



CLASSIFICATION AND TRANSPORTATION OF HYDROCARBON CONTAMINATED SOILS

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2015 RemTech Conference



Outline

TDG Classification

Changes to requirements - 2014

Classification of Crude oil contaminated soil

- Flammable
- Environmentally hazardous / Leachate toxic
- Provincial variations

Case Study

9 hazard classes

Classified by types of hazard



- Upstream consignors generally have flammable liquids such as crude oil or compressed gases such as liquefied petroleum gas.
- Downstream consignors have gasoline or diesel.

Classification

Class 1: Explosives	Designed to explode
Class 2: Gases	Materials under pressure (cylinder)
Class 3: Flammable	Liquids with a flashpoint ≤ 60.5 C
Class 4: Flammable	Solids that Ignite easily
Class 5: Oxidizers	Add oxygen, contribute to combustion
Class 6: Toxic	Injury if inhaled, swallowed or absorbed;
Class 7: Radioactives	Materials giving off radiation
Class 8: Corrosives	Can damage skin, metal, other materials
Class 9: Misc.	Substances not covered by 1-8

How do you classify?



How do you classify a crude oil spill?

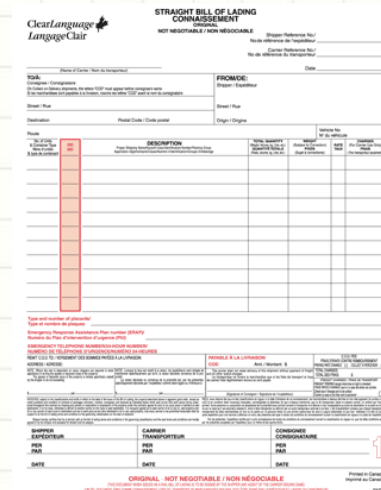
.... Why is this important?

Recent Changes to TDG

- Proof of Classification
- 1267/1268 - special provision 92 (lab tests)
- Consignor Certification
- UN number first in shipping name on shipping document / manifest



The image shows a 'Certificate of Analysis' form from Onigo. It includes fields for 'Product', 'Lot No.', 'Date of Analysis', and 'Analyst'. There is a section for 'Excluded the following substances' with a table for 'Product', 'Lot No.', and 'Date of Analysis'. The form also has a section for 'Signature of the Analyst' and 'Signature of the Consignor'.



The image shows a 'Straight Bill of Lading' form from OceanLanguage. It includes fields for 'Shipper', 'Consignee', 'Port of Origin', 'Port of Destination', 'Vessel Name', 'Bill of Lading Number', and 'Date of Issue'. There is a section for 'Description of Goods' with a table for 'Description', 'Quantity', 'Unit of Measure', and 'Weight'. The form also has a section for 'Signature of the Shipper' and 'Signature of the Consignee'.

Transition period is over!

Classifying a crude oil spill

If it's on the ground, and flammable:

UN 3175 Solids Containing Flammable Liquid,
NOS* (Petroleum Crude Oil), class 4.1, pg. II



Flammable liquid:
Flashpoint < 60.5 C

Flammable solid:
Fails rope burn test

**That was
EASY!**



Or was it?

What tests do we do for flammability?

Are there provincial variations?

How do I classify it if its not flammable?

What about BTEX?

..... I'm getting confused

Testing for flammable solids

JURISDICTION	REQUIRED TEST	REGULATION
Transport	Rope burn test	Transportation of Dangerous Goods Act and Regulations
British Columbia	Rope burn test	Hazardous Waste Regulation
AB Industrial and Downstream	Closed cup flashpoint test (disconnect stirrer)	Waste Control Regulation
AB Upstream	Closed cup flashpoint test (disconnect stirrer)	Directive 58
Saskatchewan	Rope burn test	Hazardous Substance and Waste Dangerous Goods Regulation
Manitoba	Rope burn test	The Dangerous Goods handling and Transportation Act

How is BTEX regulated?

Old TDG (Pre Clear Language) – Schedule II list II

Shipping Name	PIN	Classification
Benzene	UN 1114	3.2 (9.2)
Xylene	UN 1307	3.2 (9.2)

Exemptions : 2.3(k)

env. haz. substances that are included in div 2 of class 9 that are waste and (iv) in qty less than 0.01 percent by mass...

2003 Clear Language TDG

1 shipping name for solids:

UN 3077 Environmentally hazardous substance, solid, NOS* (_____)

Appendix 4 and 5 for parameters and levels



Class 9: 2003 Classification

Appendix 4: Leachate Toxic Waste

Element	EPA Threshold Limit (ppm)	Baseline – prior to sorbent addition (ppm)	Test – with sorbent addition (ppm)
Arsenic	5.0	<0.04	<0.04
Barium	100.0	0.814	0.313
Cadmium	1.0	<0.04	<0.04
Chromium	5.0	0.030	<0.007
Lead	5.0	0.513	0.096
Mercury	0.20	0.095	0.078
Selenium	1.0	<0.07	<0.07
Silver	5.0	3.835	3.291

US EPA Method 1311
Toxicity Characteristic
Leaching Potential (TCLP)

Generally 100 X DWG

Appendix 5: Environmentally hazardous substances

*destined for disposal; 179 substances

2008 TDG amendment 6

Removed from TDG:

Appendix 4 (Leachate Toxic Waste) and
Appendix 5 (Environmentally Hazardous Substances
Intended for Disposal) were removed
**....essentially eliminating the classification
of wastes as different from other DG's**



Do we still need to test for these substances?

Classification Criteria

Jurisdiction	Transportation of Dangerous goods version	Classification Notes
Transport Canada	Clear Language – amendments to July 2015	Dangerous Goods; classes 1 – 8; some class 9 (PCB, asbestos)
Environment Canada		Appendix 4 and Appendix 5; Environmentally hazardous and Leachable toxic waste
British Columbia	Clear Language TDG	Specific leachate criteria Hazardous waste if > 3 % HC
Alberta	Pre-Clear language plus leachate criteria	Old TDG schedule I in User Guide for Waste Managers
Saskatchewan	Clear Language TDG	
Manitoba	Pre-Clear language TDG	

Testing for BTEX

JURISDICTION	Required Test	Notable
Transport Canada	Not regulated if not flammable	2008 – tables removed from TDG
Environment (CEPA)	Benzene – TCLP leachate TEX – total con.	Applicable if crossing Provincial or Federal borders
British Columbia	Modified leachate extraction procedure	Requirements based upon 100 x drinking water standard
Alberta	TCLP	If non-flammable, crude contaminated soil is also non-hazardous (non-DOW)
Saskatchewan	Not regulated if not flammable	Based upon Clear Language TDG
Manitoba	Total concentration	Based on pre-Clear Language TDG

Say what?

Each jurisdiction has different criteria for:

- The TDG version used
- Required tests
- Parameter levels
- Additional classification
- Documentation

..... I'm really confused



Regulatory Levels for Xylene

	Test Method	Flammability	Xylene (if not flammable)
TDG	Class 3 Flashpoint Class 4 Rope burn	< 60 C Non-flammable	Not a dangerous good
BC HWR	Class 3 Flashpoint Class 4 Rope burn Class 9 TCLP	< 60 C Non-flammable	30 mg/L
AB WCR	Class 3 Flashpoint Class 4 Flashpoint Class 9 TCLP	< 61 C < 61 C	0.5 mg/L
SK WDG	Class 3 Flashpoint Class 4 Rope burn Class 9 Total conc.	< 61 C Non-flammable	100 mg/kg
Environment Canada	Class 3 Flashpoint Class 4 Rope burn Class 9 Total conc.	< 60.5 C Non-flammable	100 mg/kg

Classification Exercise

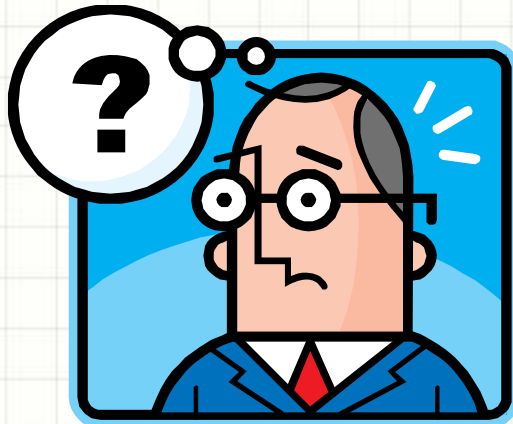
An environmental consultant has tested diesel contaminated soil and has the following results:

- Hydrocarbon 63,000 mg/kg (F1 – F4)
- Flashpoint > 75 C; Rope burn test: pass
- Xylene 160 mg/kg; 0.65 mg/L (TCLP)

Is this TDG regulated? Hazardous Waste? If so, in which jurisdictions? What would the classification and shipping name be in each jurisdiction in Western Canada?

* TDG information: Diesel Fuel, UN 1202, class 3, pg. III

Questions:



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