 500	50	20 000	500	200 000[2]	500
phenanthrene	NUCC[6]	1	NUCC[6]	50	NUCC[6]	500	NUCC[6]	500
pyrene	9 500	1	9 500	100	30 000	1 000	200 000[2]	1 000

1 All values in µg/g unless otherwise stated. Substances must be analyzed using methods specified in a director's protocol or alternate methods acceptable to a director.

2 Upper cap concentration calculated for substance and corresponding land use exceeds 200 000 µg/g (20%) therefore upper cap concentration has been established as 200 000 µg/g (20%).

3 NUCC – No upper cap concentration. No ecological health relevant, toxicity reference value (TRV) exists for the substance and corresponding land use, so no upper cap value is calculated.

4 WAD means weak acid dissociable.

5 SAD means strong acid dissociable.

6 NUCC – No upper cap concentration. No human health relevant, reference dose – ingestion (RfDo) or tolerable daily intake – ingestion (TDIo) exists for the substance and corresponding land use, so no upper cap value is calculated.

7 VPHs includes: volatile petroleum hydrocarbons with the exception of benzene, toluene, ethylbenzene, and xylenes.

8 LEPHs includes: light extractable petroleum hydrocarbons with the exception of benz[a]anthracene, benzo[a]pryrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, indeno (1,2,3-cd) pyrene, naphthalene, phenanthrene, and pyrene.

9 HEPHs includes: heavy extractable petroleum hydrocarbons with the exception of benz[a]anthracene, benzo[a]pryrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, indeno (1,2,3-cd) pyrene, naphthalene, phenanthrene, and pyrene.

APPENDIX 2

SITE CLASSIFICATION REPORT TEMPLATE

Site Classification Report

Part 1. Land, owner and agent information

Section I Land Description			
Site ID Number (if known)			
PID	or	PIN	
Legal Description			
Well authorization Number or Facility Number			
Latitude	Degrees	Minutes	Seconds
Longitude	Degrees	Minutes	Seconds
Site Civic Address	Street		
	City		Postal Code

Section II Site Owner and/or Operator			
Name			
Address	Street		
	City		Province/State
	Country		Postal /Zip Code
Phone		Fax	

Section III Environmental Consultant / Contractor / Agent Contact (if applicable)			
Name			
Address	Street		
	City		Province/State
	Country		Postal /Zip Code
Phone			Fax

Site Classification Reporting Trigger:
- Notification of Independent Remediation ☐
- Notification of offsite migration ☐
- Part 1 CoR application ☐
- Required by Manager ☐

Part 2. Investigation and site status

Section IV Site investigation status

A. Investigation status **Scheduled Completion Date**

1. historical review of contamination sources completed? ☐ yes ☐ no _____
2. site investigation for presence of contamination has been completed? ☐ yes ☐ no _____
3. delineation of contamination has been completed? ☐ yes ☐ no _____
4. Offsite migration of contamination identified? ☐ yes ☐ no _____

B. Priority Site Assessment

1. Are mobile non-aqueous phase liquids (LNAPL or DNAPL) present at the site? ☐ yes ☐ no
2. Do substances within the top meter of soil exceed the upper cap concentrations for human intake of soil for the applicable land use? ☐ yes ☐ no

   a. Will this soil be removed from the site or remediated within 90 days? ☐ yes ☐ no
3. Do drinking water standards apply to groundwater at the site? ☐ yes ☐ no

   If yes, does a substance in groundwater:

   a. Exceed 10 times the upper cap concentrations for drinking water within 10 meters of a drinking water well? ☐ yes ☐ no

   b. Exceed the upper cap concentrations for drinking water within the well? ☐ yes ☐ no
4. Substances in surface water:

   a. Exceed 10 times the upper cap concentrations for drinking water within 100 meters upstream of a drinking water intake? ☐ yes ☐ no

   b. Exceed the upper cap concentrations for drinking water at the intake? ☐ yes ☐ no
5. Do substances in groundwater within 10 meters of the *high water mark* of an aquatic habitat exceed the upper cap concentrations for aquatic life water use? ☐ yes ☐ no
6. Do Livestock or Irrigation water standards apply to groundwater at the site? ☐ yes ☐ no

   If yes, does a substance in groundwater:

   a. Exceed 10 times the applicable upper cap concentrations for water within 10 meters of a water supply well? ☐ yes ☐ no

   b. Exceed the upper cap concentrations for drinking water within the well? ☐ yes ☐ no
7. Do substances in surface water:

   a. Exceed 10 times the applicable upper cap concentrations for water within 100 meters upstream of a water supply intake? ☐ yes ☐ no

   b. Exceed the applicable upper cap concentrations for water at the intake? ☐ yes ☐ no

Part 2. Investigation and site status

Section IV Site investigation status

8. Have volatile and toxic substances originating from the site have been detected in soil or groundwater within 30 meters of an existing building that is not part of the onsite oil and gas infrastructure? ☐ yes ☐ no

If yes, does a substance in soil vapour:

a. Exceed the upper cap concentrations for human inhalation for the applicable land use within 30 meters of a building? ☐ yes ☐ no

9. Is the site zoned or otherwise designated within an Official Community Plan as parkland, residential or commercial use and at least one substance exceeds the upper cap concentrations for human inhalation for the applicable land use? ☐ yes ☐ no

10. Do substances within the top meter of soil exceed the upper cap concentrations for toxicity to invertebrates and plants? ☐ yes ☐ no

If yes, will:

a. All soil exceeding upper cap concentrations for toxicity to invertebrates and plants be removed or remediated to below upper cap concentrations within 90 days? ☐ yes ☐ no

or;

b. The contamination at the site is contained in a manner that will prevent migration into soil, groundwater or surface water and interim preventative measures (e.g. fencing, netting) have been implemented to prevent wildlife from ingesting contaminated soil;? ☐ yes ☐ no

Note: If the answer to 10.b. is yes then attach a description of the site and any preventative measures taken to ensure that the contamination will not migrate within soil, groundwater and surface water; a remediation schedule and interim monitoring plan for the site; as well as supporting site investigation information for Commission review.

This Site is classified:

☐ Priority site

☐ Not a priority site

☐ Not a priority site because immediate short-term remediation is being undertaken (Question 2a. or 10a. = yes)

☐ Requires Commission decision (Question 10b. = yes)

For Commission use only:

Based on the known information the Commission has classified this site as ☐ Priority site ☐ Not a priority site

Signature:_____ Date:_____

Part 3. Signatures

Section V Professional signatures

I confirm that the investigations referred to above have been conducted in accordance with approved procedures and guidance and standard professional practice. I confirm the above information to be true, based on current knowledge as of the date completed. Where data gaps may exist in the information that this classification is based upon, I have used my professional judgement. I confirm that I have demonstrable experience in conducting investigations of the type reviewed above.

Signature and Professional Seal

Print Name

Date completed (yy-mm-dd)

Please send your completed risk classification report to the following address:

Director of Waste Management and Reclamation
Oil and Gas Commission
100- 10003 110th Avenue
Fort St John, BC V1J 6M7

Fax (250) 261-2050

APPENDIX 3

GUIDANCE FOR INFORMATION AND DATA REQUIREMENTS

FOR REPORTS SUBMITTED IN SUPPORT OF SITE CLASSIFICATION

- All sites undergoing priority classification should have undergone an environmental site assessment meeting the technical requirements laid out in the OGC's COR part 1 form;
- All areas of potential (APECs) or known (AECs) environmental concern identified, should be investigated during the environmental site assessment;
- both soil and groundwater should be addressed at each site under consideration for priority classification;
- Every effort should be made to delineate the extent of soil and groundwater contamination at the site prior to the completion of the priority classification. The OGC recognizes that this may not be possible at all sites or at the stage at which the priority classification is completed, and this will be taken into consideration during the evaluation of the submission;
- All soil sampling completed during site assessment activities should follow the requirements included in MoE Technical Guidance Document 1;
- Groundwater use should be evaluated in accordance with MoE Technical guidance Document 8.
- If logistical constraints prevent the investigation of APECs or AECs during the site assessment, then these areas should be clearly noted in reports used for this risk classification and professional judgement used to estimate the potential effects of these areas on the priority classification. Sites with APECs or AECs that have not been assessed will be subjected to a greater level of scrutiny and the risk classification subjected to more rigorous evaluation by the OGC. As such, every effort should be made to assess these areas;
- The management of soil and groundwater samples should follow the guidelines laid out in the BC Environmental Field Sampling Manual;
- Composite samples are not acceptable for use in determining the priority classification of a site;
- The use of Extractable Petroleum Hydrocarbon (EPH) analysis (EPH 10-19 and EPH 19-32) in place of Light Extractable Petroleum Hydrocarbon and Heavy Extractable Petroleum Hydrocarbon analysis is acceptable for screening purposes but is not acceptable for confirmation of remediation.
- Groundwater travel times to all drinking water wells and surface water bodies, including ephemeral water bodies and swamps within the 1 km or 1.5 km AGI, as appropriate, should be determined and mentioned in the report;
- If available information indicates that downgradient surface water bodies within the AGI are used as a drinking water source with the intake located within 1 km downstream of the confluence or potential confluence of a contaminant plume and the surface water body, then surface water quality data should be included in the report;
- If the site boundaries of an Oil and Gas site are located within 1 km of residential, urban park, or agricultural land uses, then the property boundaries for the residential, urban park or agricultural land use should be clearly shown on all maps. As well, groundwater contamination travel times to these sites should be calculated and clearly noted in the report if these sites are downgradient from the Oil and Gas site.