FACT SHEET

The United States Environmental Protection Agency (EPA) proposes to reissue a National Pollutant Discharge Elimination System (NPDES) General Permit to discharge pollutants pursuant to the provisions of the Clean Water Act, 33 USC §1251 et seq. to:

Groundwater Remediation Discharge Facilities
Permit Number: IDG911000
(Formerly IDG910000)

Public Comment Period
Start Date: April 3, 2014
End Date: May 19, 2014

Technical Contact
Contact: Jill A. Nogi, MPH
Email: nogi.jill@epa.gov
Phone: (206) 553-1841, or call 1-800-424-4372 and request x-1841

EPA PROPOSES NPDES PERMIT REISSUANCE

The U.S. Environmental Protection Agency (EPA) proposes to reissue the NPDES General Permit to discharge pollutants from Groundwater Remediation Facilities to waters of the United States (U.S.) in Idaho. In order to ensure the protection of water quality and human health, the Groundwater General Permit (GWGP) establishes limits on the types and amounts of pollutants that can be discharged as well as other conditions on facilities authorized to discharge under the Permit.

This GWGP does not provide coverage for discharges from mining operations which are now covered by an administrative extension of the previous General Permit (NPDES Permit No. IDG910000; expired as of June 30, 2012). However, the EPA intends to issue a mining-specific general permit at a later date. Those mining facilities which have extended coverage under the previous permit must continue to operate in compliance with the limits and conditions of IDG910000 until a new permit is issued.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures;
- descriptions of the types of facilities and discharges covered under the General Permit;
- a listing of proposed effluent limitations and other conditions;
- a description of the specific facilities currently covered; and
- technical material supporting the conditions in the Permit

CLEAN WATER ACT 401 STATE CERTIFICATION

The EPA requested that the Idaho Department of Environmental Quality (IDEQ) certify this Draft Groundwater Remediation General Permit (GWGP) under provisions of Section 401 of the Clean Water Act (CWA), 33 USC § 1341. The State of Idaho has provided a draft certification for the Draft GWGP and it is attached as Appendix E. Questions on the draft IDEQ § 401 certification may be addressed to Miranda Adams, at (208) 373-0574 or at Miranda.Adams@deq.idaho.gov.

Comments regarding the draft certification should be directed to:

Miranda Adams
401/404 Water Quality Coordinator
Idaho Department of Environmental Quality
1410 N. Hilton Street
Boise, ID 83706

PUBLIC COMMENT

Persons wishing to comment on the Draft GWGP may do so in writing by the expiration date of the public notice. All comments must be in writing and must include the commenter's name, address, and telephone number, permit name, and permit number. Comments must include a concise statement of the basis and any relevant facts the commenter believes the EPA should consider in making its decision regarding the conditions and limitations in the final permit. All written comments and requests must be submitted to the attention of the EPA Regional Director, Office of Water and Watersheds at the following address: U.S. EPA, Region 10, 1200 6th Avenue, Suite 900, OWW-130, Seattle, WA 98101. Alternatively, comments may be submitted by facsimile to (206) 553-0165; or submitted via e-mail to Jill Nogi at the above email address by the expiration date of the public comment period.

Persons wishing to request that a public hearing be held may do so, in writing, by the expiration date of this public comment period. A public hearing is a formal meeting whereby EPA officials hear the public's views and concerns about an EPA action or proposal. A request for a public hearing must state the nature of the issues to be raised, reference the NPDES permit name and permit number, and include the requester's name, address, and telephone number.

After the comment period closes, and all significant comments have been considered, the EPA will review and address all submitted comments. EPA's Regional Director for the Office of Water and Watersheds will then make a final decision regarding permit issuance. If no comments are received, the tentative conditions in the Draft GWGP will become final. Pursuant to Section 509(b)(1) of the Clean Water Act [33 USC 1369(b)(1)], any interested person may appeal the permit in the Ninth Circuit Court of Appeals within 120 days following notice of EPA's final decision for the permit.

DOCUMENTS ARE AVAILABLE FOR REVIEW

The Draft GWGP, fact sheet, and related documents can be reviewed or obtained by visiting or contacting the EPA Region 10 Operations Office in Boise between 8:30 a.m. and 4:00 p.m. (Mountain Time), Monday through Friday:

United States Environmental Protection Agency Region 10
Idaho Operations Office
950 W. Bannock Street, Suite 900
Boise, ID 83702
(208) 378-5746

The Draft GWGP and fact sheet also are available for inspection and copying at the following federal and state offices:

U.S. Environmental Protection Agency Region 10
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101
(206) 553-0523 or 1-800-424-4372 and request x-0523

Idaho Department of Environmental Quality
State Office
1410 North Hilton Street
Boise, Idaho 83706
(208) 373-0502

Idaho Department of Environmental Quality
Boise Regional Office
1445 North Orchard Street
Boise, Idaho 83706-2239
(208) 373-0550

Idaho Department of Environmental Quality
Twin Falls Regional Office
650 Addison Avenue West, Suite 110
Twin Falls, ID 83301
(208) 736-2190

Idaho Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way, #300
Pocatello, Idaho 83201
(208) 236-6160

Idaho Department of Environmental Quality
Lewiston Regional Office
1118 F. Street
Lewiston, Idaho 83501
(208) 799-4370

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, Idaho 83814
(208) 769-1422

Idaho Department of Environmental Quality
Idaho Falls Regional Office
900 N. Skyline Drive
Idaho Falls, Idaho 83402
(208) 528-2650

The Draft GWGP, fact sheet, and other information also can be found by visiting the Region 10 website at www.epa.gov/r10earth/waterpermits.htm.

For technical questions regarding the permit or fact sheet, contact Jill Nogi at the phone number or e-mail listed above. Services can be made available to persons with disabilities by contacting Audrey Washington at (206) 553-0523.

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ACRONYMS

AML	Average Monthly limit
APA	Administrative Procedures Act
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BE	Biological Evaluation
BMPs	Best Management Practices
BO	Biological Opinion
BOD	Biological Oxygen Demand
BPJ	Best Professional Judgment
BPT	Best Practicable Control Technology Currently Available
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CAA	Clean Air Act
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	White House Council on Environmental Quality
CF	Conversion Factor
CFR	Code of Federal Regulations
COC	Contaminant of Concern
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
CZARA	Coastal Zone Act Reauthorization Amendments
DCA	Dichloroethane
DCB	Dichlorobenzene
DCE	Dichloroethylene
DEHP	Di (2-ethylhexyl) Phthalate
DF	Dilution Factor
DMR	Discharge Monitoring Report
DWS	Domestic Water Supply – use designation in Idaho Water Quality Standards
EA	Environmental Assessment
EDB	Ethylene Dibromide
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ELG	Effluent Limitation Guidelines
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
GPD	Gallons per Day
GPM	Gallons per Minute
GAC	Granular Activated Carbon
GC/ECD	Gas Chromatography/Electron Capture Detection
GWGP	Groundwater Remediation Facilities General Permit
HVO	Halogenated Volatile Organic
ICIS	Integrated Compliance Information System
IDA	Idaho Department of Agriculture
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDWR	Idaho Department of Water Resources

K_{ow}	Octanol Water Partition Coefficient
LA	Load Allocation
LUST	Leaking Underground Storage Tank
LTA	Long Term Average
MCL	Maximum Contaminant Level
MDL	Maximum Daily Limit or Method Detection Limit
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
ML	Minimum Level
MMP	Mercury Minimization Plan
MPRSA	Marine Protection Research and Sanctuaries Act
MSDS	Material Safety Data Sheet
MSGP	Stormwater Multi-Sector General Permit for Industrial Activities
MTBE	Methyl Tert-Butyl Ether
NEPA	National Environmental Policy Act
NOAA-NMFS	National Oceanic and Atmospheric Administration- National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPDWR	National Primary Drinking Water Regulations
NSPS	New Source Performance Standards
O&M	Operation and Maintenance (of a treatment facility)
OMB	White House Office of Management and Budget
OWW	EPA Office of Water and Watersheds
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
PCP	Pentachlorophenol
POTW	Publicly Owned Treatment Works
PSD	Prevention of Significant Deterioration
PVC	Polyvinyl Chloride
QAP	Quality Assurance Plan
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation Recovery Act
RFA	Regulatory Flexibility Act
RP	Reasonable Potential
RSL	EPA Region 9 Regional Screening Levels for Actions under CERCLA
SDWA	Safe Drinking Water Act
TAS	Treatment in a Manner Similar to a State (EPA-Tribal Government Process)
TBEL	Technology-Based Effluent Limitation
TCA	Trichloroethane
TCE	Trichloroethylene
TMDL	Total Maximum Daily Load
TPH	Total Petroleum Hydrocarbon
TR	Total Recoverable (Metal Concentration)
TSD	EPA Technical Support Document for Water Quality-based Toxics Control
TSS	Total Suspended Solids
UIC	Underground Injection Control

UMRA	Unfunded Mandates Reform Act
US	United States
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WET	Whole Effluent Toxicity
WLA	Wasteload Allocation
WQBEL	Water Quality-Based Effluent Limitation
WQS	Water Quality Standards

DEFINITIONS

7Q10 flow (seven-day, ten year low flow) means the lowest seven day consecutive mean daily stream flow with a recurrence interval of ten years.

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative [40 CFR 122.2].

Air stripping means the treatment process that increases evaporation and volatilization of volatile organic compounds (VOCs) from contaminated groundwater by increasing the surface area of the water exposed to air.

Average monthly limits means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. It may also be referred to as the "monthly average limits"[40 CFR 122.2].

Best Available Technology Economically Achievable (BAT) means the technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. BAT effluent limitations guidelines (ELGs), in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT) means the technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease.

Brownfield site means, with certain legal exclusions and additions, means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. [Section 101 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. § 9601)].

BTEX means the sum of benzene, toluene, ethylbenzene and total xylenes -volatile organic compounds typically found in petroleum products, such as gasoline and diesel fuel.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

CAS registration number means the number assigned by the Chemical Abstract Service (CAS) to uniquely identify a chemical.

Carbon adsorption means the treatment of water or air streams by forcing the fluid through a granular activated carbon (GAC) filter which removes organic contaminants from the fluid to remain behind inside the filter.

CFR means the Code of Federal Regulations, which is the official annual compilation of all regulations and rules promulgated during the previous year by the agencies of the United States government, combined with all the previously issued regulations and rules of those agencies that are still in effect.

Composite sample means a flow-proportioned mixture of not less than four discrete representative samples collected at the same discharge point within the same 24 hours.

Congener means a member of the same kind, class, or group of chemicals.

Conventional pollutant means biological oxygen demand (BOD), total suspended solids (TSS), bacteria, oil and grease, and pH as defined in 40 CFR 401.16.

Continuous Discharge means a discharge which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities [40 CFR 122.2].

CWA means the Clean Water Act in the United States Code (USC) (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483, and Public Law 97-117, 33 USC 1251 et seq. [40 CFR 122.2].

Daily discharge means the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limits expressed as mass "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day [40 CFR 122.2].

Designated Use means those beneficial uses assigned to identified waters in Idaho Department of Environmental Quality Rules in the Idaho Administrative Procedures Act (IDAPA), IDAPA 58.01.02, "Water Quality Standards," Sections 110 through 160, whether or not the uses are being attained [IDAPA 58.01.02.010.24].

The Director means the Regional Administrator of the EPA Region 10, or the Director of the EPA Region 10 Office of Water and Watersheds, the State of Idaho Department of Environmental Quality, or an authorized representative thereof.

Discharge when used without qualification means the "discharge of a pollutant."

Discharge Monitoring Report (DMR) means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by Permittees [40 CFR 122.2].

Discharge of a pollutant means:
Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any "indirect discharger" [40 CFR 122.2].

Draft permit means a document prepared under 40 CFR 124.6 indicating the Director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a "permit" [40 CFR 122.2].

Effluent limitation means any restriction imposed by the Director on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean [40 CFR 122.2].
Effluent limitations guidelines (ELG) means a regulation published by the Administrator under section 304(b) of CWA to adopt or revise "effluent limitations' [40 CFR 122.2].

Excluded Waters, or prohibited waters, means water bodies not authorized as receiving waters to be covered under this general NPDES permit.

Ex-situ Treatment means treatment of contaminated groundwater that has been pumped out of the aquifer and treated above the ground surface. The groundwater has been removed from its place in the underground aquifer.

Facility means any NPDES point source or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

General permit means an NPDES "permit" issued under Sec. 122.28 authorizing a category of discharges under the CWA within a geographical area [40 CFR 122.2].

Grab sample means a single water sample or measurement of water quality taken at a specific time.

Hazardous Material is defined in the IDAPA to mean a material or combination of materials which, when discharged in any quantity into state waters, presents a substantial present or potential hazard to human health, the public health, or the environment [IDAPA 58.01.02.010.46]. It is also defined at 40 CFR 122.2 to mean any substance designated in 40 CFR 116, pursuant to Section 311 of the CWA.

Henry's Law Constant means the coefficient that represents the equilibrium partitioning factor between water and vapor phases. The higher the constant, the more likely the substance is to volatilize.

Indian Country as indicated by 18 USC §1151 means: (a) All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation,
(b) All dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and,
(c) All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

Ion exchange treatment means the use of ion exchange (a reversible process in which an ion in solution in contact with a crystal replaces an ion in the lattice of that crystal) for water softening or other water-treatment processes.

Indian Tribe means any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation [40 CFR 122.2].

Influent means the water from upstream that enters the facility.

In-situ Treatment means groundwater treatment that occurs within the aquifer in contrast to pump and treat or similar systems where groundwater is removed from the aquifer and treated above the ground surface.

Maximum means the highest measured discharge or pollutant in a waste stream during the time period of interest.

Maximum Daily Discharge limitation means the highest allowable "daily discharge" [40 CFR 122.2].

Monthly Average Limit means the average of "daily discharges" over a monitoring month, calculated as the sum of all "daily discharges" measured during a monitoring month divided by the number of "daily discharges" measured during that month [40 CFR 122.2].

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA [40 CFR 122.2].

Nonconventional Pollutants means all pollutants that are not included in the list of conventional or toxic pollutants in 40 CFR 401. This includes pollutants such as chlorine, ammonia, COD, nitrogen, and phosphorous.

Notice of Intent (NOI) means a request, or application, to be authorized to discharge under a general NPDES permit.

Nuisance means anything which is injurious to the public health or an obstruction to the free use, in the customary manner, of any waters of the State [IDAPA 58.01.02.010.67].

Octanol-Water Partition Coefficient (K_{ow}) means the empirical parameter that represents the equilibrium of an organic compound, which represents a generic organic phase, and the aqueous phase.

Outstanding resource water means a high quality water, such as water of national and state parks and wildlife refuges and water of exceptional recreational significance, which has been designated by the legislature and subsequently listed in this chapter (of IDAPA 58.01.02). ORW designation constitutes an outstanding national or state resource that requires protection from point and nonpoint source activities that may lower water quality [IDAPA 58.01.02.010.72].

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials [except those regulated under the Atomic Energy Act of 1954, as amended (42 USC 2011 et seq.)], heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water [40 CFR 122.2].

Services means the United States Fish and Wildlife Service and/or the National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA Fisheries or NMFS)

Sorption means adhesion or release of molecules or ions on a particle surface including all processes associated with adsorption or absorption.

Technology-based effluent limitation (TBEL) means treatment requirements under Section 301(b) of the Clean Water Act that represent the minimum level of control that must be imposed in a permit issued under section 402 of the Clean Water Act. EPA is required to promulgate technology-based limitations and standards that reflect pollutant reductions that can be achieved by categories, or subcategories of industrial point sources using specific technologies that EPA identifies as meeting the statutorily prescribed level of control under the authority of CWA sections 301, 304, 306, 307, 308, 402, and 501 [33 USC § 1311, 1314,1316,1318,1342, and 1361].

Total Maximum Daily Load (TMDL) means the sum of the individual wasteload allocations (WLAs) for point sources, load allocations (LAs) for non-point sources, and natural background when allocating pollutant loading to a particular waterbody. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality [IDAPA 58.012.02.010.100].

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [40 CFR 122.41(n)].

Vapor Pressure means the measure of the tendency of a substance to pass from the solid or liquid phase to a vapor state at a given pressure. It can also mean the partial pressure of a vapor.

Waters of the United States or waters of the U.S. means:
(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(b) All interstate waters, including interstate "wetlands;"
(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
    (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;
    (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
(d) All impoundments of waters otherwise defined as waters of the United States under this definition;
(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;
(f) The territorial sea; and
(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition [40 CFR 122.2].

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test [40 CFR 122.2]

I. Introduction

A. General Permits

Section 301(a) of the Clean Water Act (CWA), 33 USC § 1311(a), provides that the discharge of pollutants to waters of the U.S. is unlawful except in accordance with terms and conditions of an NPDES permit. The EPA's implementing regulations found under Title 40 of the Code of Federal Regulations (CFR), Part 122, Section 28, authorize the issuance of general permits to categories of discharges [40 CFR 122.28].

In accordance with 40 CFR 122.28, the Director is authorized to issue a general permit to numerous facilities when the facilities:

- Are located within the same geographic area;
- Involve the same or substantially similar types of operations;
- Discharge the same types of waste;
- Require the same effluent limits or operating conditions;
- Require the same or similar treatment technologies or monitoring requirements, and
- In the opinion of the EPA, are more appropriately controlled under a general permit rather than an individual permit.

The EPA is issuing this Draft GWGP for groundwater remediation facilities discharging to waters of the U.S. in Idaho pursuant to EPA's authority under CWA Section 402. The Draft GWGP meets the criteria for general permits as follows:

Geographic area

All of the discharges authorized by the GWGP will be into waters of the U.S. within the State of Idaho, unless otherwise restricted. See Permit Part I.E.

Involves the Same or Substantially Similar Types of Operations

A facility performing the extraction of contaminated groundwater from the subsurface and treating in an above ground (*ex-situ*) system is usually described as a "pump-and-treat" operation. This Draft GWGP covers two broad types of groundwater remediation facilities: A) petroleum related cleanups; and, B) non-petroleum related cleanups.

Discharge the Same Types of Waste

The majority of the discharges to be covered under this GWGP will contain one or more pollutants from common chemical groups, such as suspended solids, total petroleum hydrocarbons (TPH), other volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), semi-volatile compounds, and metals. Petroleum related cleanup sites include those contaminated primarily with fuel oils such as gasoline, diesel, aviation fuel, kerosene and heating oil. Also included in the petroleum-related category are lubricating and hydraulic oils, used oil, and petroleum based or stoddard solvents. Nonpetroleum related cleanup sites typically include facilities where groundwater is contaminated with VOCs, wood preservatives, metals, and other contaminants such as polychlorinated biphenyls (PCBs).

Same Effluent limits or Operating Conditions

The Draft GWGP proposes the same effluent limits, monitoring requirements and other operating conditions for all groundwater remediation dischargers who have self-identified in the same sub-category. An individual facility covered under the GWGP could have effluent limits based on a mixing

zone allowance, where applicable. In this case, the EPA will provide for public notice and comments before finalizing the effluent limits for that facility.

Same or Similar Treatment Technologies or Monitoring Requirements
Although the Draft GWGP does not propose the use of specific treatment technologies, there is a short list of treatment options typically employed at most groundwater remediation sites, including: phase separation, sedimentation, filtration, air stripping, and/or carbon adsorption. Vapor phase carbon treatment also is typically utilized with air stripping for air emission control. For metal(s) removal, typical controls include chemical addition, pH adjustment, and in some cases, ion exchange units.

The discharge of treated groundwater to surface water typically occurs in proximity to the source of groundwater contamination, depending on the size of the contaminated groundwater plume and the distance between the treatment facility and the receiving water body. As mentioned previously, the Draft GWGP proposes the same monitoring requirements for all dischargers who have self-identified in the same category.

Appropriateness
Because of these factors discussed above, the EPA has determined that the majority of the groundwater remediation facilities in Idaho are more appropriately controlled under a general permit than under individual NPDES permits. The similarity of the operations, and the technologies used to treat similar chemicals at groundwater remediation facilities resulting in the discharge of similar waste types has prompted the EPA to reissue this GWGP.

B. Permit History
The previous Permit, referred to hereinafter as the 2007 GWGP, (NPDES Permit No. IDG910000) was effective on July 1, 2007 and expired on June 30, 2012. Six (6) facilities currently have an EPA administrative extension of coverage under the expired 2007 GWGP. The reissuance of this General Permit will replace the 2007 GWGP for four (4) facilities and the new permit number will be IDG911000.

The Draft GWGP does not propose coverage for discharges from two (2) mining facilities which were previously covered under the 2007 GWGP. The EPA has determined that those facilities will be more appropriately covered under a mining-specific general permit and EPA intends to issue that general permit at a later date. The existing mining operations with an EPA administrative extension of coverage under the 2007 GWGP may continue to operate under the limitations and conditions of the 2007 GWGP until such time as a new permit and a new authorization to discharge are issued. These 2 facilities include the 900 Level Adit, owned/operated by the Atlanta Gold Corporation of America, and the DeLamar Mine owned/operated by the Kinross DeLamar Mining Company.

II. Background Information

A. Types of Groundwater Remediation Facilities and Associated Pollutants
The Draft GWGP is written to cover *ex-situ* groundwater treatment facilities such as pump and treat operations, or seepage water collection systems in which treated groundwater is discharged to waters of the U.S. in Idaho. This also includes construction/excavation dewatering and aquifer pump testing occurring at a contaminated site, such as EPA designated Brownfield sites.
Although contaminated groundwater sites have been known to contain thousands of different chemical pollutants, both petroleum and non-petroleum related cleanup sites can usually be associated with "typical" chemicals of concern (COCs) that are characteristic of organic and inorganic water pollutants

(i.e., fuels, VOCs, metals, etc.). Therefore, the COCs that are proposed to be regulated by this Draft GWGP include many petroleum related organic compounds, VOCs, and naturally occurring inorganic compounds.

For the purposes of the GWGP, groundwater remediation facilities fall into one of six (6) categories. See the table below.

Table 1. GWGP Categories, Sources, and Types of Pollutants Expected

Category	Category Title	Sources	Pollutants Expected
A-1	Gasoline Only Sites	Short Term dewatering from underground storage tank (UST) removal or replacement, long term groundwater pump and treat systems, groundwater seepage collection systems, construction dewatering, aquifer pump testing, releases of leaded gasoline, and other activities where gasoline is a known contaminant	Benzene, toluene, ethylbenzene, & xylenes (BTEX), napththalene, ethylene dibromide (EDB), methyl tert-butyl ether (MTBE), total petroleum hydrocarbons (TPH), lead, iron
A-2	Fuel Oils (and Other Oils) Only Sites	Releases of diesel, kerosene, jet fuels, heating oil and heavier residual fuel oils. Includes releases of lube oils, machine oils, hydraulic fluids, mineral oils, and other oil products excluding waste oil. Short term dewatering from UST work, pump and treat systems, and other activities where oil is a known contaminant	Naphthalene, polycyclic aromatic hydrocarbons (PAHs), benzene, BTEX, nickel, chromium, zinc, iron, TPH
A-3	Petroleum Mixed with Other Contaminants Sites	Site where petroleum releases have been identified as the primary source; however, other contaminants from mixed wastes were released, including waste solvents, heavy metals from industrial processes, or waste oils commingled with other contaminants, including PCBs and PAHs	Petroleum related compounds with associated VOCs, PAHs, and metals
B-1	VOC Only Sites	Releases of chlorinated VOCs, typically related to improper disposal or spills of solvents, de-greasers, cleaners, paint removers, or from industrial operations, chemical blending, transportation or other sources of releases	VOCs, metals
B-2	VOC Sites with Other Contaminants	Releases where site characterization identified chlorinated VOC compounds as primary contaminant but other contaminants are present – VOC sites may have varying amounts of TPH, metals or other pollutants	VOCs, metals, PAHs, PCBs, petroleum related contaminants
B-3	Sites Containing Primarily Metals	Releases of heavy metals were the primary source of groundwater contamination;	Metals with organic contaminants

B. Summary of Major Changes from Previous Permit

EPA proposes several changes in this Draft GWGP. These changes are summarized below and further discussed in the referenced Permit and fact sheet sections.

Table 2. Summary of Major Changes Proposed in General Permit IDG911000

Permit Section	Fact Sheet Section	Draft GWGP Permit Conditions Include
II.B Facilities Ineligible for Coverage	III.B Facilities Excluded from Coverage	The exclusion of mining operations from eligibility.
II.I Notice of Intent Submittal Deadlines	IV.A. Time Frame for Submitting an NOI	A provision that existing dischargers not excluded from coverage, as well as Boise State University (BSU) which provided materials for an individual permit and supplemental NOI information to EPA, will be granted coverage on the effective date of the final GWGP. New dischargers must submit NOI information to EPA and IDEQ 180 days prior to the commencement of a discharge.
III.A Effluent Limitations	V.B. Water Quality-based Effluent Limitations	Revised effluent limitations based on: • Idaho's newer (2006) WQS. (The 2007 GWGP used Idaho's 2005 WQS.) EPA calculated different limits for receiving waters designated as a Domestic Water Supply (DWS) in accordance with the WQS. • Minimum hardness values for hardness-dependent metals of 25 mg/L and 10 mg/L for cadmium. • Requiring both average monthly and maximum daily effluent limits for continuous dischargers.
IV.B Best Management Practices (BMP) Plan	VII.B Best Management Practices (BMP) Plan	A provision requiring a BMP Plan, which is standard for industrial facilities. The last GWGP required an Operation & Maintenance (O&M) Plan. Those requirements have now been incorporated into the BMP Plan provision.
V.B Monitoring Requirements	VI. Monitoring and Reporting Requirements	Requirements for more frequent monitoring and an expanded list of COCs to monitor (i.e., the entire list of limited COCs for a groundwater remediation facility category.)
V.D Reporting of Monitoring Results	VI.D Submission of Discharge Monitoring Reports	A requirement for the use of NetDMR, which enables the electronic submission of monitoring data to EPA and IDEQ.

III. Applicability and Coverage

A. Facilities Eligible for Coverage

See Sections I.A and II.A, above.

B. Facilities Excluded from Coverage

1. On-Scene Coordinator Emergency Response Action. In accordance with federal regulations at 40 CFR 122.3(d), if a groundwater remediation discharge occurs in compliance with the instructions of an On-Scene Coordinator pursuant to the National Oil and Hazardous Substances Pollution Contingency Plan, then the discharge is excluded from NPDES requirements [40 CFR 300, 33 CFR 153.10(e)].

2. Federal Superfund Cleanup Actions. Facilities discharging treated groundwater as part of an on-site response action conducted pursuant to Sections 104, 106, 120, 121 or 122 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) are not required to obtain NPDES permit coverage under the CWA. The term on-site means the aerial extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action.

3. Mining Operations. This exclusion is a change from the 2007 GWGP. EPA proposes this change because of the unique activities associated with mining and the types of pollutants present in waste streams from such activities. Those existing mining operations with an EPA administrative extension of coverage under the 2007 GWGP may continue to operate under the limitations and conditions of the 2007 GWGP until such time as a new permit is issued to those facilities. If these facilities wish to terminate permit coverage, a request for termination must be submitted to EPA in accordance with 40 CFR 122.64. See Section IV.E of this fact sheet.

4. Pretreatment Facilities. Facilities discharging treated groundwater to a sanitary sewer under an authorized NPDES pretreatment program, or those facilities with the explicit written permission of the Public Works Director or similar authority to discharge to a publicly owned treatment works (POTW) are excluded from the GWGP. [40 CFR 122.3(c)]

5. UIC Permitted Facilities. Facilities injecting treated groundwater back into the subsurface will require a separate Underground Injection Control (UIC) Program permit under authority of the Safe Drinking Water Act (SDWA) issued by the Idaho Department of Water Resources (IDWR) and are excluded from the GWGP.

6. In-situ Treatment Facilities. In-situ groundwater treatment systems that do not discharge to surface water are excluded from the GWGP.

7. Facilities Authorized under another Appropriate NPDES Permit. Discharges of groundwater from remediation sites which are otherwise eligible but are authorized to discharge groundwater under a different NPDES permit are not covered by this permit. EPA clarifies that certain types of groundwater discharges, such as excavation dewatering, seeps, springs, etc., are more appropriately authorized through other NPDES permits. Such available NPDES permits may include the NPDES General Permit for Construction Activities in Idaho (Permit IDR120000) and/or the Multi-Sector General Permit for Stormwater Associated with Industrial Activities in Idaho (Permit IDR050000). Alternatively, discharges of uncontaminated groundwater into surface water through a municipal separate storm sewer system (MS4) may also be allowed in compliance with any applicable requirements imposed by an NPDES-regulated municipal entity.

C. Facilities Requiring an Individual NPDES Permit

In accordance with 40 CFR 122.28(b)(3)(i), the EPA may determine that providing coverage under a general permit is inappropriate for particular facilities and may require such facilities to apply for an individual NPDES permit.

In accordance with federal regulations at 40 CFR 122.28(b)(3)(iii), if a facility is eligible for coverage under an NPDES general permit and then decides that an individual permit is desired, the facility may request to be excluded from the coverage under the general permit by applying for an individual NPDES permit.

The owner or operator must submit the appropriate NPDES permit application forms to EPA Region 10, with the justification supporting a request for an individual NPDES permit, no later than 180 days prior to the anticipated date of commencing to discharge. The request for an individual NPDES permit will be reviewed and processed in accordance with federal regulations at 40 CFR Part 124, once the application is deemed timely and complete. The request will be granted by the issuance of an individual NPDES permit if the reasons cited by the owner or operator clearly demonstrate that inclusion under the general permit is inappropriate.

The Director may also require any person authorized by a general permit to apply for and obtain an individual permit. In accordance with federal regulations at 40 CFR 122.28(b)(3)(iv), the applicability of the general permit is automatically terminated on the effective date of the individual permit.

D. Pollutants Authorized by this General Permit

The GWGP will authorize discharges of specified COCs in limited amounts to the waters of the U.S. within the State of Idaho. Appendix B of this fact sheet, Pollutant Specific Analysis of Effluent Limitations and Rationales, contains a detailed discussion of the COCs limited by the GWGP.

E. Pollutants Not Authorized by this General Permit

This GWGP does not authorize the discharge of any waste streams, including spills and other unintentional or non-routine discharges of pollutants, that are not part of the normal operation of the facility as disclosed in the permit application and/or NOI. In instances where discharges include chemicals other than the COCs covered by the GWGP or where applicants encounter particularly difficult pollutant control situations, the owner/operator may need to submit an application for an individual NPDES permit. See Section III.C, "Facilities Requiring an Individual NPDES Permit".

F. Receiving Waters Covered by this Permit

No change from the 2007 GWGP is proposed. In order for a facility to discharge to receiving waters excluded from Permit coverage, a waiver in the form of an individual CWA § 401 certification must be obtained from IDEQ or a tribe with EPA-approved "treatment in a manner similar to a state" (TAS), or in the form of concurrence from the Services on an Endangered Species Act (ESA) consultation, prior to receiving a letter from EPA authorizing a discharge under this GWGP (see Sections III.G and III.H below)

The effluent limitations for some pollutants proposed in the GWGP are, in part, dependent on the designated uses of the receiving water as identified in the State of Idaho WQS. Per IDAPA 58.01.02.101.01, all undesignated waters are to be protected for the beneficial uses of aquatic life protection and all recreation in and on the water. It is the Permittee's responsibility to identify the receiving water, into which water body of the Panhandle, Clearwater, Salmon, Southwest, Upper Snake, or Bear River basins that the discharge will be received, and the designated beneficial uses of the receiving water(s) (found at IDAPA 58.01.02.110-160). This information about the receiving water must be provided on the NOI for coverage under the GWGP.

G. Receiving Waters Excluded from Permit Coverage

Although EPA believes that this GWGP meets IDEQ water quality criteria for protection of aquatic life and human health uses, there are certain protected, special, or at-risk water resources within the State of Idaho which are excluded from GWGP coverage. Therefore, the GWGP does not authorize discharges to the following protected, special, or at-risk receiving waters, based on Idaho's anti-degradation policy, unless a waiver is granted to a facility by IDEQ prior to the facility seeking coverage under the GWGP.

1. Receiving waters not supporting their designated uses as identified within IDEQ's most recent EPA-approved Integrated Report, Sections 4(a), 4(b), and 5: Impaired Waters: Lakes and Rivers where the discharge to that receiving water contains the pollutant(s) for which the waterbody is impaired and contributes to the impairments, are excluded from the GWGP.
2. Waters designated as Tier 2 "high-quality" waters in the State of Idaho Water Quality Standards (WQS) antidegradation policy [IDAPA 58.01.02.051.02; 58.01.02.052.08] are excluded from the GWGP.

3. "Outstanding Resource Waters" identified in the WQS [IDAPA 58.01.02]. Idaho provides for designation of waters or river segments by the Idaho legislature after nomination of waters by the public and review of those nominations by the Idaho Board of Health and Welfare [IDAPA 58.01.02.052.09]. The Board gives special consideration to stream segments "generally recognized as constituting an outstanding national resource..., or of exceptional recreational or ecological significance." Outstanding resource water (i.e., Tier 3) designations constitute outstanding national or state resources that require protection from point and nonpoint source activities that may lower water quality [IDAPA 58.01.02.051].

4. Receiving waters one hundred (100) yards or less upstream of, or within a reservation or Indian Country, managed by the Coeur d'Alene Tribe, the Nez Perce Tribe, the Shoshone-Bannock Tribe, Shoshone-Paiute Tribe, or the Kootenai Tribe. The EPA believes that the waiver process outlined in Section III.H., below, provides for the appropriate intergovernmental consultations between EPA and the affected tribe concerning the permitting of any groundwater remediation facility discharging to these receiving waters. Tribal consultations between the EPA and a tribal government are for the purpose of addressing tribal concerns for water quality and environmental protection.

5. Receiving waters which flow into other states or Canada one hundred (100) yards or less upstream from the relevant state or international boundary.

6. Receiving waters designated under the Wild and Scenic Rivers Act.

7. Receiving waters where federally listed threatened, endangered, or candidate species, or designated or proposed critical habitat, pursuant to the Endangered Species Act (ESA) are present, or to any receiving waters determined to be essential fish habitat (EFH) under the Magnuson-Stevens Fishery Management and Conservation Act. The United States Fish and Wildlife Service (USFWS) ESA listings for the State of Idaho may be found at http://www.fws.gov/endangered and selecting for Idaho and/or a specific county of interest. The National Oceanic and Atmospheric Administration (NOAA) publishes an EFH Mapper tool found at http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html

8. Receiving waters within one-half (½) mile upstream of a permanent drinking water intake for a municipality.

H. Waiver to Discharge to Receiving Waters Excluded from Permit Coverage

No change to the previous permit is proposed. An owner or operator of a groundwater remediation discharge facility may request a waiver to discharge under the GWGP to the excluded areas listed in the Draft Permit Part I.E, "Receiving Waters Excluded from Permit Coverage." In order to obtain a waiver to discharge to one or more of these excluded areas, applicants must submit a timely and complete request for a waiver with their required NOI information. In order to obtain a waiver to discharge to receiving waters excluded from permit coverage, IDEQ must certify that the discharge meets state WQS through an individual CWA § 401 certification. The EPA will attach the IDEQ approved waiver request to the facility's authorization to discharge letter.

Discharges to Outstanding Resource Waters, Tier 2 "high-quality" waters, or to impaired waters, as identified on the most recent EPA-approved IDEQ Integrated Report, where the discharge contains the pollutant for which the waterbody is impaired, will only be allowed if IDEQ provides a written waiver in the form of an individual § 401 certification that will be attached to the EPA's authorization to discharge letter.

Discharges to waters within a reservation boundary, or within 100 yards or less upstream from a reservation boundary, will only be allowed after consultation between the EPA and the affected Indian tribe, and if the tribe provides a waiver.

In order to obtain a waiver to discharge to receiving waters excluded from permit coverage due to the presence of threatened, endangered or candidate species pursuant to ESA, or to any receiving waters determined to be EFH, the applicant must submit complete and timely information demonstrating "no degradation or adverse effects" of the physical, chemical, or biological integrity of the receiving water due to the discharge. This will typically take the form of a Biological Evaluation (BE) concluding a *no effect* or a *not likely to adversely affect* ESA species and a *no adverse effect* EFH determination. The prepared BE, including information relevant to ESA and EFH, must be submitted to the EPA and IDEQ along with the required NOI information to seek coverage. If the submitted BE concludes a *not likely to adversely affect* determination, EPA will consult, pursuant to Section 7 of the ESA, with the USFWS and the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA-NMFS) (the Services) to obtain their concurrence with the submitted effects determination for ESA/EFH. A waiver to discharge to an excluded receiving water will be provided to the facility as part of the EPA authorization to discharge letter, at the conclusion of the ESA consultation/EFH determination and concurrence processes.

If, during the course of the consultation process it is determined that the discharge *may adversely affect* any listed threatened, endangered, or candidate species; and/or *may adversely affect* or "extensive conservation requirements are necessary to protect" EFH, the facility may need to apply for an individual permit (Part I.C of the GWGP).

I. Continuation of Permit Coverage

In accordance with 40 CFR 122.46(a), NPDES permits shall be effective for a fixed term not to exceed five (5) years. Therefore, this GWGP will expire five years from the effective date of the final permit. If the GWGP is not reissued prior to the expiration date, it may be eligible for an administrative extension of coverage in accordance with the Administrative Procedures Act (APA) and will remain in full force. However, the EPA cannot provide written notification of administrative extension of coverage under this general permit to any Permittee who submits the NOI for administrative continuance of coverage to the EPA after the permit expiration date.

Therefore, any Permittee granted coverage under the GWGP prior to the expiration date that submits an NOI for administrative continuance of coverage within the proper time frame, and receives notice from the EPA that the NOI is deemed timely and complete, will remain covered by this GWGP until the earlier of:

- Authorization for coverage under reissuance or replacement of this GP following timely and appropriate submittal of a complete NOI requesting authorization to discharge under the new permit and compliance with requirements of the new permit;
- The Permittee's submittal of a Notice of Termination;
- The issuance of an individual NPDES permit; or,
- A formal permit decision by the Director not to reissue this General Permit, at which time the Permittee must seek coverage under an alternative general or individual permit (Part VI.D of the GWGP, "Duty to Reapply").

IV. Notification Requirements

New dischargers seeking coverage under this GWGP must submit to EPA a written NOI to be covered. In accordance with 40 CFR 122.28(b)(2)(i), a discharger who fails to submit a timely and complete NOI in accordance with the terms of a general permit is not authorized to discharge. A complete and timely NOI fulfills the requirements of a permit application for purposes of 40 CFR 122.6 and 122.21.

When a groundwater remediation facility is owned by one person or company, and is operated by another person or company, it is the operator's responsibility to apply for and obtain permit coverage [40 CFR 122.21(b)]. For owners/operators of multiple groundwater remediation facilities, a separate NOI must be completed for each site or remediation facility.

A. Time Frame for Submitting an NOI

Pursuant to 40 CFR 122.28(b)(2)(vi), EPA intends to cover some facilities under the GWGP without requiring an additional NOI for coverage. Three (3) Permittees, currently operating under an administrative extension of the 2007 GWGP, submitted NOIs in 2011-2012 along with updated requested information during development of the Draft GWGP in 2013. Those Permittees are

Univar USA. Inc.;
PacifiCorp Idaho Falls Pole Yard; and,
McCall Oil and Chemical Company.

In addition, one (1) facility submitted an application for an individual permit: Boise State University.

These discharge facilities are not required to resubmit an NOI to obtain coverage under the GWGP. However, any facility mentioned above that wishes to continue discharging beyond the new GWGP's expiration date must submit an NOI for continued coverage prior to Permit expiration to obtain an administrative extension (see Section III.I of this fact sheet and the Draft GWGP Part VI.D).

Any new discharger seeking coverage under the GWGP must submit an NOI to the EPA, the IDEQ State Office and the applicable Regional Office, and/or any affected Indian Tribe within 180 days before commencement of the discharge but prior to the expiration date of the new GWGP. Depending on the information provided, additional time may be necessary for EPA to authorize a discharge.

B. Information Required for the NOI

The NOI may consist of either a letter, report, or a table developed for the purpose of the NOI, along with necessary attachments, which addresses all of the requirements identified in this section. A standardized table can be accessed once the final permit is issued, found at http://XXXXX.

The NOI must include certain information in order to receive EPA authorization to discharge under this GWGP. The NOI requirements are found in Part I.J of the Draft GWGP. Continuous, as well as non-continuous, dischargers seeking permit coverage must submit the required NOI information to the EPA.

C. Submitting the NOI and Supporting Information to EPA and Relevant Offices

The NOI must be sent to the following locations as well as to the appropriate IDEQ Regional Office or tribal government office address. See Appendix D for the latest addresses:

U.S. Environmental Protection Agency, Region 10
Office of Water and Watersheds, NPDES Permits Unit

1200 Sixth Avenue, OWW-130
Suite 900
Seattle, Washington 98101

Idaho Department of Environmental Quality, State Office
1410 North Hilton Street
Boise, Idaho 83706

D. Authorization to Discharge

New applicants will be authorized to discharge as of the date of the written notification that the EPA has granted coverage under the new GWGP. The state certification, waivers to discharge to excluded waters, and/or mixing zone authorizations, will be attached to EPA's written authorization, as necessary.

As discussed above, the EPA intends to cover some facilities without requiring another NOI for coverage under this GWGP. The following facilities are authorized to discharge, upon receipt of written notification that the EPA has granted coverage under this GWGP, 30 days after the final GWGP publication in the Federal Register:

Univar USA. Inc – Boise Towne Square Mall, Westpark, and Five Mile Road locations
PacifiCorp Idaho Falls Pole Yard
McCall Oil and Chemical Company
Boise State University

Appendix C of this fact sheet provides information on these facilities. Until these facilities receive written authorization from EPA to discharge under the new GWGP, the 2007 GWGP remains in full force under the EPA administrative extension of Permit coverage.

E. Notice of Termination of Discharge

In accordance with 40 CFR 122.64, EPA may terminate coverage or deny a renewal of coverage under the GWGP, for the following reasons:

- Noncompliance by the Permittee with any condition of the permit;
- The Permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the Permittee's misrepresentation of any relevant facts at any time;
- A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination; or
- A change in any condition that requires either a temporary or permanent reduction or elimination of any discharge or sludge use or disposal practice controlled by the permit (for example, plant closure or termination of discharge by connection to a POTW).

The Permittee may also request termination of coverage under the GWGP in accordance with 40 CFR 122.64 and 122.22(d). The request must include a certification that the Permittee is not subject to any pending State or Federal enforcement actions including citizen suits brought under State or Federal law. The notification must be in writing and signed in accordance with the signatory requirements identified in 40 CFR 122.22. The notification must include the date that the discharger ceased operation, and the permit number assigned by the EPA. In cases of temporary shutdowns, a facility should not submit a notice of discharge termination, as this action results in the termination of NPDES coverage.

Termination of permit coverage under the GWGP will become effective 30 days after the Permittee receives written notification from EPA.

V. Rationale for Effluent Limitations and Standards

A. Statutory Requirements for Determining Effluent Limitations

Section 301(a) of the CWA, 33 USC § 1311(a), prohibits the discharge of pollutants to waters of the U.S. unless the discharge is authorized pursuant to an NPDES permit. Section 402 of the CWA, 33 USC § 1342, authorizes the EPA, or an approved state NPDES program, to issue an NPDES permit authorizing discharges subject to limitations and requirements imposed pursuant to CWA Sections 301, 304, 306, 401 and 403, 33 USC §§ 1311, 1314, 1316, 1341 and 1343.

In general, the CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. WQBELs are designed to ensure that the state adopted, EPA approved, WQS of a waterbody are being met and they may be more stringent than TBELs.

EPA first determines which TBELs apply to a discharge in accordance with applicable national effluent limitation guidelines (ELGs) and standards. EPA further determines which WQBELs apply to a discharge based upon an assessment of the pollutants discharged and a review of state WQS. Monitoring requirements must also be included in the permit to determine compliance with effluent limitations. Effluent and ambient monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality.

Technology-based Effluent Limitations

Section 301(b) of the CWA, 33 USC § 1311(b), requires technology-based controls on effluents. All NPDES permits must contain effluent limitations which: (a) control toxic pollutants and nonconventional pollutants through the use of "best available technology economically achievable" (BAT), and (b) control conventional pollutants through the use of "best conventional pollutant control technology" (BCT). In no case may BAT or BCT be less stringent than the "best practical control technology currently achievable" (BPT), which is the minimum level of control required by Section 301(b)(1)(A) of the CWA, 33 USC § 1311(b)(1)(A).

The intent of a technology-based effluent limitation (TBEL) is to require a minimum level of treatment for industrial point sources based on currently available treatment technologies while allowing a discharger to choose and use any available control technique to meet the limitations. Accordingly, every individual member of a discharge class or category is required to operate their water pollution control technologies according to industry-wide standards and accepted engineering practices.

TBELs are based on best professional judgment (BPJ) when national EPA effluent limitation guidelines (ELGs) have not been issued [40 CFR 125.3(a)(v)(B)]. ELGs have not yet been developed by the EPA for groundwater remediation dischargers or substantially similar activities. During the development of this Draft GWGP, EPA conducted a review to determine whether the TBELs from the 2007 GWGP were still appropriate. Based on the EPA's review, and as provided in Section 402(a)(1) of the CWA, the EPA proposes to retain, or adjust as necessary due to a change in basis, the TBELs from the 2007 GWGP. The EPA reviewed the following:

- Existing state groundwater remediation permits and factsheets;

- Available treatment technologies;
- Existing Discharge Monitoring Reports (DMRs) submitted by the facilities currently covered by 2007 GWGP IDG910000;
- EPA's National Primary Drinking Water Regulations - Maximum Contaminant Levels (MCLs)
- Idaho Risk Evaluation Manual (July 2004)
- Idaho Risk Evaluation Manual for Petroleum Releases (August 2012)
- Idaho Ground Water Quality Rule (IDAPA 58.01.11)
- Idaho Standards and Procedures for Application of Risk Based Corrective Action at Petroleum Release Sites (IDAPA 58.01.24)
- Model NPDES Permit Discharges Resulting from the Cleanup of Gasoline Released From Underground Storage Tanks (June 1989)
- ELG's from the Metal Finishing Point Source Category (40 CFR 433) and Landfill Category (40 CFR 445)
- ELGs from the Oil Treatment and Recovery Category (40 CFR 437) and the Organic Chemicals, Plastics and Synthetic Fibers Category (40 CFR 414)
- EPA Region 9 Regional Screening Levels for tap water at Superfund Sites http://www.epa.gov/region9/superfund/prg/index.html
- Water Pollution Control Federation's Chlorination of Wastewater (1976)

The 2007 GWGP incorporated both MCLs and risk-based groundwater cleanup levels in setting TBELs based upon BPJ. The 2007 GWGP also incorporated Idaho's Ground Water Quality Rule (IDAPA 58.01.11) which establishes ambient groundwater quality standards, and provides numeric criteria for groundwater quality based upon the protection of human health. In other circumstances, such as where contamination from metals is of concern, ELGs such as the Metal Finishing Point Source Category (40 CFR 433) were considered as a potential basis for a TBEL. In addition, EPA's guidance document, *Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks* (June 1989), provides a suggested limit for total BTEX.

Nearly all of the discharges pursuant to remediation projects in Idaho have utilized economically viable, common treatment systems including: 1) phase separation; 2) sedimentation; 3) filtration; 4) air stripping; and/or, 5) carbon adsorption. Vapor phase carbon or air stripping treatments are typically utilized for air emission control. For metals removal, typical controls include chemical addition, pH adjustment, filtration, and possibly ion exchange.

Some common groundwater pollutants are more difficult to treat due to their physical characteristics (including solubility, Henry's law constant, etc.). One example is MTBE, the most common fuel oxygenate in gasoline. To remove MTBE and other complex COCs from groundwater, additional operation and maintenance (O&M) costs may be required. However, the data submitted to EPA from dischargers using common treatment systems indicates that very low effluent concentrations are routinely achieved. The most common compounds in petroleum releases, such as BTEX; and chlorinated VOC solvents such as trichloroethylene (TCE) and tetrachloroethylene (also known as perchloroethylene - PCE) can typically be treated to below laboratory detection levels by commonly used technologies.

This Draft GWGP establishes average monthly and maximum daily TBELs, and the Permittee must ensure the application of best management practices (BMPs) to minimize the environmental impacts of the discharge. However, EPA does not prescribe specific technologies required to meet the effluent requirements. The information provided above is meant to demonstrate that, in most instances, the

contaminants found in these discharges can be successfully and economically managed. In instances where discharges include chemicals other than the COCs limited by the GWGP, or where applicants encounter particularly difficult pollutant control situations, the owner/operator may need to submit an application for an individual NPDES permit.

Table 3. Technology Based Effluent Limitations and Bases [in Micrograms per Liter (µg/L) Unless Noted Otherwise]

Parameter	AML	MDL	Basis for TBEL
Total Suspended Solids (TSS)	21	30	Treatment Standards and ELGs for other industries
Total Residual Chlorine	342	500	Standard Operating Practices; Water Pollution Control Federation Chlorination of Wastewater (1976)
Total Petroleum Hydrocarbons (TPH)	3.4 mg/L	5 mg/L	Monitoring data, other GPs, ELGs
Benzene	3.4	5	MCL/ID GW Quality Rule
Total BTEX	68.5	100	Model NPDES Permit (1989)
Ethylene Dibromide (EDB)	0.03	0.05	EPA MCL/ID GW Quality Rule
Methyl-Tert-Butyl-Ether (MTBE)	21	30	Monitoring reports from gasoline remediation sites/EPA advisory thresholds
Naphthalene	68.5	100	EPA recommended level for exposure in drinking water
Carbon Tetrachloride	3	5	EPA MCL/ID GW Quality Rule
1,4 Dichlorobenzene (p-DCB)	51	75	EPA MCL/ID GW Quality Rule
1,2 Dichlorobenzene (o-DCB)	411	600	EPA MCL/ID GW Quality Rule
1,3 Dichlorobenzene (m-DCB)	411	600	ID GW Quality Rule
1,1 Dichloroethane (DCA)	1.6	2.4	EPA Region 9 Regional Screening Levels at Superfund Sites
1,2 Dichloroethane (DCA)	3	5	EPA MCL/ID GW Quality Rule
1,1 Dichloroethylene (DCE)	4.8	7	MCL/ID GW Quality Rule
cis-1,2 Dichloroethylene (DCE)	48	70	MCL/ID GW Quality Rule
Dichloromethane (Methylene Chloride)	3	5	MCL/ID GW Quality Rule
Tetrachloroethylene (PCE)	3.4	5	EPA MCL/ID GW Quality Rule
1,1,1 Trichloroethane (TCA)	137	200	EPA MCL
1,1,2 Trichloroethane (TCA)	3	5	EPA MCL/ID GW Quality Rule
Trichloroethylene (TCE)	3.4	5	EPA MCL/ID GW Quality Rule
Vinyl Chloride (Chloroethene)	1.37	2	MCL/ID GW Quality Rule
Pentachlorophenol (PCP)	0.68	1.0	EPA MCL/ID GW Quality Rule
Bis (2-Ethylhexyl) Phthalate	3.3	4.8	EPA Region 9 Regional Screening Levels at Superfund Sites

Parameter	AML	MDL	Basis for TBEL
Benzo (a) Anthracene	0.4	0.6	ML
Benzo (a) Pyrene	0.14	0.2	Idaho GW Quality Rule
Benzo (b) Fluoranthene	1.1	1.6	ML
Benzo (k) Fluoranthene	1.1	1.6	ML
Chrysene	0.4	0.6	ML
Dibenzo (a,h) Anthracene	1.1	1.6	ML
Indeno (1,2,3-cd) Pyrene	0.68	1.0	ML
Acenapthene	137	200	Treatment Technology
Acenapthylene	137	200	Treatment Technology
Anthracene	137	200	Treatment Technology
Benzo (ghi) Perylene	137	200	Treatment Technology
Fluoranthene	137	200	Treatment Technology
Fluorene	137	200	Treatment Technology
Phenanthrene	137	200	Treatment Technology
Pyrene	137	200	Treatment Technology
Total Polychlorinated Biphenyls (PCBs)	0.3	0.5	Idaho GW Quality Rule
Antimony	4.0	6.0	EPA MCL
Arsenic	7.0	10	EPA MCL
Cadmium	3.4	5.0	EPA MCL
Chromium, Total	68.5	100	EPA MCL
Copper	0.89 mg/L	1.3 mg/L	EPA MCL
Lead	10	15	EPA MCL
Mercury	1.4	2.0	EPA MCL
Selenium	34	50	EPA MCL
Iron	685	1,000	National EPA WQ Criterion Recommendation for Aquatic Life
Notes: [1]For the breakdown of these effluent limitations into groundwater remediation facility categories, see Appendix A of this fact sheet. For the details of the rationale behind each of the limits, see Appendix B of this fact sheet.			

B. Water Quality-based Effluent Limitations

For the majority of the effluent COCs proposed to be limited in this Draft GWGP, the proposed TBELs were determined to achieve effluent concentrations that met WQS. The available information indicates that with few exceptions, properly designed and operated treatment units including air stripping and/or activated carbon, can achieve effluent concentrations at laboratory reportable values (often referred to as "non-detection" levels in lab reports). However, for a number of COCs, implementation of the TBELs alone would not meet the State of Idaho's WQS.

Water quality-based effluent limitations (WQBELs) are designed to protect water quality by ensuring that WQS are met in the receiving water. More stringent effluent limitations and conditions may be imposed when TBELs are not sufficient to protect water quality [40 CFR 122.44(d); CWA 301(b)(1)(C)]. The NPDES regulations require that permits include limits on all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality" [40 CFR 122.44(d)(1)(iii)].

The EPA calculated WQBELs for both aquatic life and human health criteria. The most protective limits, when comparing TBELs to WQBELs for any given COC, would apply and therefore be used in calculations deriving the proposed effluent limits in this Draft GWGP. The EPA calculated WQBELs

using the procedures in the *Technical Support Document for Water Quality-based Toxics Control*, [TSD (EPA-505-2-90-001, March 1991)]. WQBELs are discussed in more detail below.

Idaho's Surface Water Quality Standards

For the purposes of the Draft GWGP, the numeric criteria for toxic substances promulgated in the State of Idaho WQS were used as the basis for establishing the WQBELs (IDAPA 58.01.02.210). All discharges to surface waters in Idaho must comply with state WQS, including the state's antidegradation policy and authorization of a mixing zone for any WQBELs, and with any additional requirements imposed by the state as part of its certification of NPDES permits under CWA § 401.

The toxics criteria table found in the Idaho WQS at 58.01.02.210 includes numeric criteria for the protection of aquatic life uses of the water (criteria to protect against acute and chronic effects on aquatic life), and human health uses of the water (for the consumption of water and organisms; i.e., drinking water and eating fish, or the consumption of organisms only). Some of the toxic criteria are more stringent since the EPA issuance of the 2007 GWGP. The State of Idaho submitted revised, and state-adopted, numeric criteria for toxic substances for human health protection to the EPA in July 2006 for action under Section 303(c) of the CWA. These criteria were disapproved by the EPA. However, because the 2006 criteria adopted pursuant to State law are more stringent than those approved by EPA (in 1996), in accordance with Section 301(b)(1)(C) of the CWA, the EPA used Idaho's more stringent 2006 criteria in developing the WQBELs for the Draft GWGP. The draft § 401 certification issued by IDEQ for the Draft GWGP includes language in the certification conditions to use the 2006 criteria in calculating WQBELs for the Draft GWGP. See Appendix E for the draft § 401 certification issued by IDEQ.

In addition to the numeric criteria for toxic substances, other WQBELs in the Draft GWGP are based on surface water quality criteria for specific aquatic use designations [IDAPA 58.01.02.250-253] and also the state narrative water quality criteria [IDAPA 58.01.02.200].

C. Expression of Effluent Limits

Most permits contain both concentration and mass based effluent limits. Mass based effluent limits are often imposed to ensure that dilution is not used as a substitute for treatment. Alternatively, in the absence of concentration limits, a Permittee would be able to increase its effluent concentration (i.e., reduce the level of treatment) during periods of low flow and still meet its mass-based effluent limit. Because it is anticipated that many of the facilities seeking coverage under the GWGP will be discharging over a range of critical low flow receiving water volumes that will vary considerably as a percentage of their average flow, the Draft GWGP includes concentration based effluent limits. However, the permit specifically prohibits the use of dilution as a form of treatment, or as a means for which to comply with the permit limitations.

The federal NPDES regulation found at 40 CFR 122.45(d)(1) requires that effluent limitations for continuous dischargers be expressed, unless impracticable, as both maximum daily limits (MDL) and average monthly limits (AML) values. In accordance with 40 CFR 122.2, "continuous discharge" means a discharge which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities. The Draft GWGP includes both AMLs and MDLs for continuous discharges. A discharge which occurs continuously during certain months of the year is considered a seasonal continuous discharge, and as such, both AML and MDLs are required.

D. Calculation of Effluent Limits

The methodology used to develop WQBELs in the Draft GWGP follows:

Effluent Limits based on Human Health Criteria

For effluent limits derived from the human health criteria in the State of Idaho's WQS, each criterion (Water + Organisms as well as Organisms Only) was set equal to the wasteload allocation (WLA) for each parameter that is able to be assimilated by the receiving water at the end of the pipe. That WLA was set to equal the AML in the Draft GWGP (Criterion = WLA = AML) as per the guidance in the EPA TSD, when permitting for human health protection (Pages 104-105).

MDLs were also calculated using the EPA TSD recommendations for permitting for human health protection on Pages 104-105. The recommended approach is to calculate the MDL based on effluent variability and the number of samples per month using the multipliers in Table 5-3 of the TSD. The TSD includes this table of multipliers for calculating MDLs from AMLs, Table 5-3, on Page 106.

Using a sample size of n=1, and the recommended default measure of effluent variability (coefficient of variation, or CV) of 0.6, the ratio between AMLs and MDLs is 1.46. Therefore, all the calculated MDLs in the Draft GWGP based on Idaho's human health criteria are 1.46 times higher than the AMLs based on Idaho's human health criteria.

In cases where the receiving water for a facility authorized to discharge under this GWGP is designated with the beneficial use of Domestic Water Supply (DWS) in the State of Idaho WQS, the applicable effluent limits will be those based on the "Water + Organism" human health criteria. In cases where the receiving water for a facility authorized to discharge under this general permit is not designated with the beneficial use of DWS in the state of Idaho WQS, the effluent limits are based on the "Organism Only" human health criteria. This fact sheet shows the effluent limits as proposed in the Draft GWGP for both categories of designated uses.

Effluent Limits based on Aquatic Life Criteria

Both AMLs and MDLs were calculated using the EPA TSD recommendations for permitting for aquatic life protection found on Pages 98-102. Permit limits based on aquatic life criteria are established using a value corresponding to a percentile of the selected probability distribution of the effluent concentrations (95th percentile for AMLs, 99th percentile for MDLs).

A WLA is calculated from both the acute and the chronic aquatic life water quality criterion. But, as acute effects to aquatic life are limited based on one (1)-hour exposures at critical conditions, and chronic effects to aquatic life are limited based on four (4)-day exposures at critical conditions, the WLAs calculated from each criterion are converted to long term averages (LTAs) for an accurate comparison of the assimilative capacity of the receiving water. The acute and chronic LTAs are then compared, and the limiting LTA is used in the equations to calculate the AMLs and MDLs. The acute and chronic life water quality criterion was set equal to the acute WLA and chronic WLA, accordingly. See Figure 1, below, for more details.

Figure 1. Calculation of Water Quality Based Effluent Limitations

Water quality-based effluent limits (WQBELs) are calculated by the two-value wasteload allocation (WLA) process as described on Page 100 of the TSD (EPA, 1991) and shown below:

1. Calculate the acute wasteload allocation ($WLA_{a)}$ by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic wasteload allocation (WLA_c) by multiplying the chronic criteria by the chronic dilution factor (DF) and subtracting the background factor.

   WLA_a = (acute criteria x DF_a) – [(background conc. x (DF_a - 1)]

   WLA_c = (chronic criteria x DF_c) – [(background conc. x (DF_c -1)]
   where: DF_a = Acute Dilution Factor
   DF_c = Chronic Dilution Factor

2. Calculate the long term averages (LTA_a and LTA_c) which will comply with the wasteload allocations WLA_a and WLA_c.

   $LTA_a = WLA_a \times e^{[0.5\sigma^2 - z\sigma]}$ where: $\sigma^2 = \ln[CV^2 + 1]$
   z = 2.326 (99th percentile occurrence)
   CV = coefficient of variation = std. deviation/mean

   $LTA_c = WLA_c \times e^{[0.5\sigma^2 - z\sigma]}$ where: $\sigma^2 = \ln[(CV^2 \div 4) + 1]$
   z = 2.326 (99th percentile occurrence)

3. Use the smallest LTA of the LTA_a or LTA_c to calculate the maximum daily effluent limit and the monthly average effluent limit.

   Maximum Daily Limit = MDL

   $$MDL = LTA x e^{(Z\sigma - 0.5\sigma^2)}$$ where: $\sigma^2 = \ln[CV^2 + 1]$
   z = 2.326 (99th percentile occurrence)
   LTA = Limiting long term average

   Average Monthly Limit = AML

   $$AML = LTA x e^{(Z\sigma_n - 0.5\sigma_n^2)}$$ where: $\sigma^2 = \ln[(CV^2 \div n) + 1]$
   n = number of samples/month
   (use minimum n=4, reference TSD section 5.5.3)
   z = 1.645 (95th % occurrence probability)
   LTA = Limiting long term average

Table 4. Proposed Water Quality Based Effluent Limitations and Bases

Parameter	AML (in µg/L unless noted)	MDL (in µg/L unless noted)	Designated Use in Idaho WQS Linked to Specific Water Quality Criteria Used as Basis for Limits	Human Health - Domestic Water Supply (DWS) Designated Use Results in Different Water Quality Criteria Used as Basis
Total Residual Chlorine (TRC)	9	18	Aquatic Life	
pH	Not less than 6.5 or greater than 9.0 standard units (s.u.)		Aquatic Life	
Benzene	2.2	3.2	Human Health	DWS
Carbon Tetrachloride	0.23	0.34	Human Health	DWS
Carbon Tetrachloride	1.6	2.3	Human Health	
1,2 Dichloroethane (DCA)	0.38	0.55	Human Health	DWS
Tetrachloroethylene (PCE)	0.69	1.01	Human Health	DWS
Tetrachloroethylene (PCE)	3.3	4.8	Human Health	
1,1,2 Trichloroethane (TCA)	0.59	0.86	Human Health	DWS
Trichloroethylene (TCE)	2.5	3.7	Human Health	DWS
Vinyl Chloride (Chloroethene)	0.025	0.037	Human Health	DWS
Pentachlorophenol (PCP)	0.27	0.39	Human Health	DWS
Bis (2-Ethylhexyl) [Di-(ethylhexyl) Phthalate]	1.2	1.8	Human Health	DWS
Bis (2-Ethylhexyl) [Di-(ethylhexyl) Phthalate]	2.2	3.2	Human Health	
Benzo (a) Anthracene	0.0038	0.0055	Human Health	DWS
Benzo (a) Anthracene	0.018	0.026	Human Health	
Benzo (a) Pyrene	0.0038	0.0055	Human Health	DWS
Benzo (a) Pyrene	0.018	0.026	Human Health	
Benzo (b) Fluoranthene	0.0038	0.0055	Human Health	DWS
Benzo (b) Fluoranthene	0.018	0.026	Human Health	
Benzo (k) Fluoranthene	0.0038	0.0055	Human Health	DWS

Parameter	AML (in µg/L unless noted)	MDL (in µg/L unless noted)	Designated Use in Idaho WQS Linked to Specific Water Quality Criteria Used as Basis for Limits	Human Health - Domestic Water Supply (DWS) Designated Use Results in Different Water Quality Criteria Used as Basis
Benzo (k) Fluoranthene	0.018	0.026	Human Health	
Chrysene	0.0038	0.0055	Human Health	DWS
Chrysene	0.018	0.026	Human Health	
Dibenzo (a,h) anthracene	0.0038	0.0055	Human Health	DWS
Dibenzo (a,h) anthracene	0.018	0.026	Human Health	
Indeno (1,2,3-cd) Pyrene	0.0038	0.0055	Human Health	DWS
Indeno (1,2,3-cd) Pyrene	0.018	0.026	Human Health	
Fluoranthene	130	190	Human Health	DWS
Total Polychlorinated Biphenyls (PCBs)	0.000064	0.000093	Human Health	
Cadmium[2]	0.1	0.2	Aquatic Life	
Chromium III[2]	22.7	45.5	Aquatic Life	
Chromium VI	8	16	Aquatic Life	
Copper[2,3]	6.17 (Boise River Segment SW-5)	12.4 (Boise River Segment SW-5)	Aquatic Life	
Copper	2.4 (all other Idaho receiving waters)	4.8 (all other Idaho receiving waters)	Aquatic Life	
Lead[3]	0.91 (Boise River Segment SW-5)	1.83 (Boise River Segment SW-5)	Aquatic Life	
Lead	0.45 (all other Idaho receiving waters)	0.9 (all other Idaho receiving waters)	Aquatic Life	
Mercury[4]	0.01	0.02	Human Health	
Methylmercury[4]	--	--	Aquatic Life	
Nickel[2]	13.2	26.5	Aquatic Life	
Selenium	4.1	8.2	Aquatic Life	
Silver[2]	0.19	0.4	Aquatic Life	
Zinc[2]	18	37	Aquatic Life	
Iron	685	1,000	National EPA Recommendation: Aquatic Life	
Cyanide	4.3	8.5	Aquatic Life	

Notes: [1]If any contaminants of concern are present in detectable levels in the effluent, but not identified in this table, the contaminants and their influent/effluent concentrations must be provided on the NOI for EPA and IDEQ to review. For the breakdown of these proposed effluent limitations into the facility subcategories, see Appendix A of this fact sheet. For the details of the rationale behind each of these limits, see Appendix B of this fact sheet.

[2] These metals criteria are hardness dependent. Limits shown represent calculations using a hardness value of 25 mg/L, except for cadmium which uses 10 mg/L for hardness.

[3] The Idaho WQS specify that for the Boise River Segment SW-5, the Water Effects Ratio (WER) value used in the equations for calculating copper and lead criteria values shall be 2.578 for copper and 2.049 for lead. For discharges into this segment, the applicable effluent limits will apply.

[4]If mercury is detected in effluent samples the Permittee must develop a Methylmercury (fish tissue) Monitoring Plan. The Plan must be submitted to EPA/IDEQ for approval. Depending on the location of the discharge, it could be possible to join the cooperative methylmercury monitoring efforts underway in the Boise River area. At each sample location where fish are collected a surface water sample must be collected and analyzed for total mercury using an analytical method which achieves a ML of 0.5 ng/L (0.0005 µg/L) or lower. EPA Guidance recommends Methods 1631E or 245.7 for analyzing mercury in water.

E. Minimum Levels

Minimum Levels (ML) are the lowest level at which the laboratory analytical testing method provides a detectable concentration of the parameter in the water sample. The term is defined by EPA at 40 CFR Part 136. The ML represents the lowest concentration at which the concentration of a parameter can be measured with a known level of confidence. The Interim ML, in the absence of an EPA promulgated ML, can be calculated by multiplying the published method detection limit (MDL) for the parameter from a specific method approved under CWA Section 304(h) or previously approved for use by the permitting authority by 3.18. Some parameters have calculated WQBELs that are below the ML or Interim ML. In these cases, the Permittee will be in compliance with the WQBEL if the effluent concentration analyzed is below the ML. All water samples must be analyzed using EPA approved analytical methods, and must be analyzed using a sufficiently sensitive method that will detect the concentration of the parameter if it is present.

Table 5. Minimum Levels Applicable in the Idaho Groundwater Remediation GP

Parameter	ML/Interim ML
Total Residual Chlorine	50 µg/L
Carbon tetrachloride (DWS designation only)	2.0 µg/L
1,1 DCA	2.0 ug/L
1,2 DCA (DWS designation only)	2.0 µg/L
Dichloromethane (Methylene Chloride)	10.0 µg/L
PCE (DWS designation only)	2.0 µg/L
1,1,2 TCA (DWS designation only)	2.0 µg/L
Vinyl chloride (DWS designation only)	2.0 µg/L
Pentachlorophenol	1.0 µg/L
Bis (2-ethylhexyl) phthalate	0.5 µg/L
Benzo (a) anthracene	0.6 µg/L
Benzo (a) pyrene	1.0 µg/L
Benzo (b) Fluoranthene	1.6 µg/L
Benzo (k) Fluoranthene	1.6 µg/L
Chrysene	0.6 µg/L
Dibenzo (a,h) anthracene (DWS designation only)	1.6 µg/L
Indeno (1,2,3-cd) pyrene (DWS designation only)	1.0 µg/L
Total Polychlorinated Biphenyls (PCBs)	0.5 µg/L– Use EPA approved Methods 608 or 1668
Cadmium	0.25 µg/L
Lead	0.5 µg/L
Silver	0.2 µg/L

Cyanide	10.0 µg/L

F. Mixing Zone Considerations

A mixing zone is an allocated impact zone where state WQS can be exceeded so long as acutely toxic conditions are prevented. It is a defined area or volume of the receiving water adjacent to or surrounding a wastewater discharge where the receiving water, as a result of the discharge, may not meet all applicable water quality criteria. Mixing zones should be as small as practicable. A mixing zone is considered a place where wastewater mixes with receiving water and is based upon the dilution available and the assimilative capacity of the receiving water.

IDEQ's Policy

The EPA allows states to adopt mixing zone regulations as part of the state's WQS [40 CFR 131.13]. IDEQ's mixing zone policy is stated in IDAPA 58.01.02.060. Mixing zones for purposes of this GWGP will follow IDEQ's policy, which includes:

- Cumulative width of adjacent mixing zones when measured across the receiving water is not to exceed fifty percent (50%) of the total width of the receiving water at that point;
- Width of a mixing zone is not to exceed twenty-five percent (25%) of the stream width or three hundred (300) meters plus the horizontal length of the diffuser as measured perpendicularly to the stream flow, whichever is less; and
- Limited to 25% of the appropriate critical low flow volume for fluvial receiving waters no closer to the ten (10) year, seven (7) day low-flow shoreline than fifteen percent (15%) of the stream width.
- For all waters for which IDEQ has determined mixing zones to be applicable, the criteria apply at the appropriate locations specified within or at the boundary of the mixing zone(s); otherwise the criteria apply through the waterbody including at the end of any discharge pipe, canal, or other discharge point.

Request for Mixing Zone

While the proposed WQBELs are applied at the end-of-pipe, facilities seeking coverage under this GWGP may apply for and obtain a mixing zone through submission of the required NOI information to the EPA and IDEQ. In order to receive a mixing zone for a specific COC, a facility must first request on the NOI that IDEQ, or an affected tribe with treatment in a manner similar to a state (TAS) for the NPDES program, and the EPA consider a mixing zone. The draft § 401 certification from IDEQ clarifies that mixing zones must be authorized by the state on a case-by-case basis. See Part I.J of the Draft GWGP and Appendix E of this fact sheet.

In the NOI, the Permittee requesting a mixing zone also must calculate a dilution factor (DF) as follows:

Figure 2. Dilution Factor Equation

$$DF = \frac{Q_e + Q_u \times \%MZ}{Q_e}$$

Where:

DF = Dilution Factor
Q_e = Maximum flow rate of the discharge in cubic feet per second (cfs) (1 gpm = 0.00223 cfs)
Q_u = Receiving water low flow rate upstream of the discharge (1Q10, 7Q10, 30B3, etc)

%MZ = Percent Mixing Zone

Low flows for the receiving water may be estimated by use of available information such as nearby USGS stream gauging station, using historic stream flow data, calculations based on drainage area, information from state water quality offices, or other means. Whichever method is selected, the source of the low flow value(s) used by the applicant must be included on NOI. Stream flow data from USGS gauge sites can be downloaded at the following web site: http://nwis.waterdata.usgs.gov/usa/nwis/discharge. In addition, the computer software program DFLOW is a flow analysis tool for calculating 7Q10 and other critical low flow values, and can be downloaded at http://water.epa.gov/scitech/datait/models/dflow/index.cfm

After the proper information for the mixing zone request is submitted on the NOI, IDEQ, or a tribe with TAS, will consider this request and determine if a mixing zone is appropriate for the particular receiving water and COC(s). IDEQ, or a tribe with TAS, may also require biological information about the receiving water in order to determine if a mixing zone is appropriate. Lastly, IDEQ or a tribe with TAS provides the CWA § 401 certification that grants the Permittee the mixing zone.

The EPA will provide a public notice on any revised limits for the facility as a result of IDEQ's mixing zone determination before sending written authorization to discharge, granting the facility coverage under the GWGP. Comments on the state § 401 certification may be directed to IDEQ (See Page 2 of this fact sheet). Subsequent to the EPA public comment process, the mixing zone decision document/ § 401 certification will be attached to EPA's written authorization to discharge.

Mixing zones are available on a case-by-case basis for specific COCs with WQBELs. TBELs do not address water quality considerations, and therefore, mixing zones do not apply to TBELs. They represent the minimum level of treatment that must be imposed in a permit under CWA § 402 [40 CFR 125.3(a)]. A mixing zone allowance cannot permit the discharge of a COC that would exceed the TBEL for that particular COC; therefore, the TBEL is the effective ceiling on any mixing zone allowance that would be granted.

Table 6. Complete Table of Proposed Effluent Limitations

		WQBEL (No Mixing Zone)		TBEL		
Parameter	Expired Permit Limit in µg/L	AML in µg/L unless noted	MDL in µg/L unless noted	AML in µg/L unless noted	MDL in µg/L unless noted	ML/IML in µg/L unless noted
Total Suspended Solids (TSS)	30	--	--	21	30	--
Total Residual Chlorine	11	9	18	342	500	50
pH	--	Not less than 6.5 and not more than 9.0 standard units.		--	--	--
Total Petroleum Hydrocarbons (TPH)	5 mg/L	--	--	3.4 mg/L	5.0 mg/L	--
Benzene	1.2	2.2 (DWS)	3.2 (DWS)	3.4	5.0	--
Total BTEX	100	--	--	68	100	--
EDB	0.05	--	--	0.03	0.05	--
MTBE	30	--	--	21	30	--
Naphthalene	100	--	--	68	100	--
Carbon Tetrachloride[2]	0.25	0.23 (DWS)	0.34 (DWS)	3.4	5.0	2.0
Carbon Tetrachloride	0.25	1.6	2.3	3.4	5.0	2.0
1,4 Dichlorobenzene (p-DCB)	75	--	--	51	75	--
1,2 Dichlorobenzene (o-DCB)	600	--	--	411	600	--
1,3 Dichlorobenzene (m-DCB)	5.5	--	--	411	600	--
1,1 Dichloroethane (DCA)	810	--	--	1.6	2.4[3]	2.0
1,2 Dichloroethane (DCA)[2]	0.38	0.38 (DWS)	0.55 (DWS)	3.4	5	2.0
1,1 Dichloroethylene (DCE)	0.057	--	--	5	7	--
cis-1,2 Dichloroethylene (DCE)	70	--	--	48	70	--
Dichloromethane (Methylene Chloride)	4.7	--	--	3.0	5.0	10.0
Tetrachloroethylene (PCE)[2]	0.8	0.69 (DWS)	1.01 (DWS)	3.4	5.0	2.0
Tetrachloroethylene (PCE)	0.8	3.3	4.8	3.4	5.0	2.0
1,1,1 Trichloroethane (TCA)	200	--	--	137	200	--
1,1,2 Trichloroethane[2](TCA)	0.6	0.59 (DWS)	0.86 (DWS)	3.4	5.0	2.0

		WQBEL (No Mixing Zone)		TBEL		
Parameter	Expired Permit Limit in µg/L	AML in µg/L unless noted	MDL in µg/L unless noted	AML in µg/L unless noted	MDL in µg/L unless noted	ML/IML in µg/L unless noted
Trichloroethylene(TCE)[2]	2.7	2.5 (DWS)	3.7 (DWS)	3.4	5.0	--
Vinyl Chloride[2] (Chloroethene)	2.0	0.025 (DWS)	0.037 (DWS)	1.4	2.0	2.0
Pentachlorophenol(PCP)[2]	0.28	0.27 (DWS)	0.39 (DWS)	0.68	1.0	1.0
Bis (2-Ethylhexyl) [Di-(ethylhexyl)] Phthalate[2]	1.8	1.2 (DWS)	1.8 (DWS)	3.3	4.8[3]	--
Bis (2-Ethylhexyl) [Di-(ethylhexyl)] Phthalate	1.8	2.2	3.2	3.3	4.8[3]	--
Benzo (a) Anthracene[2]	0.0028	0.0038 (DWS)	0.0055 (DWS)	0.4	0.6	0.6
Benzo (a) Anthracene	0.0028	0.018	0.026	0.4	0.6	0.6
Benzo (a) Pyrene[2]	0.0028	0.0038 (DWS)	0.0055 (DWS)	0.14	0.2	1.0
Benzo (a) Pyrene	0.0028	0.018	0.026	0.14	0.2	1.0
Benzo (b) Fluoranthene[2]	0.0028	0.0038 (DWS)	0.0055 (DWS)	1.1	1.6	1.6
Benzo (b) Fluoranthene	0.0028	0.018	0.026	1.1	1.6	1.6
Benzo (k) Fluoranthene[2]	0.0028	0.0038 (DWS)	0.0055 (DWS)	1.1	1.6	1.6
Benzo (k) Fluoranthene	0.0028	0.018	0.026	1.1	1.6	1.6
Chrysene[2]	0.0028	0.0038 (DWS)	0.0055 (DWS)	0.4	0.6	0.6
Chrysene	0.0028	0.018	0.026	0.4	0.6	0.6
Dibenzo (a,h) anthracene[2]	0.0028	0.0038 (DWS)	0.0055 (DWS)	1.1	1.6	1.6
Dibenzo (a,h) anthracene	0.0028	0.018	0.026	1.1	1.6	1.6
Indeno (1,2,3-cd) Pyrene[2]	0.0028	0.0038 (DWS)	0.0055 (DWS)	0.68	1.0	1.0
Indeno (1,2,3-cd) Pyrene	0.0028	0.018	0.026	0.68	1.0	1.0
Acenapthene	200	--	--	137	200	--
Acenapthylene	200	--	--	137	200	--
Anthracene	200	--	--	137	200	--
Benzo (ghi) Perylene	200	--	--	137	200	--
Fluoranthene	200	130 (DWS)	190 (DWS)	--	--	--
Fluoranthene	200	--	--	137	200	
Fluorene	200	--	--	137	200	--
Phenanthrene	200	--	--	137	200	--
Pyrene	200	--	--	137	200	--

		WQBEL (No Mixing Zone)		TBEL		
Parameter	Expired Permit Limit in µg/L	AML in µg/L unless noted	MDL in µg/L unless noted	AML in µg/L unless noted	MDL in µg/L unless noted	ML/IML in µg/L unless noted
Total PCBs	0.00017	0.000064	0.000093	0.3	0.5	0.5
Antimony	5.6	--	--	4.0	6.0	--
Arsenic	10	--	--	7.0	10.0	--
Cadmium[4]	1.1	0.1	0.2	3.4	5	0.25
Chromium III[4]	86	22.7	45.5	68.5 total Chromium	100 total Chromium	--
Chromium VI	11	8	16	--	--	--
Copper[4,5]	11.5	6.17 (Boise River Segment SW-5)	12.4 (Boise River Segment SW-5)	0.89 mg/L	1.3 mg/L	2.0
		2.4 (all other Idaho receiving waters)	4.8 (all other Idaho receiving waters)			
Lead[4,5]	3.16	0.91 (Boise River Segment SW-5)	1.83 (Boise River Segment SW-5)	10.0	15.0	0.5
		0.45 (all other Idaho receiving waters)	0.9 (all other Idaho receiving waters)			
Mercury[6]	0.012	0.01	0.02	1.4	2.0	--
Nickel[4]	52	13.2	26.5	--	--	--
Selenium	5.0	4.1	8.2	34	50	--
Silver[4]	4.0	0.19	0.4	--	--	--
Zinc[4]	122	18	37	--	--	--
Iron	1,000	685	1,000	--	--	--
Cyanide	5.2	4.3	8.5	--	--	10

Footnotes:

[1]If any contaminants of concern are present in detectable levels in the effluent, but not identified in this table, the contaminants and their influent/effluent concentrations must be provided on the NOI for EPA and IDEQ to review. For the breakdown of these effluent limitations into the facility subcategories, see Appendix A of this fact sheet. For the details of the rationale behind each of these limits, see Appendix B of this fact sheet.

[2]WQBELs with (DWS) are the limits for facilities that discharge to surface waters designated for Domestic Water Supply in the State of Idaho WQS. Facilities discharging to all other surface waters in the State of Idaho must comply with the second set of WQBELs (without the "DWS" in parenthesis).

[3]Region 9 Screening Levels for Chemicals at Superfund Sites found at http://www.epa.gov/region9/superfund/prg, New Summary Table, Tapwater Value (Column X)

[4] These metals criteria are hardness dependent. Limits shown represent calculations using a hardness value of 25 mg/L, except for cadmium which uses 10 mg/L for hardness.

[5] The Idaho WQS specify that for the Boise River Segment SW-5, the Water Effects Ratio (WER) value used in the equations for calculating copper and lead criteria values shall be 2.578 for copper and 2.049 for lead, so the limits for copper and lead for the Boise River Segment SW-5 are different than for all other surface waters in the State of Idaho.

[6] If mercury is detected in effluent samples, the Permittee must develop a Methylmercury (fish tissue) Monitoring Plan. The Plan must be submitted to EPA/IDEQ for approval. Depending on the location of the discharge, it could be possible to join the cooperative methylmercury monitoring efforts underway in the Boise River area. Note that the EPA recommended

analytical method for mercury, Method 1631, has an ML of 0.5 nanograms/L. Labs in Idaho should be using Method 1631 to analyze mercury and therefore, the Permittee should report levels in the DMR even if the level is below the limit listed here.

G. Limits on Non-Continuous Dischargers

The federal regulation at 40 CFR 122.45(e) allows non-continuous discharges to be described and limited considering the following factors, as appropriate: 1) frequency of discharge; 2) total mass of the pollutant discharged per batch; 3) maximum rate of discharge of pollutants per batch; and, 4) expression of limits using the appropriate measure (i.e., concentration, mass, etc.).

EPA proposes that for facilities seeking coverage under this GWGP that have non-continuous discharges, the MDL for each of the COCs in the self-identified category will apply.

AMLs are not applicable to non-continuous dischargers because of the infrequency at which the discharge will occur. However; seasonal discharges from groundwater remediation facilities are not considered "non-continuous discharges" if the facility is discharging continuously during a portion of the year. Instead, those seasonal discharges will be authorized under this GWGP in a manner similar to continuous discharges; therefore, both AMLs and MDLs, as well as the monitoring requirements for continuous dischargers, will apply.

H. Antidegradation and Clean Water Act Section 401 Certification

In addition to TBELs or WQBELs for pollutants that could cause or contribute to exceedances of numeric or narrative criteria, EPA must consider the state's antidegradation policy which is included in the state's CWA §401 certification of the permit.

Under Idaho's Antidegradation Policy [IDAPA 58.01.02.051], a water body is afforded Tier 1, Tier 2, or Tier 3 protections depending on the support status of the beneficial uses that are either designated in Idaho's Water Quality Standards [IDAPA 58.01.02, Sections 110-160] or have been determined to exist in that water body [IDAPA 58.01.02.010.37].

The IDEQ employs a water body-by-water body approach to implementing its antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality [IDAPA 58.01.02.052.05.a]. Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met [IDAPA 58.01.02.052.05.c]. The most recent federally-approved Integrated Report and supporting data are used to determine support status and the tier of protection [IDAPA 58.01.02.052.05].

- Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected [IDAPA 58.01.02.051.01; 58.01.02.052.01]. The proposed permit would allow discharges to Tier 1 waters as long as the discharge meets the appropriate water quality standards at the point of discharge, prior to mixing with the receiving waters.

- Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development [IDAPA 58.01.02.051.02; 58.01.02.052.08]. Discharges to Tier 2 waters can only be covered under this general permit if DEQ provides an individual CWA §401 certification to the applicant. The individual certification will include an evaluation of the effect of the discharge on water quality in the

receiving water body (IDAPA 58.01.02.052.06) and will be included in EPA's discharge authorization letter to the applicant.

- Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters (ORWs) and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09). The State of Idaho has not yet designated any waters as ORWs; however, should waters become designated as such during the five year cycle of this permit, those waters shall be excluded from coverage under the permit. Discharges to Tier 3 waters will be required to obtain an individual NPDES permit by EPA, and individual § 401 certification by IDEQ.

See Appendix E for the state's draft CWA§ 401 certification. The EPA has reviewed Idaho's antidegradation review and finds that it is consistent with the § 401 certification requirements and the State's antidegradation implementation procedures. Comments on the § 401 certification, including the antidegradation review, can be submitted to the IDEQ as set forth above (see the State Certification Section at the beginning of this document).

I. Antibacksliding

Section 402(o)(2) of the Clean Water Act and federal regulations at 40 CFR 122.44 (l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions. Section 402(o)(1) of the CWA states that a permit may not be reissued with less stringent limits established based on Sections 301(b)(1)(C), 303(d) or 303(e) (i.e. WQBELs or limits established in accordance with state treatment standards) except in compliance with Section 303(d)(4). Section 402(o)(1) also prohibits backsliding on TBELs established using BPJ [i.e. based on Section 402(a)(1)(B)].

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy and as long as the provisions at CWA 303(d)(4) are met.

An anti-backsliding analysis was done for the revised proposed effluent limitations in the Draft GWGP. Out of a group of 49 COCs with TBELs established in this Draft GWGP, 21 COCs retained the TBELs from 2007 and 28 COCs have revised TBELs due to a change in the basis for the TBEL, noted in Table 3 above. 27 TBEL MDLs are higher than in the previous permit, 1 TBEL is lower. The WQBELs in the Draft GWGP have also been revised since 2007. In the case of the water quality limits, 3 WQBELs are higher than in the previous permit and 27 WQBELs are lower. As stated previously, EPA based the Draft GWGP WQBEL calculations on Idaho's revised WQS from 2006, accounting for DWS and other use designations, and set the water quality criterion for each COC equal to the WLA, which was set equal to the AML, as per the 1991 EPA TSD. The MDL for each COC was also calculated per the TSD.

In addition, EPA proposes the removal of the effluent limitation for temperature, found in the 2007 GWGP on page 18 (Section II.A.8). That narrative limitation, written to ensure that covered Permittees met the Idaho WQS for temperature at the end of the pipe, was included in the 2007 GWGP without any data to assess the reasonable potential (RP) of a Permittee to cause or contribute to a violation of the state's temperature criteria. In this proposed GWGP, EPA has included a requirement for continuous temperature monitoring of the effluent at each permitted facility. This requirement will allow for the collection and maintenance of a data set to assess the RP of the covered facilities to cause or contribute

to a violation of the state's temperature criteria and support the development of any necessary temperature limits in the next permit cycle for the GWGP.

EPA determined that all of the revised effluent limits in the Draft GWGP protect water quality in a manner consistent with the State of Idaho's antidegradation policy, and therefore, any revised limits that are less stringent than in the previous permit are not prohibited by the backsliding provisions in the CWA. EPA has since received the draft CWA § 401 certification from IDEQ that the state's WQS will be met with the conditions and limitations included in the Draft GWGP.

VI. Monitoring and Reporting Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and the federal regulation found at 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The Permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to the EPA. Permittees must analyze water samples using a sufficiently sensitive EPA approved analytical method.

B. Monitoring Location(s)

Based upon the information reported in the NOI, all facilities covered by the GWGP are required to monitor for applicable parameters and pollutants at the last point in the treatment train before the treated effluent leaves the facility for compliance with the permit limitations described in Section IV of this fact sheet. Because dilution cannot be used as a form of treatment, and because facilities may be mixing treated effluent with stormwater runoff or other waters prior to discharging to receiving waters, a dedicated sampling point at each facility must be designated at the end of the treatment train.

C. Monitoring Frequencies

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

In general, facilities that are continuous dischargers will be required to monitor for those parameters identified in Appendix A for whichever "site type" most closely matches their facility and is reported to EPA and IDEQ with the required NOI information. The EPA proposes in the Draft GWGP that **continuous dischargers must monitor effluent continuously for flow and temperature, weekly for pH, and monthly for all other COCs limited in the facility's category**. This is increased monitoring compared with the 2007 GWGP. The 2007 GWGP only required quarterly monitoring; however, EPA believes that the increased monitoring is necessary to adequately assess facility compliance with the permit limits. However, if after 12 months of monitoring, a facility demonstrates that a particular COC is not present, then the facility will be required to **only monitor annually for that pollutant into the future**. Annual reporting will continue to be required for all COCs identified by a facility's category, regardless of the pollutant being present in the facility's discharge. Permittees are not required to monitor when the facility is not discharging during the reporting period. However, the DMR must indicate that the facility is not discharging and must be submitted as described in the GWGP Part V.D.

Some parameters, such as total suspended solids (TSS) and the metals, must be sampled using the 24-hour composite sampling method. 24-hour composite sampling is defined in this GWGP as a flow-proportioned mixture of not less than four discrete representative samples collected at the same discharge point within the same 24 hours. Other samples, such as the VOCs and pH, must be grab samples. And, the effluent flow and temperature must be monitored continuously using recording devices.

See Appendix A of this fact sheet for the parameters required to be monitored in each groundwater remediation facility category.

The monitoring requirements for **non-continuous dischargers** will be to monitor **weekly** for all COCs limited in the facility's category, **during the weeks that the facility is discharging.**

Table 7. Monitoring Requirements

Parameter	Monthly Effluent Monitoring Requirements (Unless Otherwise Specified)
Total Suspended Solids (TSS)	24-hr Composite
Total Residual Chlorine	Grab
Temperature	Continuous
pH	Weekly Grab
Flow	Continuous
Total Petroleum Hydrocarbons (TPH)	Grab
Benzene	Grab
Total BTEX	Grab
Ethylene Dibromide (EDB)	Grab
Methyl-Tert-Butyl-Ether (MTBE)	Grab
Naphthalene	Grab
Carbon Tetrachloride	Grab
1,4 Dichlorobenzene (p-DCB)	Grab
1,2 Dichlorobenzene (o-DCB)	Grab
1,3 Dichlorobenzene (m-DCB)	Grab
1,1 Dichloroethane (DCA)	Grab
1,2 Dichloroethane (DCA)	Grab
1,1 Dichloroethylene (DCE)	Grab
cis-1,2 Dichloroethylene (DCE)	Grab
Dichloromethane (Methylene Chloride)	Grab
Tetrachloroethylene (PCE)	Grab
1,1,1 Trichloroethane (TCA)	Grab
1,1,2 Trichloroethane (TCA)	Grab
Trichloroethylene (TCE)	Grab
Vinyl Chloride (Chloroethene)	Grab
Pentachlorophenol (PCP)	Grab
Bis (2-Ethylhexyl) [Di-(ethylhexyl) Phthalate]	Grab
Benzo (a) Anthracene	Grab
Benzo (a) Pyrene	Grab
Benzo (b) Fluoranthene	Grab
Benzo (k) Fluoranthene	Grab
Chrysene	Grab
Dibenzo (a,h) anthracene	Grab
Indeno (1,2,3-cd) Pyrene	Grab
Acenapthene	Grab
Acenapthylene	Grab

Anthracene	Grab
Benzo(ghi) Perylene	Grab
Fluoranthene	Grab
Fluorene	Grab
Phenanthrene	Grab
Pyrene	Grab
Total Polychlorinated Biphenyls (PCBs)	Grab
Antimony	Grab
Arsenic	24-hr Composite
Cadmium	24-hr Composite
Chromium III	24-hr Composite
Chromium VI	24-hr Composite
Copper	24-hr Composite
Lead	24-hr Composite
Mercury	24-hr Composite
Nickel	24-hr Composite
Selenium	24-hr Composite
Silver	24-hr Composite
Zinc	24-hr Composite
Iron	24-hr Composite
Cyanide	24-hr Composite

D. Submission of Discharge Monitoring Reports

Facilities covered by the GWGP will be required to submit DMRs to EPA Region 10, the appropriate IDEQ Regional Office, and any affected tribe. The Draft GWGP includes a provision to require the Permittee to submit DMR data electronically via a secure internet application using NetDMR, a national web-based tool, within six months of the effective date of the Permit. NetDMR allows participants to discontinue mailing in the paper forms that are required under 40 CFR 122.41. Once a Permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to the EPA, the State of Idaho, or a tribe with approved TAS for the NPDES program. The Permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

E. Whole Effluent Toxicity Testing

Whole effluent toxicity (WET) is defined as "the aggregate toxic effect of an effluent measured directly by an aquatic toxicity test." Aquatic toxicity tests are laboratory experiments that measure the biological effect (e.g., survival, growth and reproduction) of effluents or receiving waters on aquatic organisms. In aquatic toxicity tests, groups of organisms of a particular species are held in test chambers and exposed to different concentrations of an aqueous test sample (e.g., reference toxicant, effluent, or receiving water). Observations are made at predetermined exposure periods. At the end of the test, the responses of test organisms are used to estimate the effects of the aqueous sample.

WET tests are used to measure the acute and/or chronic toxicity of an effluent on the receiving water. Acute toxicity tests are used to determine the concentration of the effluent that results in mortality within a group of test organisms, during a 24-, 48- or 96-hour exposure. A chronic toxicity test is defined as a short-term test in which sub-lethal effects, such as fertilization, growth or reproduction, are measured in addition to lethality (in some tests).

The Draft GWGP contains WET testing requirements for non-continuous, intermittent, and seasonal discharges as well as for continuous dischargers. The requirements specify testing frequency and methods, quality assurance responsibilities, and reporting protocols.

VII. Special Conditions

A. Quality Assurance Plan (QAP)

The federal regulation at 40 CFR 122.41(e) requires the Permittee to develop a Quality Assurance Plan (QAP) to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The Draft GWGP proposes that groundwater remediation discharge facilities complete and implement a QAP within 60 days of their authorization to discharge from the EPA.

The Permittee is required to follow specific sampling procedures [i.e., the EPA approved quality assurance, quality control, and chain-of-custody procedures described in Requirements for Quality Assurance Project Plans (EPA/QA/R-5)]; and Guidance for Quality Assurance Project Plans (EPA/QA/G-5) throughout all sample collection and analysis activities in order to ensure that quality data are collected.

The QAP must consist of standard operating procedures that the Permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. It must be available on-site for inspection at the request of EPA.

Federal regulations at 40 CFR §122.41(e) require Permittees to properly operate and maintain their facilities, including "adequate laboratory controls and appropriate quality assurance procedures." In order to implement this requirement, the draft GWGP Part IV.A, requires that the Permittee develop or update a QAP that ensures that the monitoring data submitted to EPA is complete, accurate, and representative of the environmental or effluent conditions.

B. Best Management Practices (BMP) Plan

Pursuant to Section 402(a)(1) of the Clean Water Act, development and implementation of a BMP Plan may be included as a condition in NPDES permits. Section 402(a)(1) authorizes EPA to include miscellaneous requirements in permits on a case-by-case basis, which are deemed necessary to carry out the provisions of the Act. BMPs, in addition to effluent limitations, are required to control or abate the discharge of pollutants in accordance with 40 CFR 122.44(k). The BMP Plan requirement has also been incorporated into this GWGP in accordance with EPA BMP guidance (EPA, 1993).

The Draft GWGP Part IV.B requires the development and implementation of a BMP Plan, which prevents or minimizes the generation and potential release of pollutants from the facility to the waters of the United States through best management practices. This includes, but is not limited to, material storage areas, site runoff, storm water, in-plant transfer, process and material handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage. The BMP Plan should incorporate elements of pollution prevention as set forth in the Pollution Prevention Act of 1990 (42 U.S.C. § 13101).

New Permittees under this GWGP must certify and notify EPA in writing that the BMP Plan has been developed and will be implemented on-site prior to any authorized discharge under this Permit. The certification must be signed in accordance with the Signatory Requirements in Part VII.G of this GWGP. Existing Permittees without a previous BMP Plan in place must develop a BMP Plan within 180 days of the effective date of this GWGP and certify to EPA and IDEQ in writing, in accordance with Part IV.B, the development and implementation of the BMP Plan. The BMP Plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants. The BMP Plan is an enforceable condition of the GWGP; therefore, a violation of the BMP Plan is a violation of the Permit.

VIII. Environmental Justice Considerations

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities." The EPA strives to enhance the ability of overburdened communities to participate fully and meaningfully in the permitting process for EPA-issued permits, including NPDES permits. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. As part of an agency-wide effort, the EPA Region 10 has considered implementing enhanced public involvement opportunities for EPA-issued permits where facilities' discharge to waters in overburdened communities. For more information, please visit http://www.epa.gov/compliance/ej/plan-ej/.

As part of the GWGP development process, the EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. The EPA used a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted. As part of the screening process, it was determined that the McCall Oil and Chemical Company groundwater remediation facility is located within an overburdened community in Nampa, Idaho.

The community around the facility is potentially overburdened because of measuring in the 80%ile for air toxics-respiratory, 97%ile for air toxics-neurological, 84%ile for traffic volume and toxicity, 94%ile for major direct water dischargers, 70%ile for minority residents and 97%ile for low income residents. In order to ensure that individuals living near the facility are able to participate meaningfully in the permit process, the EPA is announcing the availability of the draft GWGP and fact sheet, the time frame for the public comment period and EPA contact information in the City of Nampa Parks and Recreation Department Quarterly Activity Guide for April 2014 and the *Idaho Hispano* newspaper, in addition to the *Idaho Statesman* and the *Federal Register*.

Regardless of whether a facility/WWTP is located near a potentially overburdened community, the EPA encourages Permittees to review (and to consider adopting, where appropriate) "Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways to Engage Neighboring Communities" (see https://www.federalregister.gov/articles/2013/05/09/2013-10945/epa-activities-to-promote-environmental-justice-in-the-permit-application-process#p-104). Examples of promising practices include thinking ahead about community's characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, and other activities.

IX. Other Legal Requirements

A. Endangered Species Act [16 USC § 1531 et al.]

Section 7 of the Endangered Species Act (ESA) requires Federal agencies to consult with NOAA Fisheries (NMFS) and the U.S. Fish and Wildlife Service (USFWS) (the Services) if their actions have the potential to either beneficially or adversely affect any threatened or endangered species. The Draft GWGP does not authorize discharges from groundwater remediation facilities in Idaho to any receiving

waters where federally listed threatened, endangered, or candidate species, or designated or proposed critical habitat, pursuant to the ESA, are present, or to any receiving waters determined to be EFH under the Magnuson-Stevens Fishery Management and Conservation Act. ESA consultation will be required for individual situations where an applicant requests a waiver to discharge to an excluded receiving water. Therefore, the EPA has evaluated the Draft GWGP and has made the determination that issuance of the GWGP will have no effect on any threatened, endangered or candidate species, designated critical habitat, or essential fish habitat, and ESA consultation is not required. For more information on the waiver process, see Section III.H above.

B. National Environmental Policy Act (NEPA) [42 USC § 4321 et seq.] and Other Federal Requirements

Regulations at 40 CFR 122.49, list the federal laws that may apply to the issuance of permits i.e., ESA, National Historic Preservation Act, the Coastal Zone Act Reauthorization Amendments (CZARA), NEPA, and Executive Orders, among others. The NEPA compliance program requires analysis of information regarding potential impacts, development and analysis of options to avoid or minimize impacts; and development and analysis of measures to mitigate adverse impacts.

Due to the fact that groundwater remediation facilities do not have any EPA-promulgated ELGs or new source performance standards (NSPS) specific to their operation, EPA determined that no Environmental Assessments (EAs) or Environmental Impact Statements (EISs) are required under NEPA. Idaho is not located in the U.S. coastal zone, so CZARA does not apply either. In addition, the GWGP will not authorize the construction of any water resources facility or the impoundment of any water body or have any effect on historical property, and does exclude receiving waters with ESA species present or with Wild and Scenic River designations. Therefore, EPA has determined that the Fish and Wildlife Coordination Act, 16 USC § 661 et seq., and the Wild and Scenic Rivers Act, 16 USC § 470 et seq., also do not apply to the issuance of the GWGP.

C. State Certification

Section 401 of the CWA, 33 USC 1341, requires EPA to seek a certification from the state that the conditions of the Draft GWGP are stringent enough to comply with Idaho WQS, including the state antidegradation policy, before issuing the final permit. Federal regulations at 40 CFR 124.53 allow for the state to stipulate more stringent conditions in the permit, if the certification sites the CWA or state law upon which that condition is based.

The regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of state law. EPA previously requested that the IDEQ review the Draft GWGP and provide a draft certification pursuant to 40 CFR 124.53. The IDEQ provided EPA with their draft CWA § 401 certification for the draft GP on March 6, 2014. See Appendix E.

After the public comments have been evaluated and addressed, a preliminary final GWGP will be sent to the State to begin the final certification process. If the state authorizes different or additional conditions as part of the certification, the permit may be changed to reflect these conditions.

D. Essential Fish Habitat (EFH)

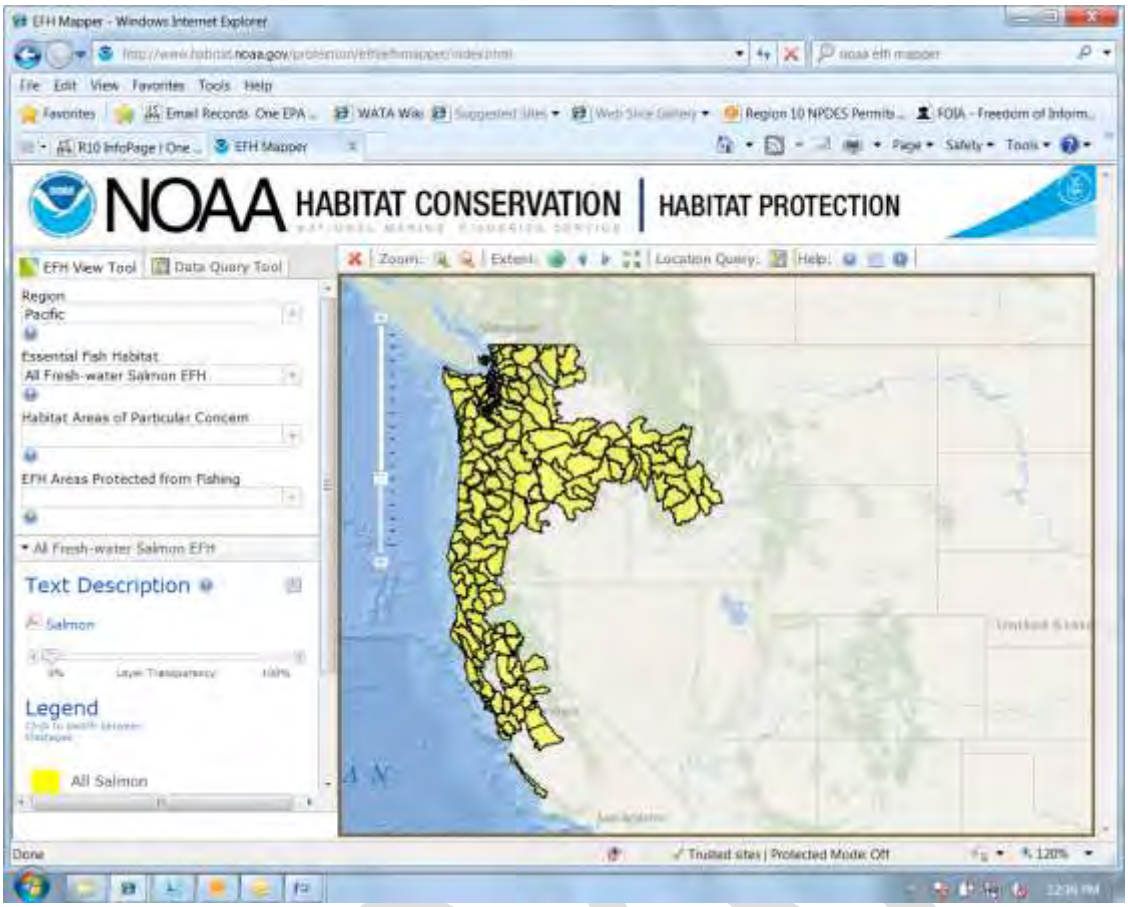

Figure 3. NOAA's EFH Mapper Showing Areas of Central Idaho Designated for Freshwater Salmon EFH

The Magnuson-Stevens Fishery Management and Conservation Act requires EPA to consult with NOAA-NMFS when a proposed discharge has the potential to adversely affect an Essential Fish Habitat (EFH). The EFH regulations define an adverse effect as "any impact which reduces quality and/or quantity of EFH... [and] may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions." NMFS may recommend measures for attachment to the federal action to protect EFH; however, such recommendations are advisory, and not prescriptive in nature.

EPA has tentatively determined that the issuance of this Draft GWGP has no effect on essential fish habitat. The Draft GWGP does not authorize discharges from groundwater remediation facilities in Idaho to any receiving waters where federally listed threatened, endangered, or candidate species, or designated or proposed critical habitat, determined to be EFH.

While a groundwater remediation discharge facility in Idaho may seek a waiver to discharge into excluded waters designated as EFH, the applicant must submit a written description of the nature and approximate timeframe of the proposed actions, an analysis of the effects of the actions on EFH and associated species and their life history stages, including cumulative effects, and EPA will make conclusions regarding the magnitude of such effects. If the BE results in a *not likely to adversely affect* determination, EPA will coordinate with NOAA to obtain concurrence with the submitted effects determination for EFH.

If, during the course of the process it is determined that the discharge *may adversely affect* any listed threatened, endangered, or candidate species; and/or *may adversely affect or* "extensive conservation requirements are necessary to protect" EFH, the facility may need to apply for an individual permit (Part II.C of the GWGP).

E. Permit Expiration
This general permit will expire five (5) years from the effective date of the Permit.

F. Presidential Oversight of Federal Regulations [Executive Order 12866]
The White House Office of Management and Budget (OMB) has exempted this action from the review requirements of Executive Order 12866 providing for presidential oversight of the regulatory process pursuant to Section 6 of that order. EPA has determined that this general permit is not a "significant regulatory action" under the terms of Executive Order 12866 and is therefore not subject to OMB review.

G. Economic Impact [Executive Order 12291]
EPA has reviewed the effect of Executive Order 12291 on this Draft GWGP and has determined that it is not a major rule under that order. This regulation was submitted previously to the OMB for review as required by Executive Order 12291. The OMB has exempted this action from the review requirements pursuant to section 8(b) of that Order.

H. Paperwork Reduction Act [44 USC § 3501 et seq.]
EPA has reviewed the requirements imposed on regulated facilities in the Draft GWGP under the Paperwork Reduction Act. The information collection requirements have been approved by OMB in submissions made for the NPDES permit program and the previous general NPDES permit for groundwater remediation facilities in Idaho. The information collection requirements of this permit were previously approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act, 44 USC 3501 et seq., and assigned OMB control numbers 2040-0086 and 2040-0110.

I. Standard Permit Provisions
Specific regulatory management requirements for NPDES permits are contained in 40 CFR 122.41. These conditions are included in the Draft GWGP in Parts V-VII as standard regulatory language that must be included in all NPDES permits. Since that language is a recitation of existing regulations, it is not open for comment and cannot be challenged in the context of this permitting action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

X. REFERENCES

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APPENDIX A. CATEGORIES OF FACILITIES AND ASSOCIATED PARAMETERS

See the Permit Tables for the details on the effluent limitations and monitoring requirements for the parameters

Note: If any contaminants of concern are present in detectable levels in the effluent, but not identified in these tables, the contaminants and their influent/effluent concentrations must be provided on the NOI for EPA and IDEQ to review.

Table 8. Category A-1: Petroleum Related Gasoline Only Cleanup Sites

See Permit Table 1 for more details.

Pollutants To Be Limited and Monitored
TSS
Temperature
pH
Flow
TPH
Benzene
Total BTEX
EDB
MTBE
Naphthalene
Lead
Iron

Table 9. Category A-2: Petroleum Related Fuel Oils (and Other Oils) Sites

Existing Facility to have these limits and monitoring requirements: PacifiCorp Idaho Falls Pole Yard, under NPDES No. IDG911004. See Permit Table 2 for more details.

Pollutants To Be Limited and Monitored
TSS
Temperature
pH
Flow
TPH
Benzene
BTEX
Naphthalene
Group I PAHs
Group II PAHs
Chromium III (trivalent)
Chromium VI (hexavalent)
Nickel
Zinc
Iron

Table 10. Category A-3: Petroleum Related Sites Mixed With Other Contaminants

See Permit Table 3 for more details.

Pollutants To Be Limited and Monitored
All COCs in Permit Table 3

Table 11. Category B-1: Non Petroleum Related VOC Only Sites

Existing Facilities to have these limits and monitoring requirements: Univar USA, Inc. Boise Town Square Mall, Westpark Shopping Center, and North Five Mile Road sites, under NPDES Nos. IDG911001 – IDG911003; and McCall Oil and Chemical Company, under NPDES No. IDG911005.

One additional Facility to have these limits and monitoring requirements: Boise State University (BSU), under NPDES No. IDG911006. See Permit Table 4 for more details. BSU received a mixing zone allowance from IDEQ for PCE and TCE, so the Maximum Limits Column in Table 4 applies to PCE and TCE discharges from BSU.

Parameter
TSS
Temperature
pH
Flow
TPH
Total BTEX
Carbon Tetrachloride
1,4 Dichlorobenzene (p-DCB)
1,2 Dichlorobenzene (o-DCB)
1,3 Dichlorobenzene (m-DCB)
1,1 Dichloroethane (DCA)
1,2 Dichloroethane (DCA)
1,1 Dichloroethylene (DCE)
cis-1,2 Dichloroethylene (DCE)
Dichloromethane (Methylene Chloride)
Tetrachloroethylene (PCE)
1,1,1 Trichloroethane (TCA)
1,1,2 Trichloroethane (TCA)
Trichloroethylene (TCE)
Vinyl Chloride (Chloroethene)
Pentachlorophenol
Bis (2-Ethylhexyl) Phthalate [Di-(ethylhexyl) Phthalate]
Iron

Table 12. Category B-2: Non Petroleum Related VOC Sites with Other Contaminants

See Permit Table 5 for more details.

Parameter
All COCs in Permit Table 5

Table 13. Category B-3: Non Petroleum Related Sites Containing Primarily Metals

See Permit Table 6 for more details.

Parameter
TSS
Temperature
pH
Flow
Antimony
Arsenic
Cadmium
Chromium III (trivalent)
Chromium VI (hexavalent)
Copper
Lead
Mercury
Methylmercury
Nickel
Selenium
Silver
Zinc
Iron
Cyanide
All Organic Parameters listed in Permit Table 6

APPENDIX B. POLLUTANT SPECIFIC ANALYSIS OF EFFLUENT LIMITATIONS AND RATIONALES

This Section provides a brief discussion of the individual pollutants or COCs that are included in the Draft GWGP, the proposed effluent limitations, and the rationale for these limits. A summary of the effluent limitations for each of the COCs, along with the bases for the limits is provided in Table 3.

Technology Based Effluent Limitations and Bases**"** and in Table 4. "Proposed Water Quality Based Effluent Limitations and Bases." The TBELs included in the GWGP are based on best professional judgment (BPJ) since there are no EPA promulgated ELGs applicable to groundwater remediation sites.

Numeric Criteria

1. Total Suspended Solids (TSS)

Solids are considered a "conventional pollutant" (as opposed to toxic). Suspended materials in water can cause turbidity, discoloration, interruption of light passage for aquatic growth, coating of fish gills, and sedimentation on stream bottoms interfering with egg laying and feeding. They can also act as carriers (through sorption) of toxic materials and cause interference with proper operation and maintenance of the typical treatment systems used for the pollutant control in this permit (e.g. air stripping, carbon adsorption, ion exchange, etc.). Groundwater, such as from extraction wells used in pump & treat systems, is typically low in TSS. However, TSS is often a problem in construction operations where soils and organic materials are being disturbed and mixed with groundwater or storm water.

EPA has determined that control of TSS in the waste streams from the dischargers covered by the general permit should be required, especially discharges from any sites involving construction or disruption of soils or sediments. A TSS limit is particularly important to maintaining good operation of subsequent treatment units in the system such as carbon adsorption (e.g., clogging of pores in the carbon granules), and to aid in the removal of contaminants which are adsorbed to soil particles.

Treatment technology for TSS is well understood, and a properly designed sedimentation and/or filtration system can readily remove TSS to low concentrations. Examples of established effluent limitations for TSS in other permits include: 1) the conventional technology treatment standards promulgated by EPA at 30 mg/L monthly average, and 45 mg/L weekly average for sewage treatment plants; 2) EPA's promulgated effluent guidelines, Part 436 for Mineral Mining, Industrial Sand category, sets TSS limitations of 25 mg/L average and 45 mg/L maximum; and, 3) EPA's proposed effluent guidelines, Part 440 for Ore Mining categories, sets TSS limitations of 20 mg/L average and 30 mg/L maximum. Considering this fairly consistent range of limits, and striving to be as protective of water quality as possible, the Draft GWGP retains the Maximum Daily limit of 30 mg/L from the 2007 GWGP and sets an Average Monthly limit of 21 mg/L using the 1991 EPA TSD methodology to translate from MDLs to AMLs.

Effluent Limits for TSS – For All Receiving Waters
AML = 21 mg/L
MDL = 30 mg/L

2. Total Residual Chlorine:

Chlorine is not a pollutant typically found at sites or other activities subject to this general permit. Although many toxic organic compounds contain chlorine molecules in their chemical makeup, chlorine compounds are sometimes introduced to the treatment process to control bacterial growth in the system.

Similarly, in certain situations such as at construction sites, incidental domestic sewage may be encountered, in which case disinfection may be required prior to discharge. Therefore, if chlorine has been added to the wastewater, the operator will need to de-chlorinate prior to discharge in order to meet the limits.

Addition of chlorine compounds for activities covered by the Draft GWGP can be tightly controlled for specific purposes. Facilities that submit information in an NOI indicating that chlorine compounds are used in the treatment system must de-chlorinate and monitor for total residual chlorine in the effluent. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Accordingly, 0.5 mg/L (500 µg/L) total residual chlorine can be adopted as a technology-based, BPJ effluent limit. That TBEL is the MDL for any facility granted a mixing zone for chlorine. However, in order to protect water quality and meet Idaho's WQS, this permit establishes a WQBEL for chlorine based on the Idaho water quality criteria: 19 µ/L for the protection of aquatic life from an acute exposure and 11 µg/L for the protection of aquatic life from a chronic exposure. The WQBELs calculated from these criteria, using the EPA TSD methodology, are 9 µg/L AML and 18 µg/L MDL.

Effluent Limits for Total Residual Chlorine- For All Receiving Waters
AML = 9 µg/L
MDL = 18 µg/L

Maximum Limit for Total Residual Chlorine if Granted a Mixing Zone
AML = 342 µg/L
MDL = 500 µg/L

The EPA has determined that the WQBELs for this parameter are not quantifiable using EPA-approved methods. Therefore, EPA will use the ML listed in the GWGP as the compliance evaluation level for this parameter. The Permittee will be in compliance with the effluent limitations if the average monthly and maximum daily concentrations are less than the ML listed in the Permit. Refer to Section V.E., Minimum Levels, of this fact sheet for more information.

3. pH

The State of Idaho WQS set surface water quality criteria for aquatic life use designations of the State's surface waters. The general criteria in Section 250 of the WQS (IDAPA 58.01.02.250) apply to all surface waters with aquatic life use designations (and all undesignated surface waters default to an aquatic life use). Section 250 states that Hydrogen Ion Concentration (pH) values must be within the range of 6.5-9.0 standard units at all times. Surface waters in Idaho are not to vary from this narrative criterion due to human activity. Therefore, the Draft GWGP sets a **pH limit not less than 6.5 and not more than 9.0 standard units.**

4. Total Petroleum Hydrocarbons (TPH)

The EPA has incorporated TPH as a parameter at many petroleum related site remediation projects nationwide. Historically, "oil & grease" was the primary petroleum related parameter limited in many individual NPDES permits, and "oil & grease" is listed as a common parameter in many of EPA's promulgated industrial effluent guidelines. However, the hydrocarbon fraction of the oil and grease parameter, or TPH, is the most appropriate parameter for setting effluent limits in the GWGP. A total oil and grease analysis would include other non-petroleum fats and greases in the result which would not be relevant to the activities covered by the Permit.

Similarly, due to the number of chemicals contained in refined petroleum products, measurement of all of the component chemicals is not practical, cost effective or needed for adequate attainment of water quality standards. An aggregate measurement of the hydrocarbon compounds serves as an indicator of overall relative pollutant concentration, and as an indicator for assessing water quality impacts.

Individual compounds of TPH, such as benzene which is also included in this permit, provide additional chemical specific controls on the discharge. Additionally, the hydrocarbon makeup in the environment changes after the product has been released due to volatilization, biodegradation, sorption, etc. which occurs over a period of many years in the groundwater. This is sometimes referred to as "weathering" of the petroleum release in which the various hydrocarbon fractions change through time.

In establishing the proposed effluent limit for TPH, EPA reviewed a number of sources including monitoring data being submitted pursuant to approved site remediation projects, other EPA and state issued general permits, and related effluent guidelines developed by EPA. In general, site remediation projects have consistently required an effluent limit maximum value for TPH of 5.0 mg/L. Review of monitoring information indicates that this limit is readily attainable with standard treatment technology and facilities discharging TPH rarely exceed 1.0 mg/L in the effluent results reported. Typically, the minimum laboratory reporting levels range from 0.2 - 0.5 mg/L. Therefore, EPA is proposing to retain the 2007 GWGP technology-based TPH Maximum Daily Limitation of 5.0 mg/L. And, using the TSD methodology, EPA calculated the applicable AML to be 3.4 mg/L.

Regarding monitoring of TPH, EPA recognizes that arguments can be made to not require TPH monitoring at gasoline only sites. However, given the variability of cleanup sites, the historic operations of typical gasoline stations which included general repairs, oil changes, supply of diesel fuel, and other considerations, the Draft GWGP retains the limitation and monitoring of TPH for all discharges authorized under this Permit.

Effluent Limits for TPH – For All Receiving Waters
AML = 3.4 mg/L
MDL = 5.0 mg/L

5. <u>Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)</u>

a.) Background

The four alkyl benzene volatile organic compounds (benzene, toluene, ethylbenzene, and the ortho, para, and meta xylenes) are common constituents of petroleum fuels. Gasoline may contain approximately 2% ethylbenzene, 5% benzene, and 11-12% toluene and xylenes depending on the formulation. The term BTEX, representing the sum of the concentrations of these four compounds, is commonly used by the petroleum industry in measuring the quality of fuels. This parameter has been adapted for use by EPA and state agencies to serve as a measure of effluent quality and an "indicator" parameter representing the wide variety of chemical compounds that may be found in petroleum products (see EPA's *Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks*, June 1989). In evaluating TBELs, the BTEX compounds have similar physical/chemical characteristics which can be used to assess the treatability of the contaminated water. Several important characteristics include the Henry's Law constant, the octanol/water partition coefficient (K_{ow}), the organic carbon partition coefficient (K_{oc}), and the chemical's solubility in water.

Since air stripping and carbon adsorption are the most widely used treatment technologies for control of volatile, semi-volatile, or non-volatile organic compounds in water, the evaluation of the chemical characteristics of the organic compounds will allow for a subsequent evaluation of the potential ease of

their removal by these common treatment technologies. In general, the more soluble a substance is in water the more difficult it is to remove by air stripping and carbon treatment. Additionally, the lower the Henry's law constant, the harder the compound is to remove by air stripping alone. Potential for carbon treatment (or natural soil attenuation) can be evaluated by using the partition coefficients (Kow and Koc) which provide an indication of the tendency of organic compounds to "sorb" onto soil or carbon particles (e.g. carbon adsorption). Lower Kow and Koc values (e.g., less than 100) indicate less efficient sorption. Rather than attempt to establish effluent limits for every compound found in a petroleum release, the selection of those compounds that would be most difficult to remove to low levels, coupled with an evaluation of the degree of toxicity of the compound, provides an adequate indicator of the potential removal of the other compounds in the contaminated water being treated with the common technologies mentioned here. Benzene has commonly been selected as a primary indicator of effluent quality for these reasons. EPA's June 1989 *Model NPDES Permit for Cleanup of Gasoline Released from Underground Storage Tanks* discusses the rationale for selection of Benzene and BTEX as appropriate parameters for discharge permits.

b.) Setting BTEX Limits

Most of the existing EPA and state issued permits for petroleum-contaminated groundwater remediation discharges limit BTEX as a secondary parameter. All of the BTEX compounds have closely related chemical characteristics to benzene. However, the composition of gasoline is highly variable and for some gasoline products, any one of the four BTEX compounds could be the dominant constituent. Therefore, regulating the total of the four, rather than individually, provides a useful secondary indicator for control of water discharges containing volatile petroleum contaminants.

EPA's June 1989 *Model NPDES Permit* mentioned above, recommends a total BTEX limit of 100 ug/L. This limit is based on the typical removal efficiency of 99.5% or better for BTEX using a commercially available air stripper unit. Based on EPA's 1989 *Model Permit* and the observed performance of control equipment at historical or existing cleanup sites, EPA is retaining the technology-based Maximum Daily limit of 100 µg/L from the previous GWGP and using the TSD methodology, EPA calculated the AML to be 68 µg/L.

Effluent Limits for Total BTEX –For All Receiving Waters
AML = 68 µg/L
MDL = 100 µg/l

c.) Setting Benzene Limits

Of the compounds in gasoline, benzene has one of the highest solubility's in water and one of the lowest Henry's law constants. Thus, when using air stripping as the form of groundwater treatment, benzene will be more difficult to remove. Benzene also has a low K_{oc} value. Consequently, it will be the most likely to "break through" when using carbon treatment, and appear in the effluent when the carbon's adsorptive capacity is becoming exhausted and needs replacement. Since benzene is an indicator compound, benzene breakthrough would also indicate that other hydrocarbons are no longer being sorbed out of the groundwater as well. Benzene is also one of the most toxic constituents (listed as a carcinogen in EPA's national primary drinking water regulations), and is the risk driver at most petroleum contaminated sites. Therefore, an effluent limitation on benzene is needed, and will ensure adequate control of the majority of the many other volatile gasoline constituents.
In evaluating a TBEL for benzene, EPA examined the current aquatic life and human health based criteria in the Idaho WQS established for this compound. The goal of this GWGP is to provide conservative protection for the receiving waters since the location of "new" discharges to be authorized in the future under this Permit and the receiving water quality of every facility to be authorized in the

future is not known at this time, while the GWGP is under development. For many organic compounds, the human health water quality criteria in the State of Idaho WQS are the most conservative. Criteria derived for human health protection are typically developed to achieve certain risk-based levels based on long-term (i.e., lifetime) exposure to the toxic pollutant.

The industrial effluent discharges covered by this GWGP will not typically be discharged directly to a drinking water supply, however since the limitations in this permit are not being developed on an individual or site-specific basis, the permit must be protective of all potential uses or exposure scenarios. It is possible that the receiving water of a discharge covered by this GWGP could be designated in the State of Idaho WQS as a domestic water supply (DWS). Since the technologies used to treat benzene, BTEX, and many of the other pollutants covered by this permit, can typically achieve minimum laboratory detection or reporting level concentrations, the most stringent criteria would apply when calculating effluent limitations.

The most commonly used TBEL for benzene is 5.0 µg/L, which is also the current Maximum Contaminant Level (MCL) set by the SDWA NPDWR limiting benzene in drinking water. The ID WQS set a criterion of 2.2 µg/L for the consumption of water + organisms (from waters with a DWS designation) and 51 µg/L for the consumption of organisms only (from waters without a DWS designation). However, as the MCL is a more stringent limit than the WQS for waters without a DWS designation, EPA is required to use the most stringent limit in the general permit. The MDL for waters with a DWS designation and the AML for waters without a DWS designation were calculated in accordance with the TSD.

Effluent Limits for Benzene – For Receiving Waters with a DWS (Water + Org) Designation
AML = 2.2 µg/L
MDL = 3.2 µg/L

Effluent Limits for Benzene – For Receiving Waters without a DWS Designation
AML = 3.4 µg/L
MDL = 5.0 µg/L

6. <u>Ethylene Dibromide (EDB) - (also 1,2-Dibromoethane)</u>

EDB is included as a COC in the GWGP due to the historic use of this compound as a plant fumigant (pesticide) and as an additive in leaded gasoline (as a lead scavenger, especially in aviation fuels). Due to its toxicity, most uses of EDB have been eliminated since the mid 1980's. However; the historic direct application of EDB and releases of gasoline to the environment have contaminated groundwater in Idaho. Additional sites requesting coverage in the future may also be discharging EDB. EDB has not been included to date as a priority pollutant for development of national water quality criteria under the CWA; however, MCLs have been established under the SDWA. The current MCL for EDB as well as the groundwater standard in Idaho is 0.05µg/L.

EDB is typically found at very low concentrations in contaminated groundwater. It is typically being treated with granular activated carbon (GAC) treatment systems, although it is somewhat more difficult to remove from water than benzene. Review of monitoring data indicates that an effluent limitation established at 0.05 µg/L can be achieved by current technology. Therefore, the Draft GWGP retains the MDL of 0.05µg/L for EDB from the previous Permit and using the 1991 EPA TSD, the AML was calculated to be 0.03 µg/L.

Effluent Limit for EDB – For All Receiving Waters
AML = 0.03 µg/L
MDL = 0.05 µg/L

7. Methyl-Tert-Butyl Ether (MTBE):

Many chemical compounds have been added to petroleum fuels to enhance their performance. Due to the phase-out of leaded gasoline in the early 1980's, several alcohols and ethers began to replace tetraethyl lead as an anti-knock and octane boosting additive. Once the 1990 Clean Air Act requirements for cleaner burning fuels took effect, requiring additional oxygen content, MTBE concentrations in gasoline increased to 11-15% by volume. Since 1992, higher concentrations of MTBE have been used in many automotive fuels across the country. As a result, MTBE, and several of the other gasoline oxygenate compounds, have been detected in significant concentrations in groundwater due to leaking tanks or other releases of petroleum fuels. Idaho has established a groundwater standard for MTBE, but has not done so for some of the lesser used fuel oxygenates such as ethyl tertiary-butyl ether, tert-butyl alcohol, or tertiary-amyl methyl ether. Consequently, only MTBE was considered.

The solubility, Henry's law, and K_{oc} values for these oxygenates indicate potential treatment effectiveness challenges. For example, MTBE is about 30 times more soluble than benzene and 10 times less volatile when moving from dissolved phase in water to a vapor phase (e.g. using air stripping treatment technology) due to the lower Henry's law constant. MTBE is also much less likely to adsorb to organic carbon due to a lower K_{oc} than benzene. In using air stripper technology, significantly more air capacity is required to strip MTBE from water. Using carbon treatment, additional carbon capacity is necessary and more frequent carbon filter replacements are required. Both of these factors increase the cost of operation and maintenance of treatment for MTBE. Therefore, the qualities which make benzene attractive as an indicator of treatment efficiency for the majority of the other constituents in fuels, do not necessarily apply to MTBE as well.

In order to establish the appropriate effluent limitations for MTBE, EPA evaluated both technology-based and water quality-based requirements. MTBE is not currently listed as a priority pollutant for water quality criteria promulgation by EPA, and as such, does not have either aquatic life or human health numeric criteria developed in the State of Idaho's WQS. The majority of work regarding oxygenates has been through the SDWA and Resource Conservation Recovery Act (RCRA) drinking water protection and underground storage tank programs, respectively, where the primary concern has been on preventing and remediating contamination of groundwater and minimizing or mitigating the human health impacts from drinking water obtained from groundwater wells.

EPA's drinking water program has not yet established MCLs for MTBE under the SDWA. However, EPA has issued lifetime health advisories for MTBE in drinking water based primarily on taste and odor thresholds, and these advisory concentrations are also considered protective of human health. An EPA advisory from 1997 establishes a concentration in the range of 20 - 40µg/L of MTBE in drinking water as a threshold value for taste and odor.
http://water.epa.gov/action/advisories/drinking/upload/2005_05_06_criteria_drinking_mtbe.pdf
Monitoring reports from gasoline remediation sites pursuant to approved site remediation projects demonstrate that using best available treatment (e.g. air stripping and/or carbon filtration) a limit of 20µg/L is feasible. Therefore, EPA is retaining the 2007 GWGP's MDL for MTBE at 30µg/L (the median of the EPA advisory threshold for taste and odor effects and for the protection of human health) and calculated the AML of 21 µg/L using the 1991 EPA TSD methodology.

Effluent Limit for MTBE – For All Receiving Waters

AML = 21 µg/L
MDL = 30 µg/L

8. Naphthalene

Naphthalene is a bicyclic aromatic hydrocarbon derived from coal tar or crude oil. It is also an insecticide that is used as a repellent. Naphthalene is a common constituent of petroleum; and is also used as an intermediate in the production of plastics, dyes, solvents, lubricants, and motor fuels. It is one of a number of polycyclic (or polynuclear) aromatic hydrocarbon (PAH) compounds (see further information in this section on PAHs) included as priority pollutants under the CWA. Naphthalene and other PAHs are released from incomplete combustion processes originating in industry, domestic sources including cigarette smoke and motor vehicle exhaust, as well as natural events such as forest fires.

Naphthalene is only slightly soluble in water (approximately 30 mg/l); however, it is highly soluble in benzene and other solvents. The 1989 EPA *Model Permit* for gasoline suggested that benzene would be an appropriate indicator of removal of naphthalene as well as the other BTEX compounds. However, naphthalene is also a significant component of fuel oils (several percent by volume), and is found as a contaminant at a number of older industrial sites, such as former coal gas plant facilities, and those often referred to as "urban fill" sites.

In reviewing data submitted pursuant to approved site remediation projects, naphthalene was noted in a wide variety of discharges. Therefore, EPA is including naphthalene as a stand-alone COC within the group of the other PAH compounds (see PAH compounds discussion below). EPA evaluated both TBELs and WQBELs for naphthalene in the Draft GWGP. However, in evaluating analytical data regarding naphthalene in water, it is important to note that this compound may be reported by both volatile petroleum hydrocarbon analysis and extractable petroleum hydrocarbon analysis since it falls within the dividing region between purgeable and extractible organics.

The chemical characteristics of naphthalene are similar enough to BTEX compounds such that naphthalene is expected to be removed to low concentrations (at or below laboratory reporting levels) by the standard treatment technologies. EPA has limited naphthalene as a parameter at most petroleum fuel cleanup sites, and at numerous other types of industrial sites. Monitoring reports indicate typical influent concentrations of naphthalene in the range of less than 10 to several thousand parts per billion in waters being treated. Effluent concentrations have typically been at the laboratory reporting levels using combinations of air stripping and/or carbon adsorption treatment.

Regarding human health effects, EPA has not published an MCL for naphthalene in drinking water; however, naphthalene has been identified using the EPA 2005 *Guidelines for Carcinogen Risk Assessment* Cancer Descriptor "I", meaning "inadequate information to assess carcinogenic potential". In the EPA 2012 Edition of the Drinking Water Standards and Health Advisories, EPA's recommended level for a lifetime exposure to naphthalene via drinking water is 100µg/L. Therefore, EPA retained the MDL (100 µg/L) from the 2007 GWGP, and calculated the AML of 68 µg/L using the 1991 TSD methodology. http://water.epa.gov/action/advisories/drinking/upload/dwstandards2012.pdf

Effluent Limit for Naphthalene –For All Receiving Waters
AML = 68 µg/L
MDL = 100 µg/l

9. Chlorinated Volatile Organic Compounds

A number of chlorinated volatile organic compounds (VOCs) have been commonly reported as contaminants in groundwater at many remediation and construction dewatering sites, including those in Idaho. VOCs are typically present in groundwater, or in surface water, as a result of releases from manufacturing and other industrial operations where these chemicals were used in the production of solvents or cleaners (e.g. paint thinners and removers, de-greasers, dry-cleaning agents, etc.). These compounds are also commonly found in household hazardous wastes. Mixtures of chlorinated VOCs may be present at remediation sites due either to the use or storage of these chemicals at a certain location, or due to the weathering and chemical breakdown of a parent compound after its release into the environment.

To select the most appropriate COCs to limit in the GWGP, EPA reviewed permit applications and monitoring reports pursuant to approved site remediation projects in order to determine which of the compounds were most prevalent. Many of these compounds have similar chemical characteristics which is important in evaluating potential treatment technologies. Based on prior monitoring reports, EPA expects that, in most instances, efficient control or removal of these COCs will also ensure removal of other compounds with similar chemical characteristics which are not included as COCs. However, as a precaution, applicants for coverage under the GWGP are required to identify all chemical compounds found, or believed to be present at their site(s), and include them in the NOI information to be submitted to EPA for evaluation. The Draft GWGP limits the following:

1. Carbon Tetrachloride
2. 1,4 (or p)-Dichlorobenzene (p-DCB);
3. 1,2 (or o)-Dichlorobenzene (o-DCB);
4. 1,3 (or m)-Dichlorobenzene (m-DCB)
5. 1,1-Dichloroethane (DCA);
6. 1,2-Dichloroethane (DCA);
7. 1,1-Dichloroethylene (DCE);
8. cis-1,2-Dichloroethylene (DCE);
9. Dichloromethane (DCM), or Methylene Chloride;
10. Tetrachloroethylene (PCE);
11. 1,1,1-Trichloroethane (TCA);
12. 1,1,2 Trichloroethane (TCA);
13. Trichloroethylene (TCE); and
14. Vinyl Chloride.

Available information indicates that with few exceptions, properly designed and operated treatment units including air stripping and/or activated carbon, can achieve effluent concentrations at laboratory reportable values (often referred to as “non-detect” in the lab reports). The EPA has included TBELs for the 14 chlorinated VOCs identified above in the Draft GWGP. The TBELs are from EPA ELGs, monitoring data, other GPs, standard operating practices, SDWA MCLs, criteria promulgated in the State of Idaho Ground Water Quality Rule [IDAPA 58.01.11], or published EPA Regional Screening Levels for Superfund Sites. EPA retained five (5) MDL TBELs from the 2007 GWGP. The TBELs are provided in Table 3, above. No mixing zones are available to achieve TBELs, so they must be met at the “end of the pipe”.

More stringent WQBELs were calculated for six (6) of the chlorinated VOCs: Carbon Tetrachloride, 1,2-Dichloroethane, PCE, 1,1,2-Trichloroethane, TCE, and Vinyl Chloride where there are promulgated Idaho WQS, in order to ensure that the discharge meets the standards. Mixing zones may be available to

the facility pending review by the EPA and IDEQ of the NOI information submitted. However, in no case may the final permit effluent limitations (AML/MDL) exceed the TBELs for a given COC.

Table 14. Limits for Chlorinated VOCs

Parameter	WQBEL (µg/L unless noted)		TBEL (µg/L unless noted)	
	AML	MDL	AML	MDL
Carbon Tetrachloride (DWS)[1]	0.23	0.34	--	--
Carbon Tetrachloride	1.6	2.3	3.4	5.0
p-DCB	--	--	51	75
o-DCB	--	--	411	600
m-DCB	--	--	411	600
1,1-DCA	--	--	1.6	2.4
1,2-DCA[1]	0.38 (DWS)	0.55 (DWS)	3.4	5.0
1,1 DCE	--	--	5.0	7.0
cis-1,2 DCE	--	--	48	70
Methylene Chloride	--	--	3.4	5.0
PCE (DWS)[1]	0.69	1.01	--	--
PCE	3.3	4.8	3.4	5.0
1,1,1 TCA			137	200
1,1,2 TCA[1]	0.59 (DWS)	0.86 (DWS)	3.4	5.0
TCE	2.5	3.7	3.4	5.0
Vinyl Chloride[1]	0.025	0.037	1.4	2.0

[1]The EPA has determined that the WQBELs for Carbon Tetrachloride, 1,2-DCA, PCE, 1,1,2-TCA, and Vinyl Chloride are not quantifiable using EPA-approved methods. The EPA will use the MLs as the compliance evaluation levels for these parameters. The Permittee will be in compliance with the limitations if the average monthly and maximum daily concentrations are less than the ML. Refer to Section V.E, Minimum Levels for more information.

10. <u>Pentachlorophenol (PCP)</u>

Phenolic compounds are widely used as chemical intermediates such as the manufacture of resins; and as disinfectants, antiseptics, and pesticides. Pentachlorophenol (PCP) has also been extensively used as a wood preservative. Releases to the environment may occur from the manufacturing use of products containing phenols; and from combustion sources, coal gas, and the natural decay of organic matter.

PCP is listed as an EPA priority pollutant, and has organoleptic (i.e., taste and odor) effects in water at low levels. While PCP is the only phenolic compound included in this Draft GWGP, if an applicant for coverage under this Permit is aware of other nitro or chlorinated phenols at their facility, those additional phenols should be identified in the NOI information submitted to EPA. As stated above,

EPA has evaluated the existing TBELs and the need for WQBELs for PCP. PCP is classified with Cancer Descriptor “L”, meaning “likely to be carcinogenic to humans” in EPA’s 2012 Edition of Drinking Water Standards and Health Advisories. The toxicity of PCP to aquatic life is also dependent Copper on the pH of the water receiving the pH discharge. The standard values published in EPA’s National Recommended Water Quality Criteria under Section 304(a) of the Clean Water Act are calculated at a pH of 7.8, and the State of Idaho’s water quality criteria for PCP factor pH into the calculations.

The State of Idaho's water quality criteria for PCP are based on protecting aquatic life from acute effects in freshwater at 20 µg/L and protecting aquatic life from chronic effects in freshwater at 13 µg/L. The State of Idaho water quality criteria for PCP based on protecting human health are 0.3 µg/l (for consumption of water and organisms) and 3.0 µg/l (for consumption of organisms only). The current EPA drinking water MCL and Idaho groundwater standard for PCP is 1.0 µg/L. The Draft GWGP includes a WQBEL for PCP if the receiving water is designated for DWS, based on Idaho's numeric human health criteria for the protection of surface water. For receiving waters that do not have a DWS designated use, the MCL is the TBEL, as it is more stringent than the corresponding WQBEL based on the WQS.

Effluent Limits for PCP – For Receiving Waters with a Drinking Water Supply (Water + Org) Designation
AML = 0.27 µg/L
MDL = 0.39 µg/L

Effluent Limits for PCP – For Receiving Waters without a Drinking Water Supply (Organism Only) Designation
AML = 0.68 µg/L
MDL = 1.0 µg/L

The EPA has determined that the WQBELs for PCP are not quantifiable using EPA-approved methods. The EPA will use the ML as the compliance evaluation level for this parameter. The Permittee will be in compliance with the limitations if the average monthly and maximum daily concentrations are less than the ML.

11. <u>Bis (2-Ethylhexyl) Phthalate</u>
There are many phthalate compounds which are produced and widely used as in rubber, plasticizers, resin solvents, wetting agents, and insect repellants among other uses. EPA has included a number of specific phthalate compounds on the CWA priority pollutant list including diethyl and dimethyl phthalate, butylbenzyl phthalate, and others which are not considered highly toxic to aquatic life or human health in water. One widely used phthalate compound, bis (2-ethylhexyl) phthalate is considerably more toxic and is included as a COC in this Draft Permit.

Bis (2-ethylhexyl) phthalate, also known as di (2-ethylhexyl) phthalate (or DEHP) is one of the most widely produced and used phthalate compounds. Primary use is as a plasticizer for polyvinyl chloride (PVC) and in other applications including insect repellants, cosmetics, soaps and detergents, synthetic rubber, and many other products. It is also in use as a replacement for PCBs as a dielectric fluid in transformers. EPA identified DEHP as a class B2 compound, or a "probable carcinogen with sufficient evidence in animals and inadequate or no evidence in humans" in the 2012 *Drinking Water Standards and Health Advisories* and has published CWA 304(a) National Recommended Water Quality Criteria that have been adopted into the IDEQ WQS.

EPA has evaluated both TBELs and WQBELs for DEHP. DEHP has a very low Henry's Law constant of approximately 1 x 10-7 which indicates that volatilization and removal by air stripping would not be efficient. However, the very high K_{oc} value indicates that it is not highly mobile in soils and will adsorb readily with GAC treatment.

The current IDEQ human health criteria for bis (2-ethylhexyl) phthalate are 1.2 µg/l for protection from the consumption of water plus organisms and 2.2 µg/l for protection from the consumption of organisms

only. The current MCL, as well as the Idaho groundwater standard, is 6.0 µg/l. The November 2013 EPA Region 9 Regional Screening Levels for Superfund Sites sets 4.8 µg/L as the screening value for DEHP in tap water. EPA proposes to use that value as the MDL TBEL in the event a mixing zone is granted as it is more stringent than the MCL. Calculated WQBELs for both categories of use designations were more stringent than the TBEL.

Effluent Limits for Bis (2-Ethylhexyl) Phthalate – For Receiving Waters with a Drinking Water Supply (Water + Org) Designation
AML = 1.2 µg/L
MDL = 1.8 µg/L

Effluent Limits for Bis (2-Ethylhexyl) Phthalate – For Receiving Waters without a Drinking Water Supply (Organism Only) Designation
AML = 2.2 µg/L
MDL = 3.2 µg/L

Maximum Limits for Bis (2-Ethylhexyl) Phthalate if Granted a Mixing Zone
AML = 3.3 µg/L
MDL = 4.8 µg/L

12. <u>Polycyclic Aromatic Hydrocarbons (PAHs)</u>
PAHs include a large group of organic compounds that have similar chemical structures and chemical characteristics. They are found in fossil fuels, oil, coal, wood, and natural gas; and are often associated with releases of petroleum products, resin coatings, dyes, pharmaceuticals, insecticides and many other products. PAHs are found at numerous contaminated wastes sites throughout Idaho and the U.S. where they tend to bioaccumulate in fish and shellfish. PAH compounds are also reported at many contaminated construction dewatering sites located in urban settings due to former industrial activity, local power generation, coal gas production, and the historic disposal of ash from combustion.

EPA has listed 16 PAH compounds as priority pollutants under the CWA, seven of which have been identified as probable carcinogens. Accordingly, the PAHs have been divided into two separate groups in the Draft GWGP:

Group I: Carcinogenic PAHs: a. Benzo (a) Anthracene, b. Benzo (a) Pyrene, c. Benzo (b) Fluoranthene, d. Benzo(k) Fluoranthene, e. Chrysene, f. Dibenzo (a,h) Anthracene, g. Indeno(1,2,3-cd) Pyrene

Group II: Non Carcinogenic PAHs: h. Acenaphthene, i. Acenaphthylene, j. Anthracene, k. Benzo(ghi)-Perylene, l. Fluoranthene, m. Fluorene, , n. Phenanthrene, o. Pyrene
The Group I compounds are mostly products of incomplete combustion of fossil fuels and, with the exception of Chrysene, are not produced commercially for use. The Group II compounds are more common at contaminated sites, and are found as significant components of fuels, coal tar products, and from their use in manufacturing other products.

From a technology standpoint, most of the PAH compounds are only slightly soluble in water and have high Koc values ranging from approximately 1×10^3 to 1×10^6 thus making them nearly immobile in soil and amenable to removal by carbon adsorption. All of the Group I and Group II PAH compounds have very low Henry's law constant values at the 10^{-4} to10^{-6} range. Therefore, air stripping alone would not be expected to be adequate for removal of these chemicals. A review of groundwater monitoring data from sites with high concentrations of PAHs in soil generally indicate low aqueous PAH

concentrations due to their low solubility and immobility when released. Nevertheless, PAH limitations and carbon treatment are found to be necessary due to the toxicity of the Group I compounds at very low concentrations, and the soil water mixing that occurs during construction.

The current Idaho water quality criteria for the Group I carcinogenic PAH compounds have very low calculated concentrations for the protection of human health. For the Group I PAHs, the State of Idaho human health criterion is 0.0038 µg/L for protection from the consumption of water and organisms and the criterion is 0.018 µg/L for protection from the consumption of organisms only. Water quality criteria for the protection of aquatic life have not been established. These human health criteria were the basis of the AMLs for receiving waters with and without a DWS designation, respectively. The MDLs were calculated pursuant to the 1991 EPA TSD.

The maximum value that can be discharged corresponds with the ML for these COCs. The EPA has determined that the WQBELs for this parameter are not quantifiable using EPA-approved methods. Therefore, EPA will use the ML listed in the GWGP as the compliance evaluation level for this parameter. The Permittee will be in compliance with the effluent limitations if the average monthly and maximum daily concentrations are less than the ML listed in the Permit. Refer to Section V.E., Minimum Levels, of this fact sheet for more information.

Water quality criteria for the Group II PAHs vary considerably based on the current scientific information, however the target levels are typically orders of magnitude higher than the Group I compounds. Due to the widely varying nature of the discharges covered by this permit and the respective receiving water quality, the proposed effluent limits are based on a conservative approach. For the Group II PAH compounds, EPA is proposing a BPJ average monthly limit of 68 µg/L limit for the most common parameter, Naphthalene, with a maximum daily limit of 100µg/L (see discussion above). Additionally, an average monthly limit of 137µg/L and a maximum daily limit of 200µg/L are being proposed for the majority of the sum of the Group II PAH isomers due to the variability of the water quality criteria for each isomer, as well as the ability of adequate current treatment technology to consistently meet this maximum limit. 200 µg/L was the MDL for Group II PAHs in the previous GWGP and it is being retained.

Note that there are Idaho water quality criteria for Fluoranthene, Fluorene and Pyrene that EPA evaluated in the course of developing this Draft GWGP. The criteria have not yet been approved by EPA. And, for Fluorene and Pyrene, the water quality criteria resulted in WQBELs less stringent than the TBEL of 200 µg/L. For Fluoranthene; however, the water quality criterion for waters with a DWS designation resulted in WQBELs that were more stringent than the TBEL of 200 µg/L. The criterion is 130 µg/L for water + organisms, which resulted in the AML and MDL listed below.

Effluent Limitation for Group I PAHs - For Receiving Waters with a Drinking Water Supply (Water + Org) Designation
AML = 0.0038 µg/L
MDL = 0.0055 µg/L

Effluent Limitation for Group I PAHs - For Receiving Waters without a Drinking Water Supply (Organism Only) Designation
AML = 0.018 µg/L
MDL = 0.026 µg/L

Effluent Limitations for Group II PAH Compounds (Technology Based):

Naphthalene AML = 68 µg/L
Naphthalene MDL = 100 µg/L
Rest of the Group II Isomers AML = 137 µg/L
Rest of the Group II Isomers MDL = 200 µg/L

Effluent Limitations for Fluoranthene – For Receiving Waters with a Drinking Water Supply (Water + Org) Designation
AML = 130 µg/L
MDL = 190 µg/L

The EPA has determined that the WQBELs for the PAHs are not quantifiable using EPA-approved methods. The EPA will use the ML as the compliance evaluation level for this parameter. The Permittee will be in compliance with the limitations if the average monthly and maximum daily concentrations are less than the ML. Refer to Section V.E, Minimum Levels and Table 5 above.

13. <u>Polychlorinated Biphenyls (PCBs)</u>
PCBs represent a group of chemical compounds originally produced for their properties as insulating dielectric fluids in capacitors and transformers. PCBs were also used as plasticizers in rubber and synthetics, adhesives, de-dusting compounds, inks, cutting oil, pesticides, and sealant compounds. Given their many uses, they are widely distributed in the environment through product use, leaks or spills from electrical equipment, as well as direct discharge from industries using PCBs.

Individual PCB congeners are categorized as Aroclors, and are identified by a four digit number. For example, in Aroclor 1254, the first two digits identify that the substance is a biphenyl and the second two digits represent the approximate weight percent of chlorine (the exception to this is Aroclor 1016 developed later in attempting to reduce the environmental threat of PCBs). Lower chlorinated Aroclors (1221, 1232, 1016, 1242, and 1248) are colorless mobile oils. Increasing chlorine content turns them into viscous liquids (1254) or sticky resin (1260 and 1262). At the high end (1268 and 1270) they are white powders. In the table of nationally recommended water quality criteria, EPA defines total PCBs for aquatic life water quality criteria as "the sum of all congener or all isomer or homolog or all Aroclor analyses". http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm

PCBs are only slightly soluble in water and generally have high K_{oc} values. Therefore, they are easily sorbed to soil and sediments, and are not very mobile in the environment. Since one of the characteristics of PCBs is their resistance to degradation, they tend to persist in the environment and bioaccumulate in living organisms. Due to their chemical characteristics, PCBs are not likely to be released to groundwater. However, treatment of the water is required for all cases regardless of whether the PCB is the only significant pollutant, or whether there are mixtures of other pollutants at the same site. The standard treatment technology currently used for discharges to surface water is carbon adsorption.

In evaluating the PCB effluent limitations for the Draft GWGP, EPA reviewed the current Idaho WQS which identify that the human health criteria are derived for the "sum of all congener, isomer, or Aroclor analyses", otherwise known as total PCBs. The current Idaho water quality criteria for the protection of aquatic life is 0.014µg/L (chronic); while human health criteria is 0.000064µg/L for both water and organisms and organisms only. The EPA drinking water MCL value, as well as the Idaho groundwater standard, is currently set at 0.5µg/L. Due to the need to meet WQS, as well as the toxicity, persistence and tendency for bioaccumulation in the environment, the WQBELs for total PCBs in the Draft GWGP are based on the Idaho human health criterion. However, the EPA has determined that the WQBELs for

this parameter are not quantifiable using EPA-approved methods. Therefore, EPA will use the ML listed in the GWGP as the compliance evaluation level for this parameter. The Permittee will be in compliance with the effluent limitations if the average monthly and maximum daily concentrations are less than the ML listed in the Permit. Refer to Section V.E., Minimum Levels, of this fact sheet for more information.

Effluent Limitations for Total PCBs – For All Receiving Waters
Average Monthly = 0.000064 µg/L
Maximum Daily = 0.000093 µg/L (9.344E-05)

Maximum Limitations for Total PCBs if Granted a Mixing Zone
Average Monthly = 0.3 µg/L
Maximum Daily = 0.5 µg/L

14. <u>Metals</u>

a.) Background - Many types of metals can be found in ground and surface water in Idaho, and their concentrations vary widely depending on the geology, soil conditions, and the types of activities that have occurred on the site. Metals such as cadmium, chromium, lead, mercury, nickel, and silver can build up to toxic concentrations through industrial contamination. Many of these metals have been found in groundwater at remediation and construction dewatering sites in the region, particularly in areas with histories of urban, industrial, or mining activity. Other metals, such as arsenic and iron, frequently build up by leaching out of naturally occurring deposits under reducing conditions in surrounding bedrock or soils, or can be deposited as air fallout from smelting operations.

Human exposure to metals can lead to a variety of health problems. Severe effects include reduced growth, cancer, organ damage, nervous system damage, and in extreme cases, death. Exposure to some metals, such as mercury and lead, may also cause development of auto-immunity, in which a person's immune system attacks its own cells. This can lead to joint diseases such as rheumatoid arthritis, and diseases of the kidneys, circulatory system, and nervous system. The metals linked most often to human poisoning are lead, mercury, arsenic and cadmium. Other metals, including copper, zinc, and chromium, are actually required by the human body in small amounts, but can also be toxic in larger doses.

Metals can be toxic to marine and freshwater organisms, as well as contaminating other plant and animal species. Aquatic organisms are often more sensitive than humans to metals dissolved in water. Ultimately, metals can become concentrated in the human food chain, or in other organisms at higher tropic levels.

b.) COCs - To select the most appropriate COCs to include in the GWGP, EPA reviewed a number of existing NPDES permits, as well as applications and monitoring reports submitted pursuant to approved site remediation projects, and determined which metals were most prevalent. Thirteen (13) metals are included as COCs in the GWGP:

Antimony, Arsenic, Cadmium, Chromium (III), Chromium (VI), Copper, Lead, Mercury, Methylmercury, Nickel, Selenium, Silver, and Zinc

However, not all of EPA's priority pollutant metals were selected for this permit. EPA did not select: **beryllium, thallium, manganese,** and **barium**. The most significant reasons for not establishing an

effluent limitation for a particular metal included the infrequency in which it has been reported at sites, lower toxicity, and the probable removal of the contaminant along with other included chemicals by standard technology.

c.) Limits - To establish appropriate effluent limitations for these selected metals, EPA evaluated both the TBELs and WQBELs. This included information contained in monitoring reports from site remediation projects, available on EPA and other internet sites, and the water quality and cleanup standards published by EPA and the State of Idaho. The available information indicates that, with few exceptions, properly designed and operated treatment units, including: ion exchange, gravity settling, carbon adsorption, and chemical sequestration, can routinely achieve the removal of metals from groundwater.

However, many metals are toxic to aquatic organisms and Idaho has promulgated criteria in their WQS. Therefore, for most of the metals, the Draft GWGP sets WQBELs based on the 1991 EPA TSD methodology of calculating limits from the limiting long term average (LTA) of either the acute or chronic aquatic life water quality criterion. For arsenic in particular, the human health criteria were more stringent than the aquatic life criteria, at 10 µg/L. 10µg/L is also the EPA MCL for arsenic, so it is included in the Draft GWGP as the MDL. The AML for arsenic was calculated in accordance with the TSD.

d.) Consideration of Hardness – The limitations proposed in the Draft GWGP are calculated in a manner that accounts for the hardness of water. The Idaho WQS have set numeric criteria expressed at a default hardness (H) value of 100 mg/L as calcium carbonate ($CaCO_3$) in the receiving water (found in IDAPA 58.01.02.210.01). However, the Idaho WQS promulgate a minimum hardness value of 25 mg/L $CaCO_3$; except for cadmium, where the minimum hardness is set at 10 mg/L $CaCO_3$ [IDAPA.58.01.02.210.03c.i]. For the hardness dependent metals limited by the GWGP, EPA selected the minimum in the Idaho WQS to be used in the criteria and effluent limitations calculations. As this is a General Permit, and EPA does not know at this time all of the potential Permittees and receiving waters to be covered, EPA drafted the GWGP to be as conservative as possible and calculated the metals criteria and the effluent limitations proposed in the Draft GWGP using the minimum hardness values as stated in the WQS.

After performing the appropriate hardness calculations, the effluent limitations for metals included in the Draft GWGP are expressed in a total recoverable (TR) metal basis, using the appropriate conversion factors in the equations. 40 CFR 122.45(c) requires that NPDES permit limits be expressed on a total recoverable basis whereas state water quality criteria are typically expressed on a dissolved basis, as that is the bioavailable portion of the metal more suited for toxicity testing of aquatic life. Numeric metals criteria must be translated to TR concentrations using the element specific conversion factors (CF) from state WQS. Accordingly, the effluent limitations for metals in this GWGP are determined by setting the TR metal concentration = (Dissolved concentration)/ (CF). See Table 15, below, for the equations used in calculating the applicable water quality criteria for hardness dependent metals, based on Idaho WQS, using the minimum hardness values and calculating the acute and chronic conversion factors.

Table 15. Equations for Calculating Criteria for Hardness Dependent Metals

Equations for Calcualting Criteria for Hardness Dependent Metals	
Acute	CMC=WER exp{mA[ln(hardness)]+bA} X Acute Conversion Factor. (5-3-03)
Chronic	CCC=WER exp{mc[ln(hardness)]+bc} X Chronic Conversion Factor.

ACUTE TABLE

Parameter	Hardness (mg/L)	ln hardness	=mA*ln hardness	=(mA*ln hardness)+bA	Acute CF	Calculated Criteria Value (µg/L)	Criteria from ID WQS
Cadmium	10	2.30	1.93	-1.63	1.00	0.20	1.3
Chromium (III)	25	3.22	2.64	6.36	0.32	183.07	570
Copper - Boise River segment SW-5, IDAPA 58.0102.278	25	3.22	3.03	1.57	0.96	11.88	17
Copper - All Other Waters	25	3.22	3.03	1.57	0.96	4.61	
Lead - Boise River Segment SW-5, IDAPA 58.0102.278	25	3.22	4.10	2.64	1.00	28.65	65
Lead - All Other Waters	25	3.22	4.10	2.64	1.00	13.98	
Nickel	25	3.22	2.72	4.98	1.00	144.92	470
Silver	25	3.22	5.54	-0.98	0.85	0.32	3.4
Zinc	25	3.22	2.73	3.61	0.98	36.20	120

CHRONIC TABLE

Parameter	Hardness (mg/L)	ln hardness	=mc*ln hardness	=(mc*ln hardness)+bc	Chronic CF	Calculated Criteria Value (µg/L)	Criteria from ID WQS
Cadmium	10	2.30	1.44	-1.91	1.00	0.15	0.6
Chromium (III)	25	3.22	2.64	3.32	0.86	23.81	74
Copper - Boise River Segment SW-5, IDAPA 58.0102.278	25	3.22	2.75	1.29	0.96	8.95	11
Copper - All Other Waters	25	3.22	2.75		0.96	3.47	
Lead - Boise River Segment SW-5, IDAPA 58.0102.278	25	3.22	4.10	-0.61	1.00	1.12	2.5
Lead - All Other Waters	25	3.22	4.10		1.00	0.54	
Nickel	25	3.22	2.72	2.78	1.00	16.10	52
Silver	25	3.22	c	c	c	c	c
Zinc	25	3.22	2.73	3.61	0.99	36.50	120

Water Quality Criteria from IDEQ WQS

Metal	mA	bA	mc	bc	Acute CF	Chronic CF	Water Effect Ratio (WER)
Cadmium	0.837	-3.560	0.625	-3.344	1.000	1.000	1.000
Chrom III	0.819	3.726	0.819	0.685	0.316	0.860	1.000
Copper - Boise River Segment SW-5, IDAPA 58.0102.278	0.942	-1.464	0.855	-1.465	0.960	0.960	2.578
Copper - All Other Waters	0.942	-1.464	0.855	-1.465	0.960	0.960	1.000
Lead - Boise River Segment SW-5, IDAPA 58.0102.278	1.273	-1.460	1.273	-4.705	1.000	1.000	2.049
Lead - All Other Waters	1.273	-1.460	1.273	-4.705	1.000	1.000	1.000
Nickel	0.846	2.255	0.846	0.058	0.998	0.997	1.000
Silver	1.720	-6.520	c	c	0.850	c	1.000
Zinc	0.847	0.884	0.847	0.884	0.978	0.986	1.000

e.) Description and Rationale for Limits - Below is a brief description of and limit for each of the selected metals: -

Antimony - EPA has proposed the antimony limit in this general permit considering a number of factors including Idaho surface water quality criteria for human health protection and drinking water MCLs. The State of Idaho human health criteria for antimony are 5.6 µg/L (water and organisms) and 640 µg/L (organism only). The calculated limits based on the human health criteria for water and organisms are an AML of 5.6 µg/L and an MDL of 8.2 µg/L. However, for receiving waters without a DWS, the limits are based on the EPA MCL of 6.0 µg/L, as that TBEL is more stringent than the WQBELs calculated based on Idaho's WQS for receiving waters without a DWS. Comparing the numbers, the MCL turned out to be more stringent that the calculated WQBEL, so the limits for all receiving waters are an AML of 4.0 µg/L and MDL of 6.0 µg/L based on the MCL.

Effluent Limits for Antimony – For All Receiving Waters
Average Monthly = 4.0 µg/L
Maximum Daily = 6.0 µg/L

Arsenic –EPA has included arsenic limits in the Draft GWGP considering a number of values, including the Idaho WQS and drinking water MCLs. The Idaho aquatic life criteria for arsenic are 340 µg/L (freshwater acute) and 150µg/L (freshwater chronic). The Idaho human health criteria for arsenic are set at 10 µg/L for both the water and organisms and the organisms only designations. This value corresponds with the drinking water MCL for arsenic. EPA retained the 2007 GWGP TBEL for arsenic in the Draft GWGP based on the drinking water MCL.

Effluent Limits for Arsenic – For All Receiving Waters
Average Monthly = 7 µg/L
Maximum Daily = 10 µg/L

Cadmium – The Idaho water quality criteria for cadmium calculated by EPA for the purposes of the Draft GWGP are 0.2 µg/L(freshwater acute criterion with a hardness of 10 mg/L $CaCO_3$ and WER of 1.000) and 0.15 µg/L (the freshwater chronic criterion with a hardness of 10 mg/L and WER of 1.000, See Table 15 above). The drinking water MCL and the Idaho target default cleanup level for cadmium are both 5.0 µg/L. EPA included effluent limits for cadmium in the Draft GWGP based on the aquatic life criteria calculated with a hardness of 10 mg/L and acute and chronic conversion factors of 1.00. These calculated criteria were used in deriving the proposed effluent limits using the EPA 1991 TSD methodology. The AML was calculated to be 0.1 µg/L and the MDL was calculated to be 0.2 µg/L. However, the maximum limit for facilities granted a mixing zone for cadmium is based on the MCL.

Effluent Limits for Cadmium—For All Receiving Waters
Average Monthly = 0.1 µg/L
Maximum Daily = 0.2 µg/L

Maximum Limits for Cadmium if Granted a Mixing Zone
Average Monthly = 3.4 µg/L
Maximum Daily = 5.0 µg/L

The EPA has determined that the WQBELs for this parameter are not quantifiable using EPA-approved methods. Therefore, EPA will use the ML listed in the GWGP as the compliance evaluation level for this parameter. The Permittee will be in compliance with the effluent limitations if the average monthly and maximum daily concentrations are less than the ML listed in the Permit. Refer to Section V.E., Minimum Levels, of this fact sheet for more information.

Chromium - EPA has included chromium limits in the Draft GWGP based on water quality criteria. The water quality aquatic life criteria for chromium III (trivalent) were calculated by EPA to be 183µg/L acute (using a hardness of 25 mg/L CaCO3) and 23.8µg/L chronic (using a hardness of 25 mg/L CaCO3 and WER of 1.000). For chromium VI (hexavalent), the Idaho water quality aquatic life criteria are set by the state at 16µg/L (freshwater acute) and 11µg/L (freshwater chronic), as this COC is not hardness-dependent.

While EPA currently does not have a national recommendation for human health criteria for chromium III, the drinking water MCL under the SDWA for total chromium is 100µg/L. The MCL was set as the maximum limit for those facilities requesting a mixing zone. The nationally recommended human health criteria for chromium VI are 1100µg/L acute and 50µg/L chronic. Idaho did not adopt these into their state WQS, however; and the state WQS provide a footnote to permit authorities to address chromium in NPDES permit actions using the narrative criteria for toxics in Section 200 of the state's WQS.

In the Draft GWGP the limits for chromium III and chromium VI are based on the aquatic life criteria stated above. Hexavalent chromium (Chromium VI) does not have to be calculated using hardness, or a conversion factor, as the dissolved concentration is set equal to the total concentration.

Effluent Limits for Chromium III -- For All Receiving Waters
Average Monthly = 22.7 µg/L
Maximum Daily = 45.5 µg/L

Effluent Limits for Chromium VI -- For All Receiving Waters
Average Monthly = 8 µg/L
Maximum Daily = 16 µg/L

Maximum Limits for Chromium III and/or Chromium VI if Granted a Mixing Zone
Average Monthly = 68.5 µg/L Total Chromium
Maximum Daily = 100 µg/L (0.1 mg/L) Total Chromium

Copper - EPA calculated the applicable water quality criteria for the protection of aquatic life using a hardness of 25 mg/L CaCO3 and applied the site specific water effects ratio (WER) values into the calculations, as per Idaho WQS regulations at IDAPA 58.01.02.278.02. This results in two different sets of criteria values for copper, and subsequently, two sets of effluent limitations. One set applies specifically to the Boise River, Segment SW-5, and the other set applies to the remainder of the receiving waters in the State of Idaho.

The copper aquatic life criteria calculated for the Boise River Segment SW-5, using the required WER of 2.578, hardness of 25, and the acute and chronic conversion factors, are 11.88µg/L acute and 8.95µg/L chronic. The copper aquatic life criteria calculated for the remainder of receiving waters in Idaho, using a WER of 1.000, hardness of 25 and the acute and chronic conversion factors, are 28.65µg/L acute and 3.47µg/L chronic. Those calculated criteria were used in deriving the proposed effluent limits in today's Draft GWGP, using the EPA 1991 TSD methodology. The SDWA treatment technology/action level for copper is 1.3µg/L, so EPA set that as the maximum limit for a facility granted a mixing zone for copper.

Effluent Limits for Copper (for Boise River SW-5)
Average Monthly = 6.17 µg/L
Maximum Daily = 12.4 µg/L

Effluent Limits for Copper (for All Other Receiving Waters)
Average Monthly = 2.4 µg/L
Maximum Daily = 4.8 µg/L

Maximum Limits for Copper if Granted a Mixing Zone
Average Monthly = 0.89 µg/L
Maximum Daily = 1.3 µg/L

Lead - EPA has included lead limits in the Draft GWGP after evaluating the Idaho water quality aquatic life criteria and the MCL for lead in drinking water. EPA calculated the water quality criteria for lead using the State of Idaho's minimum hardness of 25 mg/L CaCO3, the acute and chronic conversion factors as shown in Table 15 above, and the site specific water effects ratio (WER) value for lead into the calculation, as per Idaho WQS regulations at IDAPA 58.01.02.278.02. This results in two different

sets of aquatic life criteria values for lead, and subsequently, two sets of effluent limitations. One set applies specifically to the Boise River, Segment SW-5, and the other set applies to the remainder of the receiving waters in the State of Idaho.

The lead aquatic life criteria calculated for the Boise River Segment SW-5, using the required WER of 2.049, hardness of 25, and the acute and chronic conversion factors, is 28.65µg/L acute and 1.12µg/L chronic. The lead aquatic life criteria calculated for the remainder of receiving waters in Idaho, using a WER of 1.000, hardness of 25 and the acute and chronic conversion factors, are 13.98µg/L acute and 0.54µg/L chronic. Those calculated criteria were used in deriving the proposed effluent limits in today's Draft GWGP, using the EPA 1991 TSD methodology.

In addition, EPA evaluated the aquatic life criteria against the SDWA drinking water action level for lead, which is 15µg/L, and much higher than the limits derived from the aquatic life water quality criteria calculated for receiving waters in Idaho. Therefore, EPA is proposing effluent limits for lead based on the calculated aquatic life criteria, but the SDWA action level is the maximum limit for facilities receiving a mixing zone for lead.

Effluent Limits for Lead (for Boise River SW-5)
Average Monthly = 0.91 µg/L
Maximum Daily = 1.83 µg/L

Effluent Limits for Lead (for All Other Receiving Waters)
Average Monthly = 0.45 µg/L
Maximum Daily = 0.9 µg/L

Maximum Limits for Lead if Granted a Mixing Zone
Average Monthly = 10 µg/L
Maximum Daily = 15 µg/L

The EPA has determined that the WQBELs for this parameter are not quantifiable using EPA-approved methods. Therefore, EPA will use the ML listed in the GWGP as the compliance evaluation level for this parameter. The Permittee will be in compliance with the effluent limitations if the average monthly and maximum daily concentrations are less than the ML listed in the Permit. Refer to Section V.E., Minimum Levels, of this fact sheet for more information.

Mercury - EPA has included mercury limits in the Draft GWGP considering the EPA nationally recommended water quality criteria for mercury in the water column and the MCL. The nationally recommended and previously approved water quality aquatic life criteria for mercury in the State of Idaho are 2.1 µg/L acute and 0.012 µg/L chronic. The drinking water MCL for inorganic mercury is similar, at 2 µg/L. However, the aquatic life criteria were used in deriving proposed effluent limits using the EPA 1991 TSD methodology, and the MCL is set as the maximum limit for a facility granted a mixing zone for mercury.

Effluent Limits for Mercury – For All Receiving Waters
Average Monthly = 0.01 µg/L
Maximum Daily = 0.02 µg/L

Maximum Limits for Mercury if Granted a Mixing Zone
Average Monthly = 1.4 µg/L

Maximum Daily = 2.0 µg/L

Note that the EPA recommended analytical method for mercury, Method 1631, has an ML of 0.5 nanograms/L. Labs in Idaho should be using Method 1631 to analyze mercury and therefore, the Permittee should report levels in the DMR even if the level is below the limit listed here.

Methylmercury – Should any levels of mercury be detectable in the facility's effluent samples during monthly monitoring, the Permittee must develop and implement a Mercury Minimization Plan (MMP). The EPA's *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion* recommends that where there is a quantifiable discharge of mercury from a point source, and the concentration of methylmercury in fish tissue from the receiving water exceeds or is close to the criterion, the permitting authority should find that the discharge has the reasonable potential to cause or contribute to excursions of the state methylmercury fish tissue criterion. If there is no TMDL for mercury for the receiving water, and it is not feasible to translate the fish tissue criterion to a water column concentration, the EPA Guidance recommends a permit requirement to develop and implement an MMP, as well as effluent monitoring using a sufficiently sensitive analytical method in order to determine if the MMP is effective.

The State of Idaho has also published guidance for the implementation of its methylmercury fish tissue criterion, the Implementation Guidance for the Idaho Mercury Water Quality Criteria. According to the Idaho Guidance, a point source that has the reasonable potential to cause or contribute to an excursion above the fish tissue criterion or that has been assigned a WLA in a TMDL is a "significant source".

Consistent with the recommendations in the EPA Methylmercury Guidance and the Idaho Mercury Guidance, EPA proposes that any Permittee under this GWGP with detectable levels of mercury in their effluent must develop and implement an MMP and monitor effluent monthly for mercury using sufficiently sensitive analytical methods. See Attachment B of the Draft GWGP for more details on Methylmercury Requirements.

Nickel - EPA calculated water quality criteria for the protection of aquatic life using a hardness of 25 mg/L as CaCO3, acute and chronic conversion factors, and a WER of 1.000. The calculations resulted in an acute criterion for nickel set at 144.92µg/L and a chronic criterion for nickel of 16.10µg/L. See the calculations as shown above in Table 15. EPA has published nationally recommended human health criteria for nickel of 610µg/L (Water + Org) and 4600µg/L (Organisms Only), and the State of Idaho adopted those recommendations into the state WQS. Therefore, as the most conservative values, the aquatic life criteria were used in deriving the proposed effluent limits using the EPA 1991 TSD methodology.

Effluent Limits for Nickel- For All Receiving Waters
Average Monthly = 13.2 µg/L
Maximum Daily = 26.5 µg/L

Selenium -EPA based the proposed selenium effluent limitations in the Draft GWGP on the Idaho water quality criteria for the protection of aquatic life. EPA did not have to recalculate the criteria for selenium, as it is not a hardness dependent metal. The acute criterion for selenium is 20µg/L and the chronic criterion for selenium is 5µg/L. Idaho WQS set human health criteria for selenium at 170 µg/L acute and 4200 µg/L chronic. Therefore, as the most stringent, the aquatic life criteria were used in deriving the proposed effluent limits using the EPA 1991 TSD methodology. The SDWA MCL for

selenium is 50 µg/L, so it was set as the maximum limit for a facility receiving a mixing zone for selenium.

Effluent Limits for Selenium- For All Receiving Waters
Average Monthly = 4.1 µg/L
Maximum Daily = 8.2 µg/L

Maximum Limits for Selenium if Granted a Mixing Zone
Average Monthly = 34 µg/L
Maximum Daily = 50 µg/L

Silver - EPA calculated water quality criteria for the protection of aquatic life using a hardness of 25 mg/L as CaCO3, an acute conversion factor, and a WER of 1.000. The calculations resulted in an acute criterion for silver of 0.32 µg/L. There is no EPA nationally recommended chronic aquatic life criterion for silver, and Idaho did not promulgate its own chronic criterion. There is also no national EPA recommendation for human health criteria for silver, so the proposed effluent limit for silver in the Draft GWGP is based on the calculated acute criterion. See the calculations as shown above in Table 15. The aquatic life criteria were used in deriving the proposed effluent limits using the EPA 1991 TSD methodology. There is an ML for silver at 0.2 µg/L, which is just slightly higher than the calculated AML.

Effluent Limits for Silver- For All Receiving Waters
Average Monthly = 0.19 µg/L
Maximum Daily = 0.4 µg/L

Zinc - EPA calculated water quality criteria for the protection of aquatic life using a hardness of 25 mg/L as CaCO3, acute and chronic conversion factors, and a WER of 1.000. The calculations resulted in an acute criterion for zinc set at 36.2µg/L and a chronic criterion for zinc set at 36.5µg/L. See the calculations show above in Table 15. The human health criteria for zinc in the Idaho WQS are 7400µg/L (Water + Organisms) and 26000µg/L (Organisms Only). Therefore EPA used the aquatic life criteria in deriving the zinc limits using the EPA 1991 TSD methodology.

Effluent Limits for Zinc – For All Receiving Waters
Average Monthly = 18 µg/L
Maximum Daily = 37 µg/L

Iron - EPA reviewed many treatment system operations and monitoring reports which outlined some common treatment system operation and maintenance (O&M) problems which develop as a result of high levels of naturally occurring iron in groundwater. Ferrous iron (Fe+2) is the soluble reduced form, and it oxidizes to insoluble ferric hydroxide (Fe+3) upon mixing and exposure to air. As Fe+3, it can foul or clog treatment units, cause growth of iron bacteria in the units, discolor the effluent, or cause localized sediment deposits in storm drains or receiving waters.

Some operators add chemical sequestering agents specifically developed to keep the ferrous iron in solution throughout the treatment process and in the discharge to surface waters as well, to avoid the added expenses of pre-treatment and iron removal from the effluent. Since most of the discharges covered by the Draft GWGP could be from contaminated ground waters which may contain elevated iron concentrations, two issues affecting surface water quality should be addressed by this Draft GWGP: 1) the transfer of high iron content ground water to the surface water (e.g. system pass-thru); and, 2) the

impacts on the treatment efficiency of the system being used to control the primary chemicals of concern in the discharge. While EPA recognizes that iron compounds are generally not toxic in the environment, excessive amounts may cause or contribute to violations of the State of Idaho water quality standards for color, turbidity, solids, and odor, as well as cause fouling of treatment systems.

EPA has published a national recommendation for an iron freshwater chronic criterion set at 1,000µg/L and there is no current nationally recommended human health criterion for iron. In proposing a limit for The Draft GWGP, EPA has considered the fact that iron may be "naturally occurring" and that treatment systems are designed primarily for control of more toxic pollutants caused by human activities. Furthermore, EPA has concluded that the iron limit in the GWGP must, at a minimum, provide for the proper operation and maintenance of the kinds of pollution control systems that are anticipated by the groundwater remediation activities covered by the permit.

Based on the information available, EPA is retaining the MDL from the previous GWGP, based on the national recommendation for aquatic life protection of 1,000µg/L (1 mg/L). The AML was calculated in accordance with the 1991 EPA TSD.

Effluent Limits for Iron – For All Receiving Waters
Average Monthly = 685 µg/L
Maximum Daily = 1,000 µg/L (1 mg/L)

Cyanide - Compounds containing the cyanide group (CN) are used in many industrial processes, and can be found in a variety of effluents such as those from steel, petroleum, plastics, synthetic fibers, mining, metal plating, and chemical industries. Cyanide occurs in water in many forms, including: hydrocyanic acid (HCN), the cyanide ion (CN-), simple cyanides, metallo-cyanide complexes, and as organic compounds. "Free cyanide" is defined as the sum of the cyanide present as HCN and CN-. The relative concentrations of these forms depend mainly on pH and temperature.

Both HCN and CN- are toxic to aquatic life. However, the vast majority of free cyanide usually exists as the more toxic HCN. Since CN- readily converts to HCN at pH values that commonly exist in surface waters, EPA's nationally recommended cyanide criteria are stated in terms of free cyanide expressed as CN-. Free cyanide is a more reliable index of toxicity to aquatic life than total cyanide because total cyanides can include nitriles (organic cyanides) and relatively stable metallo-cyanide complexes. EPA included cyanide limits in the Draft GWGP considering both Idaho water quality aquatic life and human health criteria. The Idaho water quality cyanide criteria for aquatic life are set at 22 µg/L acute and 5.2 µg/L chronic. The human health criteria are 140 µg/L for both the Water + Organisms and the Organisms Only designations. EPA used the aquatic life criteria in deriving the proposed effluent limitations using the EPA 1991 TSD methodology. The SDWA MCL for cyanide is 0.2 mg/L or 200 µg/L and the ML for cyanide is 10 µg/L.

Effluent Limits for Cyanide - For All Receiving Waters
Average Monthly = 4.3 µg/L
Maximum Daily = 8.5 µg/L

The EPA has determined that the WQBELs for this parameter are not quantifiable using EPA-approved methods. Therefore, EPA will use the ML listed in the GWGP as the compliance evaluation level for this parameter. The Permittee will be in compliance with the effluent limitations if the average monthly and maximum daily concentrations are less than the ML listed in the Permit. Refer to Section V.E., Minimum Levels, of this fact sheet for more information.

Narrative Criteria

The Idaho WQS specify certain narrative criteria that apply to all surface waters of the state at IDAPA 58.01.02.200, and narrative criteria that apply for all waters with aquatic life use designations (essentially all surface waters of the state) at IDAPA 58.01.02.250.These general surface water narrative criteria have been incorporated, if applicable, into the Draft GWGP:

1. **Hazardous Materials:** Surface waters of the state shall be free from hazardous materials in concentrations that impact public health or designated beneficial uses [IDAPA 58.01.02.200.01]
2. **Toxic Substances:** Surface waters of the state shall be free from toxic substances in concentrations that impair designated beneficial uses [IDAPA 58.01.02.200.02]
3. **Deleterious Materials:** Surface waters of the state shall be free from deleterious materials in concentrations that impair designated beneficial uses [IDAPA 58.01.02.200.03]
4. **Floating, Suspended, or Submerged Matter:** Surface waters of the state shall be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses [IDAPA 58.01.02.200.05]
5. **Excess Nutrients:** Surface water of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses [IDAPA 58.01.02.200.06]
6. **Oxygen-Demanding Materials:** Surface waters of the state shall be free from oxygen-demanding materials in concentrations that would result in an anaerobic water condition [IDAPA 58.01.02.200.07]
7. **Sediment:** Sediment shall not exceed quantities specified in Sections 250 and 252, or in quantities which impair designated beneficial uses. [IDAPA 58.01.02.200.08]
8. **pH:** The pH of an effluent discharge is an indicator of the relative acidity or alkalinity of the discharge. The pH criterion in Idaho is set as a range within 6.5-9.0 standard units (s.u.). Therefore, all facilities covered under this general permit must discharge effluent at a pH within the set range (IDAPA 58.01.02.250.01.a).
9. **Temperature:** The temperature criteria in Idaho are set at IDAPA 58.01.02.250.2b for aquatic life use designations. And, as stated above, in accordance with IDAPA.58.01.02.101, all non-designated surface waters are also to be protected for cold water biota. Cold water temperatures are set at 22°C or less, with a maximum daily average of no greater than 19°C. Effluent limits of 9°C for salmonid spawning [IDAPA 58.01.02.250.02.(f)(ii)] or 10°C for bull trout [40 CFR 131.33] may apply to those receiving waters further designated for salmonid spawning or bull trout uses. Designated uses for surface waters in Idaho can be found in Sections 110-160 of the Idaho WQS (IDAPA 58.01.02).

APPENDIX C. FACILITIES DETERMINED TO BE ELIGIBLE FOR COVERAGE UNDER THE GWGP

Facility Name	Boise Towne Square Mall
Initial Date of Coverage	December 21, 2007
Current Status	Administratively extended coverage under NPDES Permit No. ID-G91-0001 on February 7, 2012
Owner	Univar USA, Inc.
Operator	Univar USA, Inc.
Facility Location	City of Boise 43° 36' 19.46" N -116° 16' 42.76" W
Outfall Location	43° 36' 46.91 N -116° 17' 29.97" W
Treatment System Employed	Two wells extract the groundwater and pump it to granular activated carbon (GAC) filters and a resin treatment system for precipitating out the trichloroethylene (TCE) by adsorption. The TCE collected from the resin tanks is heated in the steam regeneration system, the steam is collected and distilled, and the collected TCE is shipped off-site.
Effluent Flow Design	200 gpm or 288,000 gpd
Receiving Water	Finch Lateral/Boise River via the City of Boise storm drain system
Discharge	Continuous
Pollutants Identified	PCE, TCE, 1,1-DCE, cis-1,2 DCE, vinyl chloride
Site History	Univar operated a chemical distribution facility from approximately 1973 -1983 at what is now the Boise Town Square Mall. No repackaging of chemicals occurred except for PCE. The PCE was received in bulk, stored in a 6000 gallon above ground tank, repackaged into smaller containers, or loaded for distribution. Spills occurred over time, and Univar began a remedial investigation in the 1990s. A remedial action plan and implementation plan were developed by Univar to address chemicals of concern, with approval by Idaho DEQ.
Permit Limits	Table 4 of Draft Permit. VOC Only Category
Permit Compliance History	This facility had one quarterly violation of the 1,1-DCE limit (Q3 2010 at 1.0 µg/L) and three quarterly violations of the PCE limit (Q4 2009 at 4.1 µg/L; Q3 2010 at 1.0 µg/L; and Q1 2011 at 8.0 µg/L). The facility was in compliance with the permit limits for all other parameters and all other quarters during the permit term.

Facility Name	Westpark Shopping Center
Initial Date of Coverage	December 21, 2007
Current Status	Administratively extended coverage under Permit No. ID-G91-0002 on February 7, 2012
Owner	Univar USA, Inc.
Operator	Univar USA, Inc.
Facility Location	City of Boise 43° 36' 35.48" N -116° 17' 14" W approximately 3000 feet downgradient of the Boise Town Square Mall system
Outfall Location	43° 36' 46.91 N -116° 17' 29.97" W
Treatment System Employed	Air stripper tower. One well pumps groundwater to the system.
Effluent Flow Design	200 gpm or 280,000 gpd
Receiving Water	Finch Lateral/Boise River via the City of Boise storm drain system
Discharge	Continuous
Pollutants Identified	PCE, TCE, 1,1-DCE, cis-1,2 DCE, vinyl chloride
Site History	See description under Boise Towne Square Mall
Permit Limits	Table 4 of Draft Permit. VOC Only Category.
Permit Compliance History	This facility had one quarterly violation of the 1,1-DCE limit (Q3 2010 at 1.0 µg/L) and one quarterly violation of the PCE limit (Q4 2008 at 4.0 µg/L). The facility was in compliance with the permit limits for all other parameters and all other quarters during the permit term.

Facility Name	North Five Mile Road
Initial Date of Coverage	December 21, 2007
Current Status	Administratively extended coverage under Permit No. ID-G91-0003 on February 7, 2012
Owner	Univar USA, Inc.
Operator	Univar USA, Inc.
Facility Location	City of Boise 43° 37' 16.81" N -116° 18' 55.02" W , at the front end of the PCE groundwater plume
Outfall Location	43° 36' 46.91 N -116° 17' 29.97" W
Treatment System Employed	Resin treatment system. Two wells pump groundwater to the treatment system.
Effluent Flow Design	100-150 gpm or 144,000-216,000 gpd
Receiving Water	Finch Lateral/Boise River via the City of Boise storm drain system
Discharge	Continuous
Pollutants Identified	PCE, TCE, 1,1-DCE, cis-1,2 DCE, vinyl chloride
Site History	See description under Boise Towne Square Mall
Permit Limits	Table 4 of Draft Permit VOC Only Category.
Permit Compliance History	This facility had one quarterly violation of the 1,1-DCE limit (Q3 2010 at 1.0 µg/L) and one quarterly violation of the PCE limit (Q3 2009 at 1.0 µg/L). The facility was in compliance with the permit limits for all other parameters and all other quarters during the permit term.

Facility Name	Idaho Falls Pole Yard
Initial Date of Coverage	April 30, 2008. EPA authorized the discharge after receiving USFWS concurrence and IDEQ CWA § 401 certification that WQS would be met.
Current Status	Administratively extended coverage under Permit No. ID-G91-0004 on December 1, 2011
Owner	PacifiCorp Inc.
Operator	PacifiCorp, Inc.
Facility Location	City of Idaho Falls, 43° 28' N and -112° 03' W
Outfall Location	Snake River at river mile 795
Treatment System Employed	Clarifier to remove suspended solids and two sets of GAC tanks to remove the organics. Eight wells pump groundwater to the treatment facility.
Effluent Flow Design	200 gpm or 288,000 gpd
Receiving Water	Snake River at river mile 795, Idaho Falls. The segment of the Snake River where the Idaho Falls Pole Yard is being discharged is protected by the State of Idaho WQS for cold water aquatic life, salmonid spawning, primary contact recreation, domestic water supply, and agricultural water supply. Therefore, the proposed effluent limits in the draft general permit that apply are the limits derived from the Water + Organism criteria and are more stringent, due to the DWS use designation on that segment of the Snake River. The facility was also discharging into a segment of the Snake River where federally listed threatened, endangered, or candidate species, or designated or proposed critical habitat were present. The facility identified the endangered Utah Valvata snail (*Valvata utahensis*) and the candidate species Western Yellow-billed cuckoo (*Coccyzus americanus*) as species existing in the vicinity of the discharge with their initial NOI for coverage. PacifiCorp submitted a Biological Evaluation to EPA on January 17, 2008 to assist with the Endangered Species Act Section 7 consultation with the U.S. Fish and Wildlife Service. EPA entered into consultation with the USFWS with the determination that the discharge from the PacifiCorp Idaho Falls Pole Yard facility may affect, but is not likely to adversely affect Utah valvata snails and will not affect the Yellow-billed cuckoo. On April 4, 2008, EPA received a letter from USFWS concurring with EPA's determination. On April 21, 2008, PacifiCorp received

	their individual CWA § 401 certification, and on April 30, 2008, PacifiCorp received EPA authorization to discharge under the GWGP. On August 25, 2010, the Utah Valvata snail was removed from the federal list of endangered and threatened species [75 FR 52272-52282]. The Western Yellow-Billed Cuckoo was proposed by the USFWS for the federal list of endangered species on October 17, 2013. The public comment period on the proposal was open until December 2, 2013. Moving forward, PacifiCorp will not need to request a waiver to discharge to an excluded area under the 2014 GWGP, as the de-listing of the Utah Valvata snail means that the segment of the Snake River to which the facility discharges is no longer excluded from GWGP coverage. Additionally, the 2008 BE submitted to EPA is still relevant, as the facility's discharge did not affect the Yellow-billed cuckoo before, and under the 2014 GWGP, the discharge must be even cleaner. Therefore, there will continue to be no effect on the Yellow-billed cuckoo from PacifiCorp's discharge, and no need for ESA consultation.
Discharge	Continuous
Pollutants Identified	Phenols, PAHs, Naphthalene
Site History	Historically, the PacifiCorp Idaho Falls Pole Treatment Yard was a facility for non-pressurized creosote treatment of wooden electrical power poles. The poles were dipped into a treatment vat containing creosote until take up of creosote was completed, then they were removed and suspended over the tank to allow excess creosote to run off. The poles were then transferred to other areas of the site where they were left to cure and were stored until needed. In July 1983, the company discovered that creosote was leaking from the pole yard. Since that time, all pole treating activities at the site have ceased. PacifiCorp now operates a hazardous waste management facility (HWMF) that remediates contaminated groundwater, the result of the creosote leak. When creosote contamination was discovered in the groundwater, PacifiCorp obtained a RCRA Part B permit to authorize the post-closure activities at the facility, including a corrective action plan for the removal and treatment of the creosote constituents in the groundwater.
Permit Limits	Table 2 of Draft Permit. Fuel Oils and Other Oils Category.
Permit Compliance History	This facility was in compliance with the permit limits for all parameters and all quarters during the permit term.

Facility Name	McCall Oil and Chemical Company
Initial Date of Coverage	August 20, 2008
Current Status	Administratively extended coverage under Permit No. ID-G91-0005 on February 7, 2012
Owner	McCall Oil
Operator	McCall Oil
Facility/Outfall Location	City of Nampa; Facility and Nampa Storm Drain located at 43 36' 6.04"N -116 32' 54.73"W; Mason Drain outfall is approximately 0.5 miles west of this point, discharges to Boise River approximately 8 miles NW of the facility
Treatment System Employed	The treatment facility is a network of four groundwater extraction wells that pump the contaminated groundwater to a stacked tray air stripping unit.
Effluent Flow Design	3-20 gpm or 4,320-28,800 gpd
Receiving Water	Mason Drain/Boise River via the City of Nampa storm drain system
Discharge	Continuous
Pollutants Identified	PCE and TCE, as well as 1,1-Dichloroethane (DCA) 1,2- DCE
Site History	In April 1990, the Former Great Western Chemical Company Facility (GWCC) documented a release of halogenated volatile organic (HVO) compounds at the site and was subsequently required to assess and remediate HVO impact to the

	environment. The GWCC decommissioned a network of chemical underground storage tanks (USTs) at the facility. Analysis of soil samples collected during the UST decommissioning suggested HVO compounds had been released. Observations made during the decommissioning indicated leaking pipe fittings likely caused the release(s) and an unknown quantity of product(s) had leaked from the UST system into the surrounding soils. Further assessment identified HVO impact to groundwater. According to the system operator, due to the success of the groundwater extraction wells and the treatment facility, the contaminated plume has decreased by about 50% since 1990.
Permit Limits	Table 4 of Draft Permit. VOCs Only Category.
Permit Compliance History	This facility had one TSS quarterly violation (Q2 2010 at 220 mg/L). The facility was in compliance with the permit limits for all other parameters and all other quarters during the permit term.

Facility Name	Boise State University
Status	Submitted application for individual NPDES permit for four of thirteen storm drain system outfalls located on the BSU campus on January 25, 2013. EPA proposes to authorize coverage for BSU with Permit No. ID-G91-1001 upon the effective date of the final 2014 GWGP.
Owner	Boise State University
Operator	Boise State University
Facility/Outfall Locations:	City of Boise, along the south bank of the Boise River. The primary campus is directly across from Julia Davis Park; covering approximately 175 acres.
Outfall A	43° 36' 25" N -116° 12' 25" W. Discharge determined to be 1 cfs on application form. Outfall A drains stormwater Basin A at the NW corner of the campus, covering approximately 10.41 acres. Groundwater is pumped from the basement of the Morrison Performing Arts Center seasonally between April and August.
Outfall D	43° 36' 17" N -116° 12' 10" W. Discharge determined to be 1 cfs on application form. Outfall D drains stormwater Basin D, the largest basin occupying the central core of the campus covering approximately 17.04 acres. Groundwater is pumped continuously year-round from the basement of the Student Union Building.
Outfall F	43° 36' 17" N -116° 12' W. Discharge not included on application form. Outfall F drains stormwater Basin F, approximately 0.61 acres, including the dormitories of Morrison and Driscoll Halls. Groundwater is pumped seasonally between April-August.
Outfall G	43° 36' 17" N -116° 11' 52" W. Discharge determined to be 1 cfs on application form. Outfall G drains stormwater Basin G, including the west half of the Taco Bell Arena, the Kinesiology building, paved stadium parking lot and other buildings. Groundwater is pumped during part of the year from the Kinesiology Building and Bronco Gym.
Treatment System Employed	None
Effluent Flow Ranges	Outfall D: 27-15,717 gpd (Avg. 6426 gpd)
	Outfall F: 5520-415,830 gpd (Avg 68,608 gpd)
	Outfall G: 3 -27,463 gpd (Avg. 2939 gpd)
Receiving Water	Boise River
Discharge	Seasonal Continuous for Outfalls A, F, and G (Typically between April and August). Continuous for Outfall D.
Pollutants Identified	PCE, TCE, cis-1,2 DCE
Site History	In 1999, it became apparent that there was a PCE/TCE-contaminated groundwater plume flowing from an off-site source (formerly called the Broadway Laundry and Dry Cleaners) towards the Boise River underneath the BSU campus. The campus runs pumps to keep the basements of a number of university buildings from flooding in the spring and summer months.
Permit Limits	Table 4 of Draft Permit VOC Only Category: With an IDEQ-approved Mixing Zone Allowance, the Maximum Limits Column in Table 4 applies to PCE and TCE.

APPENDIX D. EPA, IDEQ, AND TRIBAL OFFICE CONTACT INFORMATION

U.S. Environmental Protection Agency Region 10
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101
206/553-0523 or
1-800-424-4EPA (within Alaska, Idaho, Oregon and Washington)

Idaho Department of Environmental Quality
State Office
1410 North Hilton Street
Boise, Idaho 83706
208/373-0502

Idaho Department of Environmental Quality
Boise Regional Office
1445 North Orchard Street
Boise, Idaho 83706-2239
208/373-0550

Idaho Department of Environmental Quality
Twin Falls Regional Office
650 Addison Avenue West, Suite 110
Twin Falls, ID 83301
208/736-2190

Idaho Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way, #300
Pocatello, Idaho 83201
208/236-6160

Idaho Department of Environmental Quality
Lewiston Regional Office
1118 F Street
Lewiston, Idaho 83501
208/799-4370

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, Idaho 83814
208/769-1422

Idaho Department of Environmental Quality
Idaho Falls Regional Office
900 N. Skyline Drive
Idaho Falls, Idaho 83402
208/528-2650

Coeur d'Alene
Chairman
Coeur d'Alene Tribal Council
850 A. St. P.O. Box 408
Plummer, ID 83851-9703
208/686-1800

Kootenai
Chair
Kootenai Tribal Council
P.O. Box 1269
Bonners Ferry, ID 83805
208/267-3519

Nez Perce
Chair
Nez Perce Tribe of Idaho
P.O. Box 305
Lapwai, ID 83540
208/843-2253

Shoshone-Bannock
Chair
Shoshone-Bannock Tribes of Fort Hall
Business Council
P.O. Box 306
Fort Hall, ID 83203
208/478-3700

Shoshone-Paiute Tribes of the Duck Valley Indian Reservation
Chairman
Shoshone-Paiute Tribes of the Duck Valley Indian Reservation
P.O. Box 219
Owyhee, NV 89832
208/759-3100

APPENDIX E. IDEQ DRAFT CWA SECTION 401 CERTIFICATION

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

March 6, 2014

Michael J. Lidgard
NPDES Unit Manager
U.S. EPA Region 10
Attn: OWW-130
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Re: Draft §401 Water Quality Certification for Draft NPDES Permit for Groundwater Remediation Facilities in Idaho (IDG-911000)

Dear Mr. Lidgard,

Enclosed is the draft §401 water quality certification for the preliminary draft Groundwater Remediation General Permit (GWGP) for Idaho. Also included is the mixing zone analysis, authorization letter for Boise State University and the CORMIX modeling results with a summary and conclusion of DEQ's determination.

DEQ has included the following conditions in the certification of this general permit:

1. Any applicant proposing to discharge to a high-quality water body must obtain an individual certification from DEQ.
2. Use of 2006 Human Health Criteria for Toxic Pollutants – DEQ believes that the authority to use the 2006 criteria, which were disapproved by the EPA, is reserved to the state. Thus, we have included this authorization language in our certification conditions
3. Clarification that mixing zones must be authorized by the state on a case-by-case basis.

If you have any questions or concerns regarding the contents of this package, please contact Miranda Adams 208-373-0574 or via email at Miranda.adams@deq.idaho.gov.

Sincerely

Barry N. Burnell
Water Quality Division Administrator

BNB:MA:jy

Enclosures (4)

cc: Jill Nogi, EPA Region 10
Susan Poulsom, EPA Region 10

Idaho Department of Environmental Quality

DRAFT §401 Water Quality Certification

March 5th, 2014

Permit Name/Number: Groundwater Remediation Discharge Facilities General Permit IDG-911000

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended, 33 USC Section 1341 (a)(1), and Idaho Code §§ 39-101 et.seq., and 39-3601 et.seq., the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollutant Discharge Elimination System (NPDES) permits and issue water quality certification decisions.

Based upon its review of the above-referenced permit, associated fact sheet and supporting information received on February 6th, 2014, DEQ certifies that if the permittee complies with the terms and conditions imposed by the permit along with the conditions set forth in this water quality certification, then there is reasonable assurance the discharge will comply with the applicable requirements of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, including the Idaho Water Quality Standards (WQS) (IDAPA 58.01.02) and other appropriate water quality requirements of State law.

This certification does not constitute authorization of the permitted activities by any other state or federal agency or private person or entity. This certification does not excuse the permit holder from the obligation to obtain any other necessary approvals, authorizations or permits, including without limitation, the approval from the owner of a private water conveyance system, if one is required, to use the system in connection with the permitted activities.

Antidegradation Review

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

- Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be

allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).

- Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

Pollutants of Concern

A variety of conventional, non-conventional, and toxic pollutants are expected to be present in discharges authorized under the Groundwater Remediation General Permit (GWGP). See EPA's Fact Sheet for a complete list of pollutants associated with ground water remediation facilities covered by this permit, and for how the effluent limits were calculated.

Receiving Water Body Level of Protection

The GWGP provides coverage to facilities throughout the entire State of Idaho. Because of the statewide applicability, all of the jurisdictional waters within Idaho could potentially receive discharges either directly or indirectly from facilities covered under the GWGP. As previously mentioned, DEQ uses a water body by water body approach when determining the level of antidegradation protection a water body will receive.

All waters in Idaho that receive discharges from facilities authorized in the GWGP will receive, at minimum, Tier 1 antidegradation protection because Idaho's antidegradation policy applies to all Waters of the State. Water bodies that fully support their aquatic life or recreational uses are considered to be "high quality waters" and receive Tier 2 antidegradation protection, in addition to Tier 1 protections. Although Idaho does not currently have any outstanding resource waters (ORWs) designated, it is possible that a water body could be designated as an ORW during the life of this permit. Because of this potential, this antidegradation review will also assess whether the permit complies with the outstanding resource water requirements of Idaho's antidegradation policy.

To determine the support status of the affected water body, the permitee must use the most current EPA-approved Integrated Report, available on Idaho DEQ's website: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report.aspx. Impaired waters are identified in Categories 4 and 5 of the Integrated Report. Category 4(a) contains impaired waters for which a TMDL has been approved by EPA. Category 5 contains waters which have been identified as "impaired", for which a TMDL is needed.

DEQ's webpage also has a link to the state's map-based Integrated Report which presents information from the Integrated Report in a searchable, map-based format: http://mapcase.deq.idaho.gov/wq2010/.

If you need assistance in using these tools or for information/clarification regarding the support status of the water body you are discharging to, contact Miranda Adams at miranda.adams@deq.idaho.gov or by phone, at 208-373-0574.

Protection and Maintenance of Existing Uses (Tier 1 Protection)

As noted above, a Tier 1 review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the CWA, and requires a showing that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS such as Section 055, which addresses water quality limited waters.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited ("impaired"), and a total maximum daily load (TMDL) must be prepared for those pollutants causing the impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that are consistent with wasteload allocations in the approved TMDL. A permit with effluent limitations consistent with TMDL wasteload allocations will provide the level of water quality necessary to support existing and designated uses and therefore satisfies Tier 1 antidegradation requirements.

EPA has excluded from permit coverage, any facility proposing to discharge pollutants to a water body which has been identified as "impaired" for the specific pollutant(s) present in the discharge. The new GWGP will provide coverage to four existing facilities and one new facility which discharge to water quality impaired waters (see Table 1 below). None of these facilities, however, discharge pollutants associated with the listed impairment, and therefore, none of these facilities are excluded from permit coverage. In addition, none of these facilities have been given wasteload allocations in the associated TMDL because they do not discharge pollutants associated with the listed impairment(s).

Where technology-based limits (TBELs) were not protective enough to meet water quality standards, EPA set water quality-based effluent limits (WQBELs); these limits were calculated using the methods described in the *Technical Support Document for Water Quality-based Toxics Control* [TSD] (EPA-505-2-90-001, March 1991)]. EPA calculated WQBELs for both aquatic life and human health criteria. Where a water body is used as a drinking water supply source, the water + organism criteria were used, which is the more protective criteria. The new limits were verified by DEQ and have been determined to be in compliance with Idaho's WQS.

Table 1. Existing (E) and New (N) Facilities covered under the GWGP which discharge to Impaired waters

Facility Owner	*Facility Name and Location by City*	*Receiving Water*	*Assessment Unit*	*Beneficial Uses*	*Pollutants causing impairment*
Univar USA, Inc.	Boise Towne Square Mall (E), Boise Westpark Shopping Center (E), Boise North Five Mile Road (E), Boise	Lower Boise River via Finch Lateral and storm drain system	17050114SW005_06b	• CWAL[1] • SS[2] • PCR[3]	• Low flow alterations • Physical substrate habitat alterations • Temperature • Sedimentation/Siltation • Total Phosphorus
McCall Oil	McCall Oil and Chemical Co. (E), Nampa	Lower Boise River via Mason Creek	17050114SW006_02	• CWAL[1] • SCR[4]	• Cause Unknown: (Chlorpyrifos suspected) • Sedimentation/Siltation • Temperature
Boise State University	Boise State University (N), Boise	Lower Boise River	17050114SW011a_06	• CWAL[1] • SS[2] • PCR[3]	• Low flow alterations • Physical substrate habitat alterations • Temperature

[1]CWAL = cold water aquatic life
[2]SS = salmonid spawning
[3]PCR = primary contact recreation
[4]SCR = secondary contact recreation

In general, the proposed draft GWGP sets more stringent effluent limits than the previous permit; twenty-seven (27) of the water quality based effluent limits (WQBELs) are more stringent than in the previous permit. Some effluent limits are less stringent than in the previous permit; however, EPA conducted an anti-backsliding analysis and provided the justification for setting less stringent limits for a handful of pollutants. DEQ concurs with the conclusions drawn by EPA that these limits will still be protective of water quality and beneficial uses and will meet WQS.

In addition to increasing the frequency of discharge monitoring, EPA is requiring monitoring for an additional list of contaminants until it is sufficiently demonstrated that such contaminants are not present in the discharge. EPA has also added a requirement for the submission of a best management practices (BMP) plan by the facility.

The limitations and requirements contained in the GWGP will ensure compliance with the narrative and numeric criteria in the Idaho WQS. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in compliance with the Tier 1 provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

Protection of High-Quality Waters (Tier 2 Protection)

As indicated previously, water bodies that fully support their beneficial uses will be provided Tier 2 protection. As such, the quality of these waters must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important economic or social development. For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license. For a new permit or license, the effect on water quality is determined by reviewing the difference between the existing receiving water quality and the water quality that would result from the activity or discharge as proposed in the new permit or license (IDAPA 58.01.02.052.06.a).

The GWGP, as is currently written, allows coverage for discharges to Tier 2 waters. DEQ cannot ensure compliance with the Tier 2 antidegradation provisions for such discharges. As a result, DEQ has included as a condition to this 401 certification, that the permit may authorize discharges to those waters that are identified in the most recent EPA-approved Integrated Report as "fully supporting" it's assessed uses, only if the facility receives an individual certification from DEQ that the discharge meets WQS, including the antidegradation provisions.

There is one existing facility (Table 2, below) that discharges to a high-quality water and that had coverage under the previous permit and whose discharge will be granted under the new permit. The Idaho Falls Pole Yard discharges to a Snake River assessment unit which is included in Category 3 ("unassessed waters") of the 2010 Integrated Report. Unassessed waters are provided an appropriate level of protection on a case-by-case basis using available information (IDAPA 58.01.02.052.05.b). Based on available information, DEQ has determined that this Snake River assessment unit is a high-quality water body. The permit limits in the new GWGP are the same or more stringent than the limits in the previous GWGP. Therefore, there will be no degradation as a result of coverage under the GWGP for this facility.

Given the 401 certification condition which prohibits coverage for facilities that discharge to high-quality waters unless DEQ certifies through an individual certification that the discharge meets WQS, DEQ believes the GWGP meets the antidegradation provisions concerning high-quality water bodies (58.01.02.051.02; 58.01.02.052.08).

Table 2. Facilities covered under the GWGP which discharge to High-Quality waters

Facility Owner	*Facility Name and Location by City*	*Receiving Water*	*Assessment Unit*	*Designated Uses*
Pacificorp, Inc.	Idaho Falls Pole Yard	Snake River	17040201SK001_04	• Cold Water Aquatic Life • Salmonid Spawning • Primary Contact Recreation • Drinking Water Supply

Protection of Outstanding Resource Waters (Tier 3 Protection)

Idaho's antidegradation policy requires that the quality of outstanding resource waters be maintained and protected from the impacts of point source discharges. No water bodies in Idaho have been designated as outstanding resource waters to date; however, it is possible that waters may become designated during the term of the GWGP. Because of this possibility, DEQ has evaluated whether the proposed final GWGP complies with the ORW antidegradation provision.

The GWGP does not authorize discharges to ORWs; EPA is requiring any applicant proposing to discharge to an ORW, should one become designated during the life of this permit, to obtain an individual permit from EPA and thus, an individual certification from DEQ. This requirement complies with Idaho's antidegradation provisions concerning ORWs (IDAPA 58.01.02.051.03; 58.01.02.052.09).

Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

High-Quality Waters

The GWGP may authorize discharges to waters identified in the most recent EPA-approved Integrated Report as "fully supporting" assessed uses, if DEQ certifies, through an individual certification, that such discharge complies with WQS, including the Tier 2 antidegradation provisions.

Use of 2006 Human Health Criteria for Toxic Pollutants

On May 10, 2012, EPA disapproved DEQ's human health criteria for toxic pollutants that were submitted to EPA for review on July 7, 2006. EPA's disapproval means that DEQ's previous human health criteria that were approved by EPA in 1996 are the WQS effective for Clean Water Act purposes. States are authorized, however, to include conditions in certifications necessary to assure compliance with other appropriate requirements of State law. The 2006 human health criteria continue to be effective under state law, and are an appropriate water quality requirement of state law. Therefore, the GWGP shall use the 2006 human health criteria for toxic pollutants to determine WQBELs.

Mixing Zones

Mixing zones are authorized on a case-by-case basis by DEQ to facilities subject to WQBELs who request a mixing zone in their NOI. Mixing zones cannot be authorized to facilities for pollutants that are identified as the cause of impairment in any water body not supporting its beneficial uses. Mixing zones also do not apply where TBELs have been established as the basis for the effluent limits, as they are not water quality related limits. Maximum daily limits and average monthly limits have been added to the permit for dischargers who are granted a mixing zone by DEQ; thus, a mixing zone which would

allow for an exceedance of the TBELs cannot be granted, since the TBELs are the maximum effluent limits established by EPA.

The use of mixing zones to determine effluent limits other than the WQBELs established in the permit *must be authorized by DEQ* (IDAPA 58.01.02.060). The GWGP only allows the use of mixing zones if DEQ authorizes the mixing zone through an individual 401 certification, and is therefore, consistent with state WQS.

DEQ intends to grant a mixing zone for Tetrachloroethylene (PCE) to Boise State University (BSU) for the ground water discharge proposed under this permit. The authorization letter, granting this mixing zone, is included as Attachment A. The mixing zone analysis is included in this certification as Attachment B. The CORMIX models are included as Appendix C.

Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5), and the Rules of Administrative Procedure Before the Board of Environmental Quality, IDAPA 58.01.23, within 35 days of the date of the final certification.

Questions regarding the actions taken in this certification should be directed to Miranda Adams, IDEQ State Office, at (208) 373-0574 or miranda.adams@deq.idaho.gov.

DRAFT

Barry N. Burnell
Administrator
IDEQ Water Quality Division

Attachment A. Mixing Zone Authorization for Boise State University

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

March 6, 2014

Michael J. Lidgard
NPDES Unit Manager
U.S. EPA Region 10
Attn: OWW-130
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Re: Mixing Zone Authorization for Boise State University,

Dear Mr. Lidgard,

Boise State University (BSU) has applied for coverage under EPA's NPDES Groundwater Remediation General Permit (GWGP) to discharge pumped ground water that contains Tetrachloroethylene (PCE) to the Boise River. EPA established both water quality-based effluent limits (WQBELs) and technology-based limits (TBELs) in the GWGP. Based on past data collection and laboratory analysis, BSU cannot meet the WQBELs without treating the ground water prior to discharging to the river and thus, has requested a mixing zone from DEQ. DEQ conducted a mixing zone analysis and CORMIX modeling analysis and has concluded that a mixing zone is appropriate and that BSU should be given the TBELs as their effluent limits. These are the maximum allowable limits as set forth by EPA; BSU should able to meet these end-of-pipe limits and comply with water quality standards, as demonstrated by the mixing zone analysis conducted by DEQ. This analysis demonstrates that if BSU discharges the maximum allowable limits (TBELs), only a very small mixing zone is needed (roughly 3%) to meet the in-stream criterion for PCE. Because less than five percent of the harmonic mean flows of the river are needed to meet the PCE criterion, DEQ recommends that BSU be allowed to discharge at the maximum allowed limits as set forth in the permit.

Based on the above information, and pursuant to IDAPA 58.01.02.060, DEQ hereby authorizes a mixing zone and the use of TBELs as effluent limits for BSU.

If you have any questions or concerns regarding this authorization, please contact Miranda Adams at 208-373-0574 or via email at Miranda.adams@deq.idaho.gov

Sincerely,

Barry N. Burnell

Barry N. Burnell
Water Quality Division Administrator

BNB:MA:jy

Cc: Sarah Hansen, Boise State University

Attachment B. Tetrachloroethylene Plume and Mixing Zone Analysis: Boise State University Ground Water Discharge to the Boise River

Background

DEQ Technical Services was asked to examine the plume dynamics through CORMIX modeling of a Tetrachloroethylene (PCE) discharge from Boise State University (BSU) sump pumping through outfalls to the Boise River. We examined the discharge outfall locations in the field and determined that discharge configurations were likely side channel discharges. After water left the outfall pipe it probably traveled over land variable distances through small channels to the Boise River. We also examined sampling data of the discharges from previous years to derive an expected discharge concentration of PCE. These data (Figure 1) suggest that while concentration appears to be decreasing in recent years, the concentration is variable from year to year. This is likely due to varying high flow/low flow water years of the Boise River (the likely principle source of ground water) and perhaps the variable dynamics of the ground water pollution itself.

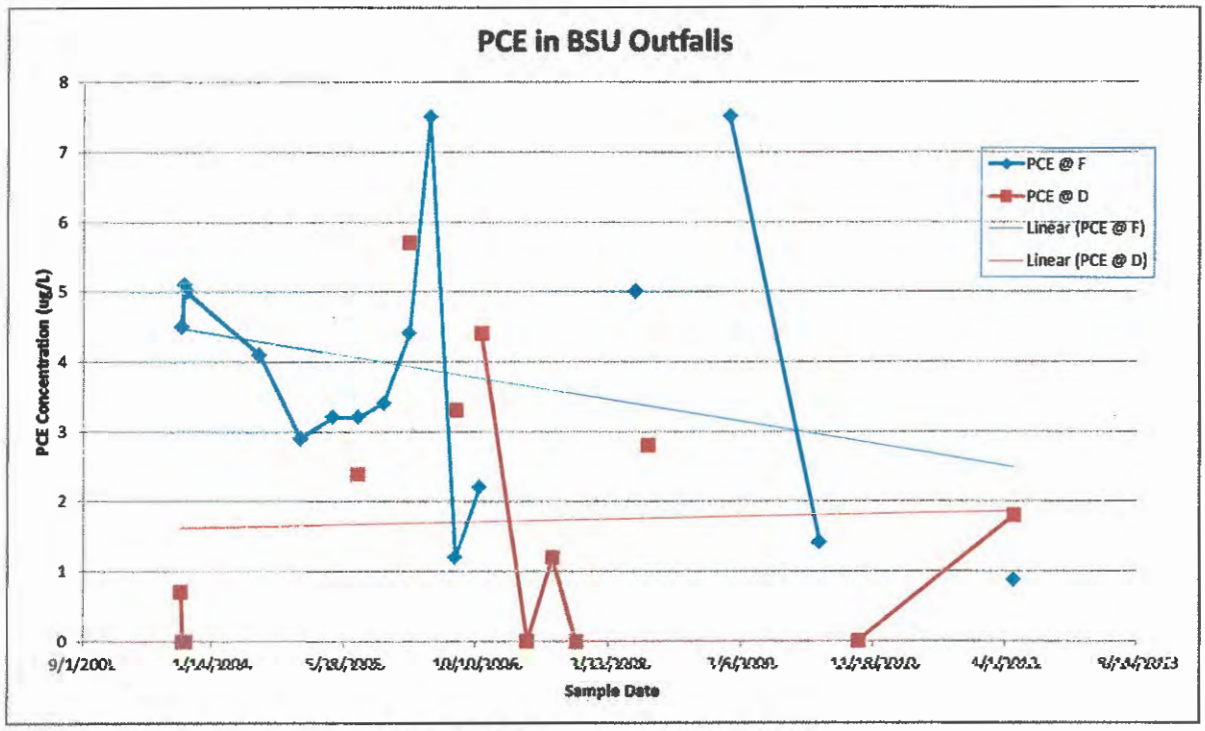

Figure 1. PCE concentrations in BSU outfall sampling, 2003 – 2012

It is important to note that low flow years in the future may allow the PCE concentrations to build up in the ground water beneath BSU buildings due to lower amounts of pumping. Such low flow years may cause discharge concentrations to spike during high flow years when increased pumping is necessary, as has occurred in the past.

CORMIX Modeling

For modeling purposes, we set the discharge concentration equivalent to the technology based limits (TBELs) as set forth in the NPDES Groundwater Remediation General Permit (Average

Monthly Limit [AML] = 3.4 ug/L; Maximum Daily Limit [MDL] = 5.0 ug/L). These limits represent the maximum limits allowed for PCE at end-of-pipe. These are the limits that BSU must comply with in order to be in compliance with the permit.

According to the City of Boise Lander Street NPDES Permit recently issued by EPA, the harmonic mean flow of the Boise River as calculated using data collected at the Glenwood Bridge gaging station (October 1-April 30), is 240 cubic feet per second (cfs). We modeled the plume using this harmonic mean flow.

The CORMIX model input parameters are as follows:

- Boise River harmonic mean flow (ambient) – 240 cfs, 100 feet (30.48 meters) wide uniform bounded, 1.3 feet (0.4 meters) average depth, 12°C, Manning's n = 0.03, wind speed = 2 meters/second.
- Discharge (effluent) – 1.2 cfs, 5.0 ug/L and 3.4 ug/L, 12°C, flush side channel discharge 10 feet (3 meters) wide and 0.5 feet (0.15 meters) deep, Sigma = 30°, bottom slope = 10%, depth at discharge = 1 feet (0.3 meters)
- Water Quality Human Health criteria for PCE: organism only = 3.3 ug/L, water+organism = 0.69 ug/L. The Boise River is designated for domestic water supply (DWS), thus the water+organism criteria (0.69 ug/L) is the applicable standard for the purpose of establishing a mixing zone and effluent limits for BSU's discharge.

Results

MDL (5.0 ug/L): The resulting discharge plume is long and narrow typical of a side channel discharge to a faster moving river. Under these conditions, the discharge created a small recirculation bubble that tends to complicate CORMIX's ability to calculate near field mixing distances. The water+organism criterion (0.69 ug/L) was met at 36 meters downstream of the point of discharge. The plume was approximately 2.2 m wide, completely vertically mixed, and had a corresponding dilution of seven and three tenths (7.3). This means that it would take over seven times the volume of the effluent to dilute down to the criterion at the distances specified here. The plume's width at the edge of the mixing zone, where the human health criterion was met, occupied about 7% of the width of the river. Drift time, which is the amount of time it takes to travel from the discharge point to the end of the mixing zone at harmonic mean flow velocity, through the plume is approximately two (2) minutes.

AML (3.4 ug/L): The resulting discharge plume is similar to the one above. Under these conditions, the discharge created a small recirculation bubble that tends to complicate CORMIX's ability to calculate near field mixing distances. The water+organism criterion was met at 17 meters downstream of the point of discharge. The plume was approximately 1.5 m wide, completely vertically mixed, and had a corresponding dilution of five (5). This means that it

would take five times the volume of the effluent to dilute down to the criteria in-stream at the distances specified here. The plume's width at the edge of the mixing zone, where the water + organism human health criterion was met, occupied about 5% of the width of the river. Drift time through the plume is approximately 1 minute.

The mass balance equation for determining an appropriate mixing zone is:

$$C_d = (C_e \times Q_e) + (Cu \times (Q_u \times MZ\%) / Q_e (Q_u \times MZ\%)$$

where:

C_d = receiving water concentration of PCE at the edge of the mixing zone
C_e = maximum effluent limit allowed for PCE according to permit (TBEL)
Q_e = maximum effluent flow (discharge) from BSU discharge
C_u = upstream (background) concentration of pollutant
Q_u = Boise River flow (harmonic mean)
MZ = mixing zone percentage

Table 1. Mixing Zone percentages and corresponding PCE concentrations at the edge of the mixing zone

Mixing Zone %	PCE concentration at edge of mixing zone where C_e = AML (3.4 ug/L)	PCE concentration at edge of mixing zone where C_e = MDL (5.0 ug/L)	Idaho Human Health criterion for PCE
25	0.067 ug/L	0.098 ug/L	0.69 ug/L
10	0.162 ug/L	0.238 ug/L	
5	0.309 ug/L	0.455 ug/L	
3	0.486 ug/L	0.714 ug/L	

Conclusions

As demonstrated in the CORMIX modeling results, discharging PCE at the maximum allowed limits in the Groundwater Remediation General Permit (3.4 and 5.0 ug/L) does not pose an unacceptable risk to human health or aquatic life. An adequate zone of passage would be provided and cumulative travel time through the plume for passive drift is approximately one to two (1 – 2) minutes. The 36 meter-long plume downstream of the discharge is in an entirely wooded riparian corridor with no public features (designated public beaches, water intakes, boat launches, etc.); this minimizes the risk of human exposure.

As is further demonstrated in Table 1 (above), if BSU discharges at the maximum allowed limits (TBELs) as set forth in the permit, the in-stream PCE concentrations will be in compliance with the state's human health criterion (0.69 ug/L) with a mixing zone size of roughly 3% of the volume of the Boise River even during low flow months. For this reason, DEQ has concluded

that BSU should be given the maximum discharge concentrations for PCE allowed (TBELs), with this mixing zone analysis and authorization from DEQ, under the NPDES permit limits. The modeling results demonstrate that these maximum allowable discharge limits are more than adequate to meet water quality standards and to protect beneficial uses of the Boise River.

Attachment C. CORMIX Model output files

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 8.0GTD
                       HYDRO3:Version-8.0.0.0  April,2012
SITE NAME/LABEL:                Outfall  D or F
  DESIGN CASE:                  BSU - Perc plume
  FILE NAME:                    C:\data\ALLTECH\WATER\401certs\BSU 2013\BSU perc runharmonic3 4.prd
  Using subsystem CORMIX3:      Buoyant Surface Discharges
  Start of session:             02/26/2014--11:27:48
***************************************************************************
SUMMARY OF INPUT DATA:
---------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                         = bounded
  Width                        BS       = 30.48 m
  Channel regularity           ICHREG   = 1
  Ambient flowrate             QA       = 6.80 m^3/s
  Average depth                HA       = 0.40 m
  Depth at discharge           HD       = 0.30 m
  Ambient velocity             UA       = 0.5627 m/s
  Darcy-Weisbach friction factor  F     = 0.0961
    Calculated from Manning's n         = 0.03
  Wind velocity                UW       = 2 m/s
  Stratification Type          STRCND   = U
  Surface temperature                   = 12 degC
  Bottom temperature                    = 12 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density              RHOAS    = 999.4994 kg/m^3
  Bottom density               RHOAB    = 999.4994 kg/m^3
---------------------------------------------------------------------------
DISCHARGE PARAMETERS:                   Surface Discharge
  Discharge located on                  = left bank/shoreline
  Discharge configuration               = flush discharge
  Distance from bank to outlet  DISTB   = 0 m
  Discharge angle               SIGMA   = 30 deg
  Depth near discharge outlet   HD0     = 0.30 m
  Bottom slope at discharge     SLOPE   = 0 deg
  Rectangular discharge:
    Discharge cross-section area  A0    = 0.464515 m^2
    Discharge channel width       B0    = 3.048 m
    Discharge channel depth       H0    = 0.1524 m
    Discharge aspect ratio        AR    = 0.05
  Discharge flowrate            Q0      = 0.033980 m^3/s
  Discharge velocity            U0      = 0.07 m/s
  Discharge temperature (freshwater)    = 12 degC
  Corresponding density         RHO0    = 999.4994 kg/m^3
  Density difference            DRHO    = 0 kg/m^3
  Buoyant acceleration          GP0     = 0 m/s^2
  Discharge concentration       C0      = 3.4 ppb
  Surface heat exchange coeff.  KS      = 0 m/s
  Coefficient of decay          KD      = 0 /s
---------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 0.68 m          Lm  = 0.09 m          Lbb = 0 m
  LM  = 99999 m
---------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number     FR0     = 99999 (based on LQ)
  Channel densimetric Froude no. FRCH   = 99999 (based on H0)
  Velocity ratio                R       = 0.13
---------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                       = yes
  CMC concentration             CMC     = 3.3 ppb
  CCC concentration             CCC     = 0.69 ppb
  Water quality standard specified      = given by CCC value
  Regulatory mixing zone                = no
  Region of interest                    = 305 m downstream
***************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *------------------------*
  | FLOW CLASS    = SA1 |
  *------------------------*
***************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

---------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at water surface and at centerline of discharge channel:
    0 m from the left bank/shore.
  Number of display steps NSTEP = 20 per module.
---------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge   c = 1.7557 ppb
  Dilution at edge of NFR               s = 1.9
  NFR Location:                         x = 2.26 m
```

@3.4 ug/L

```
    (centerline coordinates)          y = 0 m
                                      z = 0 m
  NFR plume dimensions:  half-width (bh) = 1.91 m
                        thickness (bv) = 0.30 m
Cumulative travel time:       31.9294 sec.
------------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is equal or about about equal to the surrounding
  ambient water density at the discharge level.
  Therefore, the effluent behaves essentially as NEUTRALLY BUOYANT.
------------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume becomes vertically fully mixed ALREADY IN NEAR-FIELD at 17.40 m
  downstream and continues as vertically mixed into the far-field.
------------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts one bank only at 0 m downstream.
********************** TOXIC DILUTION ZONE SUMMARY **********************
Recall: The TDZ corresponds to the three (3) criteria issued in the USEPA
  Technical Support Document (TSD) for Water Quality-based Toxics Control,
  1991 (EPA/505/2-90-001).
  Criterion maximum concentration (CMC)  = 3.3  ppb
Corresponding dilution                   = 1.030303
The CMC was encountered at the following plume position:
  Plume location:                   x = 3.54 m
    (centerline coordinates)        y = 0 m
                                    z = 0 m
  Plume dimension:       half-width (bh) = 1.98 m
                        thickness (bv) = 0.30 m

 Computed distance from port opening to CMC location = 3.54 m.
 CRITERION 1: This location is within 50 times the discharge length scale of
              Lq = 0.68 m.
 +++++ The discharge length scale TEST for the TDZ has been SATISFIED. ++++++

 Computed horizontal distance from port opening to CMC location = 3.54 m.
 CRITERION 2: This location is beyond 5 times the ambient water depth of
              HD = 0.30 m.
 ++++++++++ The ambient depth TEST for the TDZ has FAILED. ++++++++++

 CRITERION 3: No RMZ has been defined. Therefore, the Regulatory Mixing zone
              test for the TDZ cannot be applied.

 The diffuser discharge velocity is equal to 0.07 m/s.
 This is below the value of 3.0 m/s recommended in the TSD.

 *** This discharge DOES NOT SATISFY all three CMC criteria for the TDZ. ****
 **** This MAY be caused by the low discharge velocity for this design. *****
******************** REGULATORY MIXING ZONE SUMMARY **********************
No RMZ has been specified.
However:
The CCC was encountered at the following plume position:
The CCC for the toxic pollutant was encountered at the following
  plume position:
  CCC                               = 0.69  ppb
Corresponding dilution              = 5.0
  Plume location:                   x = 17.06 m
    (centerline coordinates)        y = 0 m
                                    z = 0 m
  Plume dimensions:      half-width (bh) = 0.76 m
                        thickness (bv) = 0.40 m
******************** FINAL DESIGN ADVICE AND COMMENTS ********************
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

```
CORMIX3 PREDICTION FILE:
3333333333333333333333333333333333333333333333333333333333333333333333333333333333333333
                        CORMIX MIXING ZONE EXPERT SYSTEM
                  Subsystem CORMIX3: Buoyant Surface Discharges
                              CORMIX Version 8.0GTD
                         HYDRO3 Version 8.0.0.0 April 2012
------------------------------------------------------------------------------
------------------------------------------------------------------------------
CASE DESCRIPTION
 Site name/label:    Outfall  D or F
 Design case:        BSU - Perc plume
 FILE NAME:          C:\...TER\401certs\BSU 2013\BSU perc runharmonic3_4.prd
 Time stamp:         Wed Feb 26 11:27:48 2014

ENVIRONMENT PARAMETERS (metric units)
 Bounded section
 BS    =     30.48  AS    =     12.08  QA    =      6.80  ICHREG= 1
 HA    =      0.40  HD    =      0.30
 UA    =     0.563  F     =     0.096 USTAR =0.6167E-01
 UW    =     2.000 UWSTAR=0.2198E-02
 Uniform density environment
 STRCND=  U          REOAM =  999.4994

DISCHARGE PARAMETERS (metric units)
 BANK  =  LEFT       DISTB =      0.00  Configuration: flush_discharge
 SIGMA =     30.00  HDO   =      0.30  SLOPE =     0.00 deg.
 Rectangular channel geometry:
 B0    =     3.048 H0    =     0.152 A0    =0.4645E+00  AR    =     0.050
 U0    =     0.073 Q0    =     0.034       =0.3398E-01
 RHO0  =  999.4994  DRHO0 =0.0000E+00  GP0   =0.0000E+00
 C0    =0.3400E+01  CUNITS=  ppb
 IPOLL =  1          KS    =0.0000E+00  KD    =0.0000E+00

FLUX VARIABLES (metric units)
 Q0    =0.3398E-01  M0    =0.2486E-02  J0    =0.0000E+00
 Associated length scales (meters)
 LQ    =     0.68  LM    =  99999.00  Lm    =      0.09  Lb    =     0.00

NON-DIMENSIONAL PARAMETERS
 FR0   =  99999.00  FRCH  =  99999.00  R     =      0.13

FLOW CLASSIFICATION
 333333333333333333333333333333333333333333
 3  Flow class (CORMIX3)      =    SA1    3
 3  Applicable layer depth HS =     0.30  3
 333333333333333333333333333333333333333333

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0    =0.3400E+01  CUNITS=  ppb
 NTOX  =  1         CMC   =0.3300E+01  CCC   =  CSTD
 NSTD  =  1         CSTD  =0.6900E+00
 REGMZ =  0
 XINT  =    305.00  XMAX  =    305.00

X-Y-Z COORDINATE SYSTEM:
    ORIGIN is located at the WATER SURFACE and at center of discharge
      channel/outlet:      0.00 m  from the LEFT  bank/shore.
    X-axis points downstream
    Y-axis points to left as seen by an observer looking downstream
    Z-axis points vertically upward (in CORMIX3, all values Z = 0.00)
NSTEP =  20 display intervals per module
------------------------------------------------------------------------------
------------------------------------------------------------------------------
BEGIN MOD301: DISCHARGE MODULE

 Efflux conditions:
       X        Y        Z        S        C        BV        BH        TT
    0.00     0.00     0.00     1.0 0.340E+01   0.15     1.52 .00000E+00

END OF MOD301: DISCHARGE MODULE
------------------------------------------------------------------------------
------------------------------------------------------------------------------
BEGIN MOD302: ZONE OF FLOW ESTABLISHMENT

  Control volume inflow:
       X        Y        Z        S        C        BV        BH        TT
    0.00     0.00     0.00     1.0 0.340E+01   0.15     1.52 .00000E+00

 Profile definitions:
   BV = Gaussian 1/e (37%) vertical thickness
   BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction efects, if any)
   TT = Cumulative travel time

 Control volume outflow:                                  SIGMAE=    353.94
       X        Y        Z        S        C        BV        BH        TT
    1.40    -0.28     0.00     1.0 0.340E+01   0.15     0.28 .19549E+02
 Cumulative travel time =          19.5489 sec  (    0.01 hrs)

END OF MOD302: ZONE OF FLOW ESTABLISHMENT
```

```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
BEGIN CORSURF (MOD310): BUOYANT SURFACE JET - NEAR-FIELD REGION

 Surface jet in deep crossflow with shoreline-attachment.

 Profile definitions:
   BV = Gaussian 1/e (37%) vertical thickness
   BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction efects, if any)
   TT = Cumulative travel time

       X        Y        Z        S        C        BV       BH        TT
     1.40    -0.28     0.00      1.0 0.340E+01   0.15     0.28 .19549E+02
  Maximum lateral extent of recirculation bubble.
  Jet/plume becomes VERTICALLY FULLY MIXED over the local ambient water depth.
     BV = water depth (vertically mixed)
     1.41    -0.28     0.00      1.5 0.232E+01   0.52     0.94 .19549E+02
     1.41    -0.28     0.00      1.5 0.232E+01   0.30     0.94 .19549E+02
  End of recirculation bubble at the above position.
   Dilution in recirculation bubble =     1.4
   Corresponding concentration      =     0.237E+01
  Flow continues as WALL JET/PLUME.
** CMC HAS BEEN FOUND **
 The pollutant concentration in the plume falls below CMC value of 0.330E+01
   in the current prediction interval.
 This is the extent of the TOXIC DILUTION ZONE.
     1.45     0.00     0.00      2.1 0.163E+01   0.30     1.89 .19915E+02
     1.50     0.00     0.00      2.1 0.166E+01   0.30     1.89 .20236E+02
     1.54     0.00     0.00      2.0 0.168E+01   0.30     1.89 .20573E+02
     1.58     0.00     0.00      2.0 0.170E+01   0.30     1.89 .20927E+02
     1.62     0.00     0.00      2.0 0.171E+01   0.30     1.89 .21301E+02
     1.67     0.00     0.00      2.0 0.173E+01   0.30     1.89 .21695E+02
     1.71     0.00     0.00      2.0 0.174E+01   0.30     1.90 .22113E+02
     1.75     0.00     0.00      1.9 0.175E+01   0.30     1.90 .22556E+02
     1.80     0.00     0.00      1.9 0.175E+01   0.30     1.90 .23028E+02
     1.84     0.00     0.00      1.9 0.176E+01   0.30     1.90 .23532E+02
     1.88     0.00     0.00      1.9 0.176E+01   0.30     1.90 .24073E+02
     1.92     0.00     0.00      1.9 0.177E+01   0.30     1.90 .24655E+02
     1.97     0.00     0.00      1.9 0.177E+01   0.30     1.90 .25284E+02
     2.01     0.00     0.00      1.9 0.177E+01   0.30     1.90 .25969E+02
     2.05     0.00     0.00      1.9 0.177E+01   0.30     1.91 .26718E+02
     2.10     0.00     0.00      1.9 0.177E+01   0.30     1.91 .27546E+02
     2.14     0.00     0.00      1.9 0.176E+01   0.30     1.91 .28467E+02
     2.18     0.00     0.00      1.9 0.176E+01   0.30     1.91 .29506E+02
     2.22     0.00     0.00      1.9 0.176E+01   0.30     1.91 .30694E+02
     2.26     0.00     0.00      1.9 0.176E+01   0.30     1.91 .31929E+02
 Cumulative travel time =          31.9294 sec  (    0.01 hrs)

END OF CORSURF (MOD310): BUOYANT SURFACE JET - NEAR-FIELD REGION
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
** End of NEAR-FIELD REGION (NFR) **
--------------------------------------------------------------------------------

 WAKE FLOW CONDITIONS: The discharge velocity (U0) is less than or equal to the
 ambient velocity (Ua) and results in wake flow conditions. There is no discharge
 momentum induced mixing. The mixing characteristics are UNDESIRABLE.

 The initial plume WIDTH/THICKNESS VALUE in the next far-field module will be
  CORRECTED by a factor  0.45 to conserve the mass flux in the far-field!

 Some bank/shore interaction occurs at end of near-field.

 In the next prediction module, the jet/plume centerline will be set
   to follow the bank/shore.
--------------------------------------------------------------------------------
BEGIN MOD341: BUOYANT AMBIENT SPREADING

 Plume is ATTACHED to LEFT  bank/shore.
   Plume width is now determined from LEFT  bank/shore.

 Plume condition is non-buoyant or weakly buoyant, or, at the end of the NFR
   it is governed by full vertical mixing over the ambient depth,
   or by complete lateral mixing over the channel width.
 Thus, the BUOYANT SPREADING REGIME is ABSENT.

END OF MOD341: BUOYANT AMBIENT SPREADING
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
BEGIN MOD361: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

  Vertical diffusivity (initial value)   = 0.489E-02 m^2/s
  Horizontal diffusivity (initial value) = 0.611E-02 m^2/s

 Profile definitions:
   BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
      = or equal to water depth, if fully mixed
   BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
        measured horizontally in Y-direction
```

```
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction efects, if any)
   TT = Cumulative travel time

 Plume Stage 2 (bank attached):
       X        Y        Z        S        C        BV       BH        TT
    2.26     0.00     0.00      1.9 0.176E+01   0.40     0.29 .31929E+02
** WATER QUALITY STANDARD OR CCC HAS BEEN FOUND **
 The pollutant concentration in the plume falls below water quality standard
   or CCC value of 0.690E+00 in the current prediction interval.
 This is the spatial extent of concentrations exceeding the water quality
   standard or CCC value.
 Plume interacts with BOTTOM.
 The passive diffusion plume becomes VERTICALLY FULLY MIXED within this
   prediction interval.
   17.40     0.00     0.00      5.1 0.666E+00   0.40     0.77 .58696E+02
   32.54     0.00     0.00      7.0 0.488E+00   0.40     1.06 .85462E+02
   47.67     0.00     0.00      8.4 0.404E+00   0.40     1.28 .11223E+03
   62.81     0.00     0.00      9.7 0.352E+00   0.40     1.46 .13899E+03
   77.95     0.00     0.00     10.7 0.316E+00   0.40     1.63 .16576E+03
   93.08     0.00     0.00     11.7 0.290E+00   0.40     1.78 .19253E+03
  108.22     0.00     0.00     12.7 0.269E+00   0.40     1.92 .21929E+03
  123.36     0.00     0.00     13.5 0.252E+00   0.40     2.05 .24606E+03
  138.49     0.00     0.00     14.3 0.238E+00   0.40     2.17 .27283E+03
  153.63     0.00     0.00     15.1 0.226E+00   0.40     2.29 .29959E+03
  168.77     0.00     0.00     15.8 0.215E+00   0.40     2.40 .32636E+03
  183.90     0.00     0.00     16.5 0.206E+00   0.40     2.50 .35312E+03
  199.04     0.00     0.00     17.2 0.198E+00   0.40     2.60 .37989E+03
  214.18     0.00     0.00     17.8 0.191E+00   0.40     2.70 .40666E+03
  229.32     0.00     0.00     18.4 0.185E+00   0.40     2.79 .43342E+03
  244.45     0.00     0.00     19.0 0.179E+00   0.40     2.88 .46019E+03
  259.59     0.00     0.00     19.6 0.174E+00   0.40     2.97 .48696E+03
  274.73     0.00     0.00     20.1 0.169E+00   0.40     3.06 .51372E+03
  289.86     0.00     0.00     20.7 0.164E+00   0.40     3.14 .54049E+03
  305.00     0.00     0.00     21.2 0.160E+00   0.40     3.22 .56726E+03
 Cumulative travel time =         567.2554 sec  (    0.16 hrs)

 Simulation limit based on maximum specified distance =    305.00 m.
   This is the REGION OF INTEREST limitation.

END OF MOD361: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
CORMIX3: Buoyant Surface Discharges                    End of Prediction File
333333333333333333333333333333333333333333333333333333333333333333333333333333
```

```
    (centerline coordinates)          y = 0 m
                                      z = 0 m
  NFR plume dimensions:  half-width (bh) = 1.91 m
                         thickness (bv) = 0.30 m
Cumulative travel time:        31.9294 sec.
-------------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is equal or about about equal to the surrounding
  ambient water density at the discharge level.
  Therefore, the effluent behaves essentially as NEUTRALLY BUOYANT.
-------------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume becomes vertically fully mixed ALREADY IN NEAR-FIELD at 17.40 m
  downstream and continues as vertically mixed into the far-field.
-------------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts one bank only at 0 m downstream.
********************** TOXIC DILUTION ZONE SUMMARY ************************
Recall: The TDZ corresponds to the three (3) criteria issued in the USEPA
  Technical Support Document (TSD) for Water Quality-based Toxics Control,
  1991 (EPA/505/2-90-001).
  Criterion maximum concentration (CMC)  = 3.3  ppb
Corresponding dilution                   = 1.515152
The CMC was encountered at the following plume position:
  Plume location:                   x = 2.22 m
    (centerline coordinates)        y = 0 m
                                    z = 0 m
  Plume dimension:       half-width (bh) = 1.92 m
                          thickness (bv) = 0.30 m

 Computed distance from port opening to CMC location = 2.22 m.
 CRITERION 1: This location is within 50 times the discharge length scale of
              Lq = 0.68 m.
 +++++ The discharge length scale TEST for the TDZ has been SATISFIED. ++++++

 Computed horizontal distance from port opening to CMC location = 2.22 m.
 CRITERION 2: This location is beyond 5 times the ambient water depth of
              HD = 0.30 m.
 ++++++++++ The ambient depth TEST for the TDZ has FAILED. ++++++++++

 CRITERION 3: No RMZ has been defined. Therefore, the Regulatory Mixing zone
              test for the TDZ cannot be applied.

 The diffuser discharge velocity is equal to 0.07 m/s.
 This is below the value of 3.0 m/s recommended in the TSD.

 *** This discharge DOES NOT SATISFY all three CMC criteria for the TDZ. ****
 **** This MAY be caused by the low discharge velocity for this design. *****
******************** REGULATORY MIXING ZONE SUMMARY ************************
No RMZ has been specified.
However:
The CCC was encountered at the following plume position:
The CCC for the toxic pollutant was encountered at the following
  plume position:
  CCC                                = 0.69  ppb
Corresponding dilution               = 7.3
  Plume location:                    x = 35.99 m
    (centerline coordinates)         y = 0 m
                                     z = 0 m
  Plume dimensions:      half-width (bh) = 1.11 m
                         thickness (bv) = 0.40 m
******************** FINAL DESIGN ADVICE AND COMMENTS ************************
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

Water + organism criterion

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 8.0GTD
                       HYDRO3:Version-8.0.0.0  April,2012
 SITE NAME/LABEL:                Outfall F or D
   DESIGN CASE:                  BSU - Perc plume
   FILE NAME:                    C:\data\ALLTECH\WATER\401certs\BSU 2013\BSU perc runharmonic5.prd
   Using subsystem CORMIX3:     Buoyant Surface Discharges
   Start of session:             02/26/2014--11:30:02
*******************************************************************************
 SUMMARY OF INPUT DATA:
-------------------------------------------------------------------------------
 AMBIENT PARAMETERS:
   Cross-section                          = bounded
   Width                         BS       = 30.48 m
   Channel regularity            ICHREG   = 1
   Ambient flowrate              QA       = 6.80 m^3/s
   Average depth                 HA       = 0.40 m
   Depth at discharge            HD       = 0.30 m
   Ambient velocity              UA       = 0.5627 m/s
   Darcy-Weisbach friction factor F       = 0.0961
     Calculated from Manning's n          = 0.03
   Wind velocity                 UW       = 2 m/s
   Stratification Type           STRCND   = U
   Surface temperature                    = 12 degC
   Bottom temperature                     = 12 degC
   Calculated FRESH-WATER DENSITY values:
   Surface density               RHOAS    = 999.4994 kg/m^3
   Bottom density                RHOAB    = 999.4994 kg/m^3
-------------------------------------------------------------------------------
 DISCHARGE PARAMETERS:           Surface Discharge
   Discharge located on                   = left bank/shoreline
   Discharge configuration                = flush discharge
   Distance from bank to outlet  DISTB    = 0 m
   Discharge angle               SIGMA    = 30 deg
   Depth near discharge outlet   HD0      = 0.30 m
   Bottom slope at discharge     SLOPE    = 0 deg
   Rectangular discharge:
     Discharge cross-section area A0      = 0.464515 m^2
     Discharge channel width      B0      = 3.048 m
     Discharge channel depth      H0      = 0.1524 m
     Discharge aspect ratio       AR      = 0.05
   Discharge flowrate             Q0      = 0.033980 m^3/s
   Discharge velocity             U0      = 0.07 m/s
   Discharge temperature (freshwater)     = 12 degC
   Corresponding density          RHO0    = 999.4994 kg/m^3
   Density difference             DRHO    = 0 kg/m^3
   Buoyant acceleration           GP0     = 0 m/s^2
   Discharge concentration        C0      = 5 ppb
   Surface heat exchange coeff.   KS      = 0 m/s
   Coefficient of decay           KD      = 0 /s
-------------------------------------------------------------------------------
 DISCHARGE/ENVIRONMENT LENGTH SCALES:
   LQ  = 0.68 m        Lm  = 0.09 m         Lbb = 0 m
   LM  = 99999 m
-------------------------------------------------------------------------------
 NON-DIMENSIONAL PARAMETERS:
   Densimetric Froude number      FR0     = 99999 (based on LQ)
   Channel densimetric Froude no. FRCH    = 99999 (based on H0)
   Velocity ratio                 R       = 0.13
-------------------------------------------------------------------------------
 MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
   Toxic discharge                        = yes
   CMC concentration              CMC     = 3.3 ppb
   CCC concentration              CCC     = 0.69 ppb
   Water quality standard specified       = given by CCC value
   Regulatory mixing zone                 = no
   Region of interest                     = 305 m downstream
*******************************************************************************
 HYDRODYNAMIC CLASSIFICATION:
   *-------------------------*
   | FLOW CLASS    = SA1 |
   *-------------------------*
*******************************************************************************
 MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------------
 X-Y-Z Coordinate system:
 Origin is located at water surface and at centerline of discharge channel:
     0 m from the left bank/shore.
   Number of display steps NSTEP = 20 per module.
-------------------------------------------------------------------------------
 NEAR-FIELD REGION (NFR) CONDITIONS :
 Note: The NFR is the zone of strong initial mixing.  It has no regulatory
   implication.  However, this information may be useful for the discharge
   designer because the mixing in the NFR is usually sensitive to the
   discharge design conditions.
   Pollutant concentration at NFR edge  c = 2.5819 ppb
   Dilution at edge of NFR              s = 1.9
   NFR Location:                        x = 2.26 m
```

25.0 ug/L

```
CORMIX3 PREDICTION FILE:
3333333333333333333333333333333333333333333333333333333333333333333333333333333333333333
                        CORMIX MIXING ZONE EXPERT SYSTEM
                 Subsystem CORMIX3: Buoyant Surface Discharges
                             CORMIX Version 8.0GTD
                         HYDRO3 Version 8.0.0.0 April 2012
------------------------------------------------------------------------------
------------------------------------------------------------------------------
CASE DESCRIPTION
 Site name/label:   Outfall F or D
 Design case:       BSU - Perc plume
 FILE NAME:         C:\...WATER\401certs\BSU 2013\BSU perc runharmonic5.prd
 Time stamp:        Wed Feb 26 11:30:02 2014

ENVIRONMENT PARAMETERS (metric units)
 Bounded section
 BS    =     30.48 AS    =     12.08 QA    =      6.80  ICHREG= 1
 HA    =      0.40 HD    =      0.30
 UA    =     0.563 F     =     0.096 USTAR =0.6167E-01
 UW    =     2.000 UWSTAR=0.2198E-02
 Uniform density environment
 STRCND=  U         RHOAM =  999.4994

DISCHARGE PARAMETERS (metric units)
 BANK  =  LEFT      DISTB =      0.00  Configuration: flush_discharge
 SIGMA =     30.00  HDO   =      0.30  SLOPE =    0.00 deg.
 Rectangular channel geometry:
 B0    =     3.048 H0    =     0.152 A0    =0.4645E+00  AR    =      0.050
 U0    =     0.073 Q0    =     0.034       =0.3398E-01
 RHO0  =  999.4994 DRHO0 =0.0000E+00  GP0   =0.0000E+00
 C0    =0.5000E+01  CUNITS=  ppb
 IPOLL =  1         KS    =0.0000E+00  KD    =0.0000E+00

FLUX VARIABLES (metric units)
 Q0    =0.3398E-01  M0    =0.2486E-02  J0    =0.0000E+00
 Associated length scales (meters)
 LQ    =     0.68  LM    =  99999.00  Lm    =      0.09  Lb    =      0.00

NON-DIMENSIONAL PARAMETERS
 FR0   =  99999.00  FRCH  =  99999.00  R     =      0.13

FLOW CLASSIFICATION
 333333333333333333333333333333333333333333
 3  Flow class (CORMIX3)      =    SA1    3
 3  Applicable layer depth HS =     0.30  3
 333333333333333333333333333333333333333333

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0    =0.5000E+01  CUNITS=  ppb
 NTOX  =  1         CMC   =0.3300E+01  CCC   =  CSTD
 NSTD  =  1         CSTD  =0.6900E+00
 REGMZ =  0
 XINT  =    305.00  XMAX  =    305.00

X-Y-Z COORDINATE SYSTEM:
    ORIGIN is located at the WATER SURFACE and at center of discharge
      channel/outlet:      0.00 m  from the LEFT  bank/shore.
    X-axis points downstream
    Y-axis points to left as seen by an observer looking downstream
    Z-axis points vertically upward (in CORMIX3, all values Z = 0.00)
NSTEP =  20 display intervals per module
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BEGIN MOD301: DISCHARGE MODULE

 Efflux conditions:
       X        Y        Z        S        C        BV       BH         TT
    0.00     0.00     0.00     1.0 0.500E+01   0.15     1.52 .00000E+00

END OF MOD301: DISCHARGE MODULE
------------------------------------------------------------------------------
------------------------------------------------------------------------------
BEGIN MOD302: ZONE OF FLOW ESTABLISHMENT

  Control volume inflow:
       X        Y        Z        S        C        BV       BH         TT
    0.00     0.00     0.00     1.0 0.500E+01   0.15     1.52 .00000E+00

 Profile definitions:
   BV = Gaussian 1/e (37%) vertical thickness
   BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction efects, if any)
   TT = Cumulative travel time

 Control volume outflow:                                  SIGMAR=    353.94
       X        Y        Z        S        C        BV       BH         TT
    1.40    -0.28     0.00     1.0 0.500E+01   0.15     0.28 .19549E+02
 Cumulative travel time =          19.5489 sec  (    0.01 hrs)

END OF MOD302: ZONE OF FLOW ESTABLISHMENT
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BEGIN CORSURF (MOD310): BUOYANT SURFACE JET - NEAR-FIELD REGION

 Surface jet in deep crossflow with shoreline-attachment.

 Profile definitions:
   BV = Gaussian 1/e (37%) vertical thickness
   BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction efects, if any)
   TT = Cumulative travel time

       X        Y        Z        S        C        BV       BH        TT
    1.40    -0.28     0.00      1.0 0.500E+01   0.15     0.28 .19549E+02
  Maximum lateral extent of recirculation bubble.
  Jet/plume becomes VERTICALLY FULLY MIXED over the local ambient water depth.
     BV = water depth (vertically mixed)
    1.41    -0.28     0.00      1.5 0.342E+01   0.52     0.94 .19549E+02
    1.41    -0.28     0.00      1.5 0.342E+01   0.30     0.94 .19549E+02
  End of recirculation bubble at the above position.
   Dilution in recirculation bubble =     1.4
   Corresponding concentration      =     0.348E+01
  Flow continues as WALL JET/PLUME.
** CMC HAS BEEN FOUND **
 The pollutant concentration in the plume falls below CMC value of 0.330E+01
   in the current prediction interval.
 This is the extent of the TOXIC DILUTION ZONE.
    1.45     0.00     0.00      2.1 0.240E+01   0.30     1.89 .19915E+02
    1.50     0.00     0.00      2.1 0.244E+01   0.30     1.89 .20236E+02
    1.54     0.00     0.00      2.0 0.247E+01   0.30     1.89 .20573E+02
    1.58     0.00     0.00      2.0 0.250E+01   0.30     1.89 .20927E+02
    1.62     0.00     0.00      2.0 0.252E+01   0.30     1.89 .21301E+02
    1.67     0.00     0.00      2.0 0.254E+01   0.30     1.89 .21695E+02
    1.71     0.00     0.00      2.0 0.256E+01   0.30     1.90 .22113E+02
    1.75     0.00     0.00      1.9 0.257E+01   0.30     1.90 .22556E+02
    1.80     0.00     0.00      1.9 0.258E+01   0.30     1.90 .23028E+02
    1.84     0.00     0.00      1.9 0.259E+01   0.30     1.90 .23532E+02
    1.88     0.00     0.00      1.9 0.259E+01   0.30     1.90 .24073E+02
    1.92     0.00     0.00      1.9 0.260E+01   0.30     1.90 .24655E+02
    1.97     0.00     0.00      1.9 0.260E+01   0.30     1.90 .25284E+02
    2.01     0.00     0.00      1.9 0.260E+01   0.30     1.90 .25969E+02
    2.05     0.00     0.00      1.9 0.260E+01   0.30     1.91 .26718E+02
    2.10     0.00     0.00      1.9 0.260E+01   0.30     1.91 .27546E+02
    2.14     0.00     0.00      1.9 0.259E+01   0.30     1.91 .28467E+02
    2.18     0.00     0.00      1.9 0.259E+01   0.30     1.91 .29506E+02
    2.22     0.00     0.00      1.9 0.259E+01   0.30     1.91 .30694E+02
    2.26     0.00     0.00      1.9 0.258E+01   0.30     1.91 .31929E+02
 Cumulative travel time =          31.9294 sec  (     0.01 hrs)

END OF CORSURF (MOD310): BUOYANT SURFACE JET - NEAR-FIELD REGION
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** End of NEAR-FIELD REGION (NFR) **
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 WAKE FLOW CONDITIONS: The discharge velocity (U0) is less than or equal to the
 ambient velocity (Ua) and results in wake flow conditions. There is no discharge
 momentum induced mixing. The mixing characteristics are UNDESIRABLE.

 The initial plume WIDTH/THICKNESS VALUE in the next far-field module will be
  CORRECTED by a factor  0.45 to conserve the mass flux in the far-field!

 Some bank/shore interaction occurs at end of near-field.

 In the next prediction module, the jet/plume centerline will be set
   to follow the bank/shore.
--------------------------------------------------------------------------------
BEGIN MOD341: BUOYANT AMBIENT SPREADING

 Plume is ATTACHED to LEFT  bank/shore.
   Plume width is now determined from LEFT  bank/shore.

 Plume condition is non-buoyant or weakly buoyant, or, at the end of the NFR
   it is governed by full vertical mixing over the ambient depth,
   or by complete lateral mixing over the channel width.
 Thus, the BUOYANT SPREADING REGIME is ABSENT.

END OF MOD341: BUOYANT AMBIENT SPREADING
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BEGIN MOD361: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

  Vertical diffusivity (initial value)   = 0.489E-02 m^2/s
  Horizontal diffusivity (initial value) = 0.611E-02 m^2/s

 Profile definitions:
   BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
      = or equal to water depth, if fully mixed
   BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
        measured horizontally in Y-direction
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   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction efects, if any)
   TT = Cumulative travel time

 Plume Stage 2 (bank attached):
       X        Y        Z        S        C        BV       BH        TT
    2.26     0.00     0.00      1.9 0.258E+01   0.40     0.29 .31929E+02
 Plume interacts with BOTTOM.
 The passive diffusion plume becomes VERTICALLY FULLY MIXED within this
   prediction interval.
   17.40     0.00     0.00      5.1 0.979E+00   0.40     0.77 .58696E+02
   32.54     0.00     0.00      7.0 0.718E+00   0.40     1.06 .85462E+02
** WATER QUALITY STANDARD OR CCC HAS BEEN FOUND **
 The pollutant concentration in the plume falls below water quality standard
   or CCC value of 0.690E+00 in the current prediction interval.
 This is the spatial extent of concentrations exceeding the water quality
   standard or CCC value.
   47.67     0.00     0.00      8.4 0.594E+00   0.40     1.28 .11223E+03
   62.81     0.00     0.00      9.7 0.518E+00   0.40     1.46 .13899E+03
   77.95     0.00     0.00     10.7 0.465E+00   0.40     1.63 .16576E+03
   93.08     0.00     0.00     11.7 0.426E+00   0.40     1.78 .19253E+03
  108.22     0.00     0.00     12.7 0.395E+00   0.40     1.92 .21929E+03
  123.36     0.00     0.00     13.5 0.370E+00   0.40     2.05 .24606E+03
  138.49     0.00     0.00     14.3 0.349E+00   0.40     2.17 .27283E+03
  153.63     0.00     0.00     15.1 0.332E+00   0.40     2.29 .29959E+03
  168.77     0.00     0.00     15.8 0.316E+00   0.40     2.40 .32636E+03
  183.90     0.00     0.00     16.5 0.303E+00   0.40     2.50 .35312E+03
  199.04     0.00     0.00     17.2 0.291E+00   0.40     2.60 .37989E+03
  214.18     0.00     0.00     17.8 0.281E+00   0.40     2.70 .40666E+03
  229.32     0.00     0.00     18.4 0.272E+00   0.40     2.79 .43342E+03
  244.45     0.00     0.00     19.0 0.263E+00   0.40     2.88 .46019E+03
  259.59     0.00     0.00     19.6 0.255E+00   0.40     2.97 .48696E+03
  274.73     0.00     0.00     20.1 0.248E+00   0.40     3.06 .51372E+03
  289.86     0.00     0.00     20.7 0.242E+00   0.40     3.14 .54049E+03
  305.00     0.00     0.00     21.2 0.236E+00   0.40     3.22 .56726E+03
 Cumulative travel time =         567.2554 sec  (     0.16 hrs)

 Simulation limit based on maximum specified distance =    305.00 m.
   This is the REGION OF INTEREST limitation.

END OF MOD361: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT
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CORMIX3: Buoyant Surface Discharges                    End of Prediction File
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