



## Montana Pollutant Discharge Elimination System Petroleum Cleanup General Permit Fact Sheet ▪ MTG790000

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Permit Number:	MTG790000
Receiving Water:	Statewide Areas of Montana (except Indian reservations)
Facilities:	
Facility Contact:	Applicants
Fact Sheet Date:	May 2025

### I. Summary

The Department of Environmental Quality (DEQ) proposes to renew the Montana Pollutant Discharge Elimination System (MPDES) Petroleum Cleanup General Permit (PCGP), MTG790000. This fact sheet documents the legal requirements and technical rationale that serve the decision-making process involved with developing effluent limits, monitoring and reporting requirements, and special conditions specific to petroleum cleanup.

#### A. Permit Status

The PCGP was first issued in 1992 and was most recently renewed in 2020.

#### B. Proposed Permit Changes

For this permit renewal, DEQ proposes to reissue the 2020 permit without substantive changes. However, this fact sheet has been updated to reflect changes made in response to comments regarding the assessment of BTEX (the sum of benzene, toluene, ethylbenzene, and xylenes) limits based on the individual nondegradation criteria for each of these parameters. Further, DEQ has removed generic narrative prohibitions consistent with the ruling in *City and County of San Francisco v. EPA*, 145 S. Ct. 704 (2025).

### II. Description of Discharge and Discharging Facilities

#### A. Background Information

Petroleum cleanup discharges originate from corrective actions involving the cleanup of gasoline, diesel fuel, kerosene, jet fuel, heating oil, other petroleum products, or the cleanup of sites related to the transportation of these materials (including pipelines). Wastewater from petroleum cleanup corrective actions may include surface and/or ground water resulting from excavation activity, remediation activity, surface and/or ground water contaminated by spills, or ground water resulting from pumping and/or monitoring aquifers.

The volume and source of discharges resulting from petroleum cleanups are expected to be highly variable. Discharges are often intermittent over the duration of the project, but may be continuous for several years. Based on available data, the following sections briefly describe the nature of the discharges that would be expected.

#### B. Treatment Technologies

Technologies commonly employed at petroleum cleanup sites include carbon adsorption in combination with oil/water separators and air stripping units. Air stripping is the process of moving air through contaminated groundwater or surface water to remove volatile organic compounds (VOCs) by changing them from a liquid to a vapor. There are several methods of air stripping including diffused aeration, tray aerators, spray basins, and packed towers. The Environmental Protection Agency (EPA) estimates that the potential removal efficiency of BTEX (the sum of benzene, toluene, ethylbenzene, and xylene isomers)

using an air stripper unit is 99.5 percent. Due to the high volatility of many of the soluble constituents in gasoline and other petroleum products that remain in contaminated water, air stripping is a proven, efficient, and cost-effective treatment technology.

In some cases, volatilized pollutants may require additional treatment, such as vapor phase carbon adsorption, to control pollutant discharges to air. Carbon adsorption uses activated carbon and inert solid adsorbent material to remove contaminants from water and process gas-phase streams.

### C. Existing Permit Requirements and Covered Facilities

Currently, two authorizations are effective under the PCGP: a railroad company recovering diesel fuel from ground water and a ground water remediation project from previously established gas station underground storage tanks (UST). The railroad facility uses granular activated carbon to treat wastewater before discharging to surface water. The UST remediation project uses an air stripper followed by a granular activated charcoal (GAC) canister.

Table 1 summarizes the 2020-permit limits and effluent characteristics of the railroad diesel recovery site for the period of record (POR) May 2020 to January 2025, during which the permittee reported three discharge events (November 2021, November 2023, and December 2024). The UST remediation project reported no discharges for the period of record.

Due to an administrative error, the limit set for the 2020-issued permit was incorrectly coded into the Integrated Compliance Information System (ICIS) such that total BTEX was listed in lieu of separate effluent limitations for Toluene, Ethylbenzene, and Xylenes and the limit for oil & grease was incorrectly listed as 10 mg/l. For this reason, two exceedances of the oil & grease limit of 4.0 mg/l (during the November 2021 and November 2023 discharge events) were overlooked. All ICIS coding will be corrected in this permit term.

<b>Table 1: Effluent Characteristics for MTG790013: Burlington Northern Santa Fe Railway</b>						
<b>Parameter</b>	<b>Units</b>	<b>2013 Maximum Daily Permit Limit <sup>(1)</sup></b>	<b>2020 Maximum Daily Permit Limit<sup>(1)</sup></b>	<b>Maximum Value</b>	<b>Average Value</b>	<b>Sample Size</b>
Benzene	µg/L	0.5	0	<0.5 <sup>(2)</sup>	<0.5 <sup>(2)</sup>	3
Total BTEX <sup>(3)</sup>	µg/L	100	<sup>(4)</sup>	<1	<0.8	3
Toluene <sup>(4)</sup>	µg/L	NA	9	<sup>(4)</sup>	<sup>(4)</sup>	0 <sup>(4)</sup>
Ethylbenzene <sup>(4)</sup>	µg/L	NA	10	<sup>(4)</sup>	<sup>(4)</sup>	0 <sup>(4)</sup>
Xylenes, Total <sup>(4)</sup>	µg/L	NA	100	<sup>(4)</sup>	<sup>(4)</sup>	0 <sup>(4)</sup>
MTBE <sup>(4,5)</sup>	µg/L	12	3	1 <sup>(2)</sup>	0.7 <sup>(2)</sup>	3
pH	s.u.	6.0 – 9.0	6.0 – 9.0	7.0-8.5 <sup>(6)</sup>	8	3
Oil & Grease	mg/L	4	4	5.6	3.9	3
Flow Rate	mgd	monitoring required	monitoring required	0.006	0.004	3
<sup>(1)</sup> The maximum value allowed in any single sample <sup>(2)</sup> All values were below the required reporting value <sup>(3)</sup> The sum of benzene, toluene, ethylbenzene and xylene (meta, ortho and para) isomers <sup>(4)</sup> In the 2020 permit, BTEX limits were replaced with individual limits for benzene, toluene, ethylbenzene, and xylenes, total. Due to an administrative error, these limits were not properly coded in the discharge monitoring reports (DMRs). Therefore, no data are available for these individual parameters for the period of record. <sup>(5)</sup> Methyl tertiary-butyl ether <sup>(6)</sup> Range of pH values reported during the period of record						

### III. Permit Applicability

#### A. Coverage Area

The PCGP applies to all areas of the State of Montana, except Indian Reservations.

#### B. Sources Eligible for Coverage

Petroleum cleanup discharges from corrective actions involving above ground or underground storage tanks used to store gasoline, diesel fuel, kerosene, jet fuel, heating oil, or the transportation of these materials (including pipelines) are eligible for coverage under this general permit. This may include surface and/or groundwater resulting from excavation or remediation activity, surface and/or ground water contaminated by spills, or ground water resulting from pumping and/or monitoring aquifers. Other petroleum cleanup activities may be covered if they meet the requirements of the PCGP.

#### C. Sources Excluded from Coverage

DEQ may deny an application for discharge under the PCGP for the following:

1. The discharger is unable to comply with:
  - a. Effluent limits or other terms and conditions of the permit, including those listed in the Special Conditions;
  - b. Water quality standards; or
  - c. Discharges that the regional administrator has objected to in writing.
2. The discharge is different in degree or nature than those described in the PCGP.
3. The same operation has previously been denied or revoked an MPDES permit or authorization.
4. The discharge is also included within an application, or is subject to review, under the Major Facility Siting Act.
5. The proposed point sources are in an area of unique ecological or recreational significance. Such determinations are based upon:
  - a. Montana stream classifications;
  - b. Impacts on fishery resources;
  - c. Local conditions at proposed discharge sites; and
  - d. Areas designated wilderness or wild and scenic rivers.
6. The facility discharges to waters classified as A-Closed, as these waters are typically used for drinking water. No increase above naturally occurring turbidity and no change in dissolved oxygen, pH, and temperature are allowed in this water classification, so it would not be cost-effective to treat wastewater from petroleum cleanup activities to these levels.
7. The discharge contains lead from a historic leaded gasoline spill or from another source.
8. The proposed receiving water is on the 303(d)-impairment list for any pollutant of concern in this permit

**Volatiles, acid compounds, and base/neutral compounds** – Prior to any discharge, the applicant must submit applicable surface water and/or groundwater analyses including all parameters in 40 Code of Federal Regulations (CFR) Part 122, Appendix D, Table II, excluding pesticides (see Appendix A at the end of this fact sheet). Laboratory analytical results must meet the RRVs in Circular DEQ-7. If the analyses demonstrate that toxic pollutants are present above water quality standards, other than what is expected in petroleum cleanup fuels, discharge is prohibited under this PCGP.

**Lead** – Tetraethyl lead was used as an additive in gasoline before it was phased out by EPA in 1995, and may be present at some historic petroleum sites. If the petroleum cleanup site seeking authorization was active before or during 1995, a lead sample analysis must be submitted prior to discharge. If lead is known to be present, discharge is prohibited under this PCGP.

**Water Treatment Additives** – This permit does not authorize the discharge of water treatment additives, for conditioning or treatment of wastewater, without written approval from DEQ. In the event a permittee

proposes to utilize a water treatment additive, the permittee shall submit to the agency a request, including the Material Safety Data Sheets (MSDS), for review.

If a permittee is denied authorization under the general permit, they may apply for authorization under the individual MPDES permit requirements by submitting the required forms and fees.

#### **D. Requirements for Authorization**

**Notice of Intent (NOI) Package** – A complete NOI package includes a complete NOI-79 form, any supplemental information requested on the NOI-79 form, and applicable fees (specified in ARM 17.30.201).

**Dischargers seeking continued coverage** must submit a complete renewal request (NOI package) within 30 days of the effective date of this permit including:

- Petroleum Cleanup Notice of Intent Form (NOI-79);
- Renewal fee for each outfall;
- Topographic map extending at least one mile beyond the property boundaries or operations site;
- Material Safety Data Sheets for water treatment additives being used, if applicable; and
- A Montana Sage Grouse Habitat Conservation Program consultation letter, if applicable.

**New sources** seeking coverage must submit an NOI package for the PCGP at least 30 days prior to construction or operation, which includes:

- Petroleum Cleanup Notice of Intent Form (NOI-79);
- Application fee for each outfall;
- Topographic map extending at least one mile beyond the property boundaries or operation site;
- Material Safety Data Sheets for water treatment additives being used, if applicable;
- A Montana Sage Grouse Habitat Conservation Program consultation letter, if applicable;
- A process flow diagram showing water flow through the treatment system;
- Laboratory analysis for potential contaminants listed in 40 CFR Part 122, Appendix D, Table II excluding pesticides (see Appendix). If the site was active before or during 1995, include additional laboratory results for lead. All analysis must be completed using approved methods in 40 CFR 136 and must meet the Required Reporting Values (RRVs) in Circular DEQ-7;
- Analysis from consultation with the Montana Natural Heritage Program; and
- Analysis from consultation with the Montana State Historic Preservation Office.

**Permittees requesting a modification** must submit an NOI package including:

- Petroleum Cleanup Notice of Intent Form (NOI-79);
- Modification fee for each modified outfall;
- Any additional information regarding, or effected by, the modification request

Facilities eligible for coverage will be issued a letter of authorization to the owner or operator of the facility. If the facility does not qualify for coverage, DEQ will notify the applicant. The applicant may then apply for an individual permit or modify the operation and re-apply for coverage under the PCGP.

#### **E. Terminating Authorization**

Authorizations remain in effect unless DEQ receives a written notice, or a Request for Termination (RFT), from the permittee notifying the department that the authorization should be terminated. This notice must be signed and certified according to the signatory requirements in III.N. of the permit and all applicable fees must be paid. Failure to submit a written notice of termination shall result in accrual of annual fees.

#### **F. Transferring Permit Coverage**

Permit coverage may be transferred to a new owner or operator in conformance with Part III.O.3. of the general permit. A Permit Transfer Notification (PTN) form and the applicable minor modification fee must be submitted to the department at least 30 days prior to the anticipated date of transfer.

#### IV. Proposed Effluent Limitations

The Montana Department of Environmental Quality has adopted general treatment requirements that establish the degree of wastewater treatment required to restore and maintain the quality of surface waters (ARM 17.30.635). This rule states that the degree of wastewater treatment is based on the surface water quality standards; the State’s nondegradation policy; present and anticipated beneficial uses of the receiving water; the quality and flow of the receiving water; the quantity and quality of sewage; industrial wastes and other wastes to be treated; and the presence or absence of other sources of pollution in the same watershed.

##### A. Technology-Based Effluent Limits (TBELs)

**Applicable Guidelines** – Technology-based effluent limits represent the minimum treatment requirements implemented in MPDES permits. TBELs are derived from national Effluent Limitation Guidelines (ELGs), standards established by EPA, and/or the permit writer using best professional judgement on a case-by-case basis. ELGs have not been promulgated for discharges for ground water cleanup/petroleum recovery facilities. However, the EPA has published TBELs for underground storage tank cleanup sites based on best professional judgment (BPJ). The technology basis used to develop these TBELs is free product recovery followed by air stripping, with or without carbon adsorption.

**Technology-Based Effluent Limits** – A traditional industry approach to limiting parameters associated with gasoline or other fuel oils has been to limit BTEX. EPA has established BTEX as the indicator parameter in discharges from gasoline and petroleum release sites because the composition of gasoline is highly variable and any one of the four BTEX constituents (benzene, toluene, ethylbenzene, and xylene) can be predominant. The established TBELs for pH, benzene, and total BTEX, based on the level of performance for air stripping, are listed in Table 3 below.

Table 3. Technology-Based Effluent Limits			
Parameter	Units	Effluent Limits	
		Daily Average	Daily Max
Benzene	µg/L	5	5
Total BTEX <sup>(1)</sup>	µg/L	100	100
pH	s.u.	6.0 – 9.0 (instantaneous)	

<sup>(1)</sup> The sum of benzene, toluene, ethylbenzene and xylene (meta, ortho and para) isomers

##### B. Water Quality-Based Effluent Limits (WQBELs)

**Applicable Guidelines** – The Montana Water Quality Act states that a permit may only be issued if DEQ finds that it will not result in pollution of state waters. MPDES permits shall include limitations on all pollutants which will cause, or have reasonable potential to cause, an excursion of any numeric or narrative water quality standard. WQBELs are designed to protect these standards and are required when TBELs are not adequately protective. The purpose of this section is to provide a basis and rationale for establishing effluent limits that will protect designated uses of the receiving water based on Montana water quality standards and water use classifications.

**Mixing Zones** – No mixing zones are authorized under the PCGP. All effluent limits must be met at the end of the discharge pipe before the effluent reaches state waters.

**Applicable Water Quality Standards & Pollutants of Concern** – Discharges from petroleum cleanup activities must comply with general prohibitions found at ARM 17.30.637 which require that state waters, including mixing zones, must be free from substances attributable to discharges that will:

- (a) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;
- (b) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter), or globules of grease or other floating materials;

- (c) produce odors, colors or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;
- (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and
- (e) create conditions which produce undesirable aquatic life.

WQBELs are evaluated for pollutants of concern (POCs) based on water quality standards applicable to the receiving water at the point of discharge. The applicable standards and nondegradation criteria for POCs at petroleum cleanup sites are summarized in Table 4.

<b>Table 4. Water Quality Standards Specific to Petroleum Cleanup</b>					
<b>Parameter</b>	<b>Units</b>	<b>Category</b>	<b>Human Health Standard</b>	<b>Nondegradation Criteria</b>	<b>Required Reporting Value (RRV)</b>
Benzene	µg/L	Carcinogen	5	0	0.6
Toluene	µg/L	Toxic	57	9	1
Ethylbenzene	µg/L	Toxic	68	10	1
Xylenes, total	µg/L	Toxic	10,000	1,500	3
MTBE	µg/L	Harmful	30	3	1
Oil and Grease	mg/L	Narrative	10	4	1

**Nondegradation** – The Montana Water Quality Act includes a nondegradation policy that prohibits degradation of state waters and applies to any new activity resulting in a change to existing water quality. The nondegradation values in Table 4 are calculated using rules set forth in ARM 17.30.715 based on the category of the pollutant.

**Benzene** - The nondegradation criterion for carcinogenic parameters is “...less than or equal to the concentrations of those parameters in the receiving water” or no increase above background. Since benzene is not considered a natural background parameter, the nondegradation criterion is zero (0).

**Toluene, Ethylbenzene, and Xylenes** – The criterion for toxic parameters states that the resulting concentration from a discharge cannot exceed fifteen percent of the lowest applicable standards.

**MTBE** – Discharges of harmful parameters must not create a change in surface water above ten percent of the applicable standards when existing water quality is less than forty percent of the standard. MTBE is not considered to be a natural background parameter. Therefore, the nondegradation criteria is set at ten percent of the 30 µg/L standard.

**Oil and Grease** – Changes in water quality for any narrative standards must not have a measurable effect on existing or anticipated uses, or cause measurable changes in aquatic life or ecological integrity. The previous permit set the nondegradation value for oil and grease at 4.0 mg/L. This value will be retained in this permit.

Based on these nondegradation criteria and their implementation in developing limits, DEQ determined discharges under this PCGP are nonsignificant.

## V. Final Effluent Limitations

**pH** – The technology-based limit of 6.0 – 9.0 s.u. is sufficiently protective of water quality. No additional WQBELs are required for this parameter.

**Oil and Grease** – Due to the large number of chemicals contained in refined petroleum products, the measurement of all component chemicals is not practical, cost effective, or necessary for attainment of

water quality standards. The oil and grease effluent limit of 4.0 mg/L, based on narrative standards and nondegradation criteria, is retained in this permit. Daily visual monitoring will also be required for periods of discharge. If visual monitoring indicates the presence of oil and grease, additional samples must be submitted for analysis and discharge must cease if the concentration is found to be greater than 4.0 mg/L.

The EPA recommended methods for testing oil and grease and total petroleum hydrocarbons (TPH) are methods 1664A and 1664B. To obtain only the non-polar material (NPM), including straight and branched chain hydrocarbons and other chemical substances, the silica-gel treated, hexane extractable material (SGT-HEM) procedure must be used. Permittees must request the SGT-HEM procedure when submitting a sample to the laboratory to obtain the NPM component of oil and grease (some laboratories call the SGT-HEM procedure the TPH by 1664A procedure).

**Benzene-** The nondegradation criterion for benzene (0 µg/L) is more stringent than the technology-based limit of 100 µg/L total BTEX. The final effluent limitation for benzene will be maintained at 0 µg/L, however reporting a non-detect result that meets the RRV (0.6 µg/L) is considered to be in compliance with the benzene limit.

**Toluene & Ethylbenzene** - These pollutants are constituents of BTEX, for which the technology-based limit of 100 µg/L total BTEX is more stringent than the sum of the nondegradation criteria for WQBELs as individual pollutants. However, when taken in aggregate this may allow for exceedances of the individual criteria. For this reason, the final effluent limits for Toluene and Ethylbenzene will be set at the nondegradation criteria of 9 µg/L and 10 µg/L, respectively.

**Xylenes-** The nondegradation criteria for xylenes, which are classified as toxic pollutants and based on the Human Health standard is 1,500 µg/L. Because this is less stringent than the technology-based limit of 100 µg/L total BTEX, the final effluent limit will be 100 µg/L.

**MTBE** – MTBE is a common fuel additive found in gasoline and may be present on petroleum cleanup sites. The more stringent nondegradation limit of 3.0 µg/L for MTBE will be used in this permit.

Average monthly limits are not established in this permit as they may not comply with the maximum daily nondegradation criteria. The following table summarizes the final effluents discussed above:

Table 1. Final Effluent Limits		
Parameter	Units	Maximum Daily Limit <sup>(1)</sup>
Benzene	µg/L	0 <sup>(2)</sup>
Toluene	µg/L	9
Ethylbenzene	µg/L	10
Xylenes, Total	µg/L	100
MTBE	µg/L	3
pH	s.u.	6.0 – 9.0
Oil and Grease	mg/L	4
<sup>(1)</sup> The maximum value allowed in any single sample <sup>(2)</sup> Reporting non-detect with analysis that meets the RRV (0.6 µg/L) is considered in compliance with the benzene limit		

## VI. Self-Monitoring and Reporting Requirements

Monitoring will start with the date of the authorization letter and is required during periods of discharge. All analytical procedures must comply with the specifications of 40 CFR Part 136. All dischargers must submit NetDMR results for each month by the 28<sup>th</sup> of the following month. Permittees shall monitor the effluent quality at the end of the discharge pipe before it enters state waters. The monitored parameters and frequency requirements are presented in Table 6. If no discharge occurs during the reported period, “no

discharge” shall be reported on the NetDMR. The samples collected and analyzed must be representative of the volume and nature of the facility’s discharge. The RRV is DEQ’s best determination of a level of analysis that can be achieved using EPA-approved methods or methods approved by DEQ.

<b>Table 2. Monitoring and Reporting Requirements <sup>(1)</sup></b>				
<b>Parameter</b>	<b>Units</b>	<b>Sample Type <sup>(2)</sup></b>	<b>Minimum Frequency <sup>(3)</sup></b>	<b>RRV <sup>(4)</sup></b>
Effluent Flow	mgd	Instantaneous	1/Day	--
Benzene	ug/L	Grab	1/Week	0.6
Toluene	ug/L	Grab	1/Week	1.0
Ethylbenzene	ug/L	Grab	1/Week	1.0
Xylenes, Total	ug/L	Grab	1/Week	3.0
MTBE	ug/L	Grab	1/Week	1.0
Oil and Grease <sup>(5)</sup>	yes/no	Visual <sup>(6)</sup>	1/Day	--
	mg/L	Grab	1/Week	1.0
pH	s.u.	Grab	1/Week	0.1
<p><sup>(1)</sup> All parameters must be reported as daily maximum  <sup>(2)</sup> See definition section at the end of permit for explanation of terms  <sup>(3)</sup> <b>Monitoring is required only for any calendar period where there is discharge</b>  <sup>(4)</sup> Required Reporting Value. If reporting non-detect, analysis must achieve these, or lower, RRVs  <sup>(5)</sup> Use Method 1664A or Method 1664B and specify the SGT-HEM procedure  <sup>(6)</sup> If visual monitoring indicates the presence of hydrocarbons, by sheen, odor, or other sign, the permittee is required to take corrective action as specified under the Special Conditions of this permit, including analyzing an additional grab sample under 40 CFR 136.</p>				

## VII. Special Conditions

**Best Management Practices** – Discharge flow must not cause erosion to receiving streambeds or banks. If necessary, best management practices (BMPs) such as flow dissipation devices or rip rap must be installed to reduce/control erosion.

**Corrective Action** – Upon visual observation of an oil sheen or inadequate BMPs leading to erosion, the following steps must be conducted:

- Take a grab sample for analysis if there is an observation of oil and grease.
- Cease discharge until the issue is resolved.
- Conduct a site-wide inspection to observe operating conditions and BMP maintenance.
- Address any failures or inadequate BMPs
- Document the issues in writing to DEQ

## Information Sources

Administrative Rules of Montana Title 17 Chapter 30 – Water Quality

- Subchapter 2 – *Water Quality Permit and Application Fees*
- Subchapter 6 – *Montana Surface Water Quality Standards and Procedures*
- Subchapter 7 – *Nondegradation of Water Quality*
- Subchapter 12 – *Montana Pollutant Discharge Elimination (MPDES) Standards*
- Subchapter 13 – *Montana Pollutant Discharge Elimination (MPDES) Permits*

Vermont Department of Environmental Conservation. General Permit 3-9004 Discharges from Petroleum Related Remediation Activities. Agency of Natural Resources.

EPA. Fact Sheet for Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks. June 1989.

EPA. Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks. June 1989.

Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.

Montana Code Annotated (MCA), Title 75-5-101, *et seq.*, “Montana Water Quality Act.”

Montana DEQ. 2017. *Department Circular DEQ-7, Montana Numeric Water Quality Standards.*

Montana DEQ. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MTG790000 Administrative Record. October 2017.

US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.

Washington State Department of Ecology. Guidance for Remediation of Contaminated Sites. Pub. No. 10-09-057. (undated)

APPENDIX A

TABLE II - ORGANIC TOXIC POLLUTANTS IN EACH OF FOUR FRACTIONS IN ANALYSIS BY GAS CHROMATOGRAPHY/MASS SPECTROSCOPY (GS/MS)

<b><i>Volatiles</i></b>	2A 2,4-dichlorophenol	18B chrysene
1V acrolein	3A 2,4-dimethylphenol	19B dibenzo(a,h)anthracene
2V acrylonitrile	4A 4,6-dinitro-o-cresol	20B 1,2-dichlorobenzene
3V benzene	5A 2,4-dinitrophenol	21B 1,3-dichlorobenzene
5V bromoform	6A 2-nitrophenol	22B 1,4-dichlorobenzene
6V carbon tetrachloride	7A 4-nitrophenol	23B 3,3'-dichlorobenzidine
7V chlorobenzene	8A p-chloro-m-cresol	24B diethyl phthalate
8V chlorodibromomethane	9A pentachlorophenol	25B dimethyl phthalate
9V chloroethane	10A phenol	26B di-n-butyl phthalate
10V 2-chloroethylvinyl ether	11A 2,4,6-trichlorophenol	27B 2,4-dinitrotoluene
11V chloroform		28B 2,6-dinitrotoluene
12V dichlorobromomethane	<b><i>Base/Neutral</i></b>	29B di-n-octyl phthalate
14V 1,1-dichloroethane	1B acenaphthene	30B 1,2-diphenylhydrazine (as azobenzene)
15V 1,2-dichloroethane	2B acenaphthylene	31B fluroranthene
16V 1,1-dichloroethylene	3B anthracene	32B fluorene
17V 1,2-dichloropropane	4B benzidine	33B hexachlorobenzene
18V 1,3-dichloropropylene	5B benzo(a)anthracene	34B hexachlorobutadiene
19V ethylbenzene	6B benzo(a)pyrene	35B hexachlorocyclopentadiene
20V methyl bromide	7B 3,4-benzofluoranthene	36B hexachloroethane
21V methyl chloride	8B benzo(ghi)perylene	37B indeno(1,2,3-cd)pyrene
22V methylene chloride	9B benzo(k)fluoranthene	38B isophorone
23V 1,1,2,2-tetrachloroethane	10B bis(2-chloroethoxy)methane	39B naphthalene
24V tetrachloroethylene	11B bis(2-chloroethyl)ether	40B nitrobenzene
25V toluene	12B bis(2-chloroisopropyl)ether	41B N-nitrosodimethylamine
26V 1,2-trans-dichloroethylene	13B bis(2-ethylhexyl)phthalate	42B N-nitrosodi-n-propylamine
27V 1,1,1-trichloroethane	14B 4-bromophenyl phenyl ether	43B N-nitrosodiphenylamine
28V 1,1,2-trichloroethane	15B butylbenzyl phthalate	44B phenanthrene
29V trichloroethylene	16B 2-chloronaphthalene	45B pyrene
31V vinyl chloride	17B 4-chlorophenyl phenyl ether	46B 1,2,4-trichlorobenzene
<b><i>Acid Compounds</i></b>		
1A 2-chlorophenol		