**FACT SHEET**
**AND SUPPLEMENTARY INFORMATION**
**FOR GENERAL PERMIT**
**DISCHARGES FROM GROUNDWATER and SURFACE WATER CLEAN UP**
**LOCATED WITHIN THE STATE OF ARKANSAS**

1. **Background**

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 State of Arkansas has been authorized by the U. S. Environmental Protection Agency to administer the National Pollutant Discharge Elimination System (NPDES) Program in Arkansas, including the issuance of general permits to categories of dischargers under the provisions of 40 CFR 122.28, as adopted by reference in Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation No. 6.104. Under this authority, ADEQ may issue a single general permit to a category of point sources located within the same geographic area whose discharges warrant similar pollution control measures. Specifically, in accordance with 40 CFR 122.28, the ADEQ is authorized to issue a general NPDES permit if there are a number of point sources operating in a geographic area that:

1.1. involve the same or substantially similar types of operations;
1.2. discharge the same types of wastes;
1.3. require the same effluent limitations or operating conditions;
1.4. require the same or similar monitoring requirements; and
1.5. in the opinion of the Director, are more appropriately controlled under a general permit than under individual permits.

The violation of any condition of a general permit constitutes a violation of the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 *et seq*.) and may subject the discharger to the penalties and revocation of coverage under the general permit. Upon issuance of the final general permit for this type of discharge, operators that are considered qualified for coverage under this general permit must submit a written notice of intent to the Director for coverage under the general permit.

**2011 Permit**

The previous permit became effective on April 1, 2011 and expires on March 31, 2016 and the Department is proposing to renew this general permit. The reissuance of this General Permit will replace the 2011 and the new permit number will remain as ARG790000. There are currently 8 facilities covered under this General Permit.

The 2016 Groundwater and Surface Water Cleanup Discharge General Permit, ARG790000, is required by Arkansas law to be issued 180 days prior to the expiration date of the 2011 Groundwater Cleanup Discharge General Permit (i.e. September 30, 2015).

Therefore, existing permittees will have 180 days from the effective date of this renewal permit to apply for coverage. The Department believes that the 180 day period prior to the effective date will give permittees enough time to become familiar with new requirements in order to comply with the 2016 Groundwater Cleanup Discharge General Permit.

**Discharge the Same Types of Waste**

The majority of the discharges to be covered under this permit will contain one or more pollutants from common chemical groups, such as suspended solids, total petroleum hydrocarbons (TPH), Benzene, Polycyclic

Aromatic Hydrocarbons (PAHs), and metals. Petroleum related cleanup sites include those contaminated primarily with fuel oils such as gasoline, diesel, aviation fuel, kerosene and heating oil.

**Petroleum Related Site Remediation Activities**

This general permit authorizes new or existing discharges to surface waters of the State of Arkansas from any conveyance used for collecting and conveying treated wastewater which is directly related to a ground water petroleum remediation system.

ADEQ is proposing to re-issue this general permit for point source discharges related primarily to the discharge of groundwater and related surface waters from two (2) general categories of activities:

**Gasoline-Only Sites**: The general permit is designed to cover discharges resulting from the treatment of contaminated groundwater and remediation related wastewater where only gasoline was released.

**Fuel Oils and Other Oil Sites:** The general permit is designed to cover discharges resulting from treatment of contaminated groundwater and remediation related wastewater where there has been a release of fuel oils such as kerosene, diesel fuel, and heavier residual fuel oils, and other products, with the exception of waste oil.

**Expected of Dischargers Covered by this Permit**

Discharges from the activities listed above typically contain common pollutants or groups of pollutants such as Total benzene, toluene, ethylbenzene, & xylenes (BTEX), Benzene, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), nickel, chromium, zinc, iron, Benzo(a)Pyrene (BaP), and Total Suspended Solids (TSS). EPA has evaluated the potential for such discharges based on many years of discharge monitoring reports from over 2,000 sites, as well as data from other states' NPDES permit programs, federal and state managed Superfund type programs, Underground Storage Tank (UST), and Drinking Water programs. Therefore, certain pollutants from the above list will be included in this permit. In lieu of inclusion of other pollutants such as Iron or metals, WET testing has been changed from monitoring and reporting to not less than 100% of effluent in order to comply with Reg. 2.409 for pollutants that could be in the discharge and not covered by the permit due to different hardness and pH for different ecoregions.

This permit establishes effluent limitations and the permittee must ensure the application of best management practices (BMPs) to the overall activity to minimize the environmental impacts of the activity and the discharge to the environment. ADEQ does not prescribe specific technologies required to meet the discharge requirements. The information provided here is meant to demonstrate that, in most instances, the contaminants found in these discharges can be successfully and economically managed through treatment. In instances where discharges include chemicals other than the pollutant of concerns (POCs) covered by this permit or where applicants encounter particularly difficult pollutant control situations, the operator will need to submit an application for an individual NPDES permit.

In summary, after properly filing a Notice of Intent (NOI) under Part 1.4 of the permit, facilities that are eligible for coverage under this general permit, will receive a Notice of Coverage (NOC), with a tracking number starting with ARG79, and a copy of the permit for the facility. The NOC includes the Department's determination that a facility is covered under this general permit and may specify alternate requirements outlined in the permit, such as modified sampling frequencies for certain parameters or the inclusion of monitoring for parameters in addition to those requiring regular monitoring.

## 2. Summary of Major Changes from the Previous Permit

2.1 Clarification for coverage under this general permit in Part 1.2 under Eligibility and Authorization has been made as follows:

This general permit authorizes new or existing discharges to surface waters of the State of Arkansas from any conveyance used for collecting and conveying treated wastewater which is directly related to a ground water petroleum remediation site. For the purposes of this permit, only sites dealing with dewatering from underground petroleum storage tank activities, including dewatering from installation of petroleum tanks, dewatering of excavation related to surface cleanup of spill or leak from gas stations, convenience stores, truck stops, or petroleum storage facilities, are eligible for this permit.

2.2 Inclusion of state construction permit requirements in this General Permit (Part 1.2.4) consistent with Regulation No. 6.202. This is to reduce the number of permits issued to new facilities.

2.3 Existing dischargers must submit an NOI and all necessary information stated in Part 1.4 of the Permit no later than the expiration date of the 2011 general permit (Part 1.4.5.1).

2.4 Section 6.7 of the 2011 permit, Duty to Re-apply, has been covered by Section 1.4.5 of the 2016 permit.

2.5 Changed deadline for application for new dischargers (Part 1.4.4) from 30 days prior to the date of desired permit coverage to 90 days prior to the date of desired permit coverage to allow time for the review of the construction of the treatment system.

2.6 Public Notice requirements have been added (Part 1.5). Since there is no 30-day public notice in the newspaper for General Permits and the citizens do not have a chance to comment on the Notice of Intent (NOI) received by the Department for a specific facility, the Department made a determination to do a 5-day public notice on the ADEQ website based on citizens' comments and concern received from the public during the renewal of another general permit (ARG550000). The Department has made a decision to include this requirement in all general permits during the next renewal cycle.

2.7 Monitoring requirements for Benzo(a)pyrene and Total Polynuclear Aromatic Hydrocarbons (PAH) were added. PAH are indicator compounds for diesel range organics. Benzo(a)pyrene is a type of PAH and is regulated under the Safe Drinking Water Act. According to EPA, Maximum Contaminant Levels (MCLs) are enforceable standards that set forth the maximum permissible level of a contaminant allowed in drinking water, and an MCL has been developed for benzo(a)pyrene. The MCL for benzo(a)pyrene is 0.2 ppb (40 CFR 141.61(c)). The limit (daily maximum) for total PAH is 10 µg/L, based on equivalent general permits in other states, including Louisiana, Texas, New Hampshire, and Massachusetts. The 16 PAHs that make up the parameter Total PAH are from the list of priority pollutants of the Clean Water Act, which can be found in Appendix A to 40 CFR 423.

2.8 Re-opener Clause was added (Part 3.12).

2.9 Part 7.1.4.3 of the permit was changed to require six months of WET testing with no toxicity found before requesting a reduction in testing frequency (previously required three months of testing with no toxicity). A six-month time frame will better incorporate any variations due to seasonality.

2.10 A definition for "reservoir" was added (Part 8.23).

2.11 WET testing has been changed from monitoring and reporting to not less than 100% of effluent in order to comply with Reg. 2.409 for pollutants that could be in the discharge and not covered by the permit due to different hardness and pH for different ecoregions (i.e. metals).

2.12 Total suspended solids (TSS) limits have been included.

2.13 Monthly average limits for the pollutants have been calculated based on TSD.

2.14 BMP requirements have been included (see Part 7.5 of the permit).

2.15 TPH limits have been changed to correct the daily max and monthly average.

## 3. Rationale for Effluent Limitations and Standards

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.

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 permit, ADEQ conducted a review to determine whether the TBELs from the 2011 Permit were still appropriate. Based on the ADEQ's review, and as provided in Section 402(a)(1) of the CWA, the ADEQ proposes to retain, or adjust as necessary, the TBELs from the 2011 Permit. The ADEQ reviewed the following:

- Existing state groundwater remediation permit and factsheet ARG790000;
- Existing Discharge Monitoring Reports (DMRs) submitted by the facilities currently covered by 2011 Permit;
- EPA's National Primary Drinking Water Regulations - Maximum Contaminant Levels (MCLs);
- ELGs from the Oil Treatment and Recovery Category (40 CFR 437.20) and the Organic Chemicals, Plastics and Synthetic Fibers Category (40 CFR 414);
- Idaho General Permit IDG910000;
- Draft Indiana Groundwater Petroleum Remediation Systems General Permit ING080000;
- EPA Region 1 remediation of ground water fact sheet;
- Technical Support Document for Water Quality-based Toxics Control, [TSD (EPA-505-2-90-001, March 1991)];
- U.S. Environmental Protection Agency. 2003. "Drinking Water Contaminants;"
- Other States GP (Michigan, Pennsylvania, West Virginia, Alaska, Texas, Louisiana, Rhode Island, and others).

**Approach to Development of Effluent Limitations:** In conducting research to develop this renewal general permit, ADEQ noted that there are very few precedents for general permits similar in scope to this permit. However, there are a number of States that have issued remediation discharge permits for petroleum related cleanups. A few States have included other pollutants such as Carbon Tetrachloride, 1,2 Dichloroethane, Tetrachloroethylene, 1,1,2 Trichloroethane, Trichloroethylene, Vinyl Chloride, Bis (2-Ethylhexyl) Phthalate, Arsenic, Iron, and Metals. All of the permits researched have fairly similar requirements including the selection of discharge parameters. The effluent limitations vary somewhat primarily due to differing state requirements and standards. Treatment technologies are all similar to those described in this Fact Sheet.

EPA developed a model general permit for gasoline site cleanup discharges in 1989. Also, Rhode Island has issued general permits for gasoline only and fuel oil cleanups similar to Arkansas. Other permits reviewed included those developed by EPA Regions IV and VI, and the States of Idaho, Indiana, Michigan, Pennsylvania, West Virginia, Alaska, Texas, and Louisiana, which are all primarily petroleum related permits.

The pollutant limits in this permit represent a mix of technology- based effluent limitations (e.g. PAH, Benzene) and water quality-based effluent limitations (e.g. pH).

Since there are no national effluent limitation guidelines for the categories of discharges covered by this general permit, ADEQ has used Best Professional Judgment by reviewing the Discharge Monitoring Reports (DMRs) of permitted facilities in Arkansas and other states and EPA permits for these type discharges as well as the current MCLs and Human Health based standards established for each compound to establish the effluent limits. Documents which were reviewed are listed above.

In establishing effluent limitations, many POC values were derived from existing standards, such as drinking water "maximum contaminant levels" or MCLs, Human Health Criteria, or Water Quality standards (WQS). Certain pollutants or classes of pollutants may be more toxic than others, but the absence of an indicator chemical can ensure that other chemicals with similar characteristics will also be absent. For example, benzene is often used as an indicator compound in the control of the volatile organic compounds (e.g., toluene, ethylbenzene, and xylenes) in gasoline and other gasoline constituents (see EPA's model permit for cleanup of gasoline releases - 1989) due to its chemical characteristics and behavior when available control methods are used.

When ADEQ reviews the Notice of Intent (NOI) for discharges under this permit and determines that there are unusual circumstances where Human Health criteria based limits or MCLs are needed for these compounds, ADEQ may require the applicant to seek an individual permit.

For a mixed effluent with pollutants that include petroleum hydrocarbons and industrial solvents, there may also be low levels of one or more metals present in the groundwater. The primary concern of the groundwater remediation is removing the BTEX and PAHs using standard treatment such as carbon adsorption. The low levels of metals in the groundwater would be a secondary concern and to further reduce the concentrations at zero dilution could require significant additional expense and complexity of the treatment system. For this reason, ADEQ made a decision to include a Whole Effluent Toxicity limit of not less than 100% instead of monitoring and reporting for all other toxic pollutants such as metals. With this condition, no additional expense and treatment system will be required by the permittee.

This Draft permit 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, ADEQ does not prescribe specific technologies required to meet the effluent requirements. Technology Based Effluent Limitations and Basis [in Micrograms per Liter (µg/L) Unless Noted Otherwise].

| Parameter | AML | MDL | Basis for TBEL |
|---|---|---|---|
| Total Petroleum Hydrocarbons (TPH) | 3.4 mg/L | 5 mg/L | Monitoring data, MCL, TSD, other GPs, 40 CFR 122.44(l) |
| Benzene | 3.4 | 5 | Monitoring data, MCL, TSD, other GPs, 40 CFR 122.44(l) |
| Benzo(a)Pyrene (BaP) | 0.14 | 0.2 | MCL, TSD, 40 CFR 141.61(c), EPA document in source 20.18 of this Fact Sheet |
| Total BTEX | 68.5 | 100 | Monitoring data, MCL, TSD, other GPs, 40 CFR 122.44(l) |
| Total Polynuclear Aromatic Hydrocarbons (PAH) | 6.7 | 10 | Monitoring data, MCL, TSD, other GPs, 40 CFR 423 |
| TSS | 35 mg/L | 53 mg/L | Other GPs, and Reg. 2.408 |
| pH | 6.0 s.u. – 9.0 s.u. | | Reg. 2.504 and 40 CFR 122.44(l) |
| Acute WET | Not < 100% | | Previous Permit, Reg. 2.409, Reg. 2.508, CPP |

### 3.1 Water Quality-Based Effluent Limitations

For the majority of the effluent pollutants proposed to be limited in this Draft permit, 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 or activated carbon, can achieve effluent concentrations at laboratory reportable values (often referred to as "non-detection" levels in lab reports).

Water quality-based effluent limitations (WQBELs) are designed to protect water quality by ensuring that WQS (narrative and numerical) 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)].

All discharges to surface waters in Arkansas must comply with state WQS, including the state's antidegradation policy.

**pH**

The pH of discharge water is an indicator of the relative acidity or alkalinity of that water. The State has established numeric water quality criteria for pH for classes of surface water to protect sensitive species. It has been common practice for EPA and the States to establish effluent limitations for pH equal to the ranges (low-high) established for the class of receiving water. pH limits are based on Reg. 2.504 and the previous permit (40 CFR 122.44(l)).

**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 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 stormwater.

ADEQ 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 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 permit includes the Maximum Daily limit of 53 mg/L based on other ADEQ general permits such as Hydrostatic Testing Permit (ARG670000) and Aggregate Facilities (ARG500000) and sets an Average Monthly limit of 35 mg/L using the 1991 EPA TSD methodology to translate from MDLs to AMLs.

**Effluent Limits for TSS – For All Receiving Waters**
**AML = 35 mg/L**
**MDL = 53 mg/L**

**Acute Whole Effluent Toxicity (WET) Limit:**

Whole Effluent Toxicity Testing (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 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 permit contains WET testing limit requirements. The requirements specify testing frequency and methods, quality assurance responsibilities, and reporting protocols.

ADEQ made a decision instead of including all metal limits with lowest hardness of 25 mg/L, which would be expensive and require additional treatment systems, based on Reg. 2.508, to change the WET reporting to not less than 100% effluent limits in order to meet Reg. 2.409 and Reg. 2.508 (No toxics in toxic amounts).

### 3.2 Technology-Based Effluent Limits

The following TBLs have been included in the permit in order to meet Reg. 2.409.

**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 this permit. 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 this General 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.

In establishing the proposed effluent limit for TPH, ADEQ reviewed a number of sources including monitoring data being submitted pursuant to approved site remediation projects, and other EPA and state issued general permits. In general, ground water cleanup permits 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, ADEQ is proposing to retain the 2011 permit technology-based TPH Maximum Daily Limitation of 5.0 mg/L. And, using the TSD methodology, ADEQ 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**

**Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)**

Background for selection of BTEX and Benzene:

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). 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. 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. In addition, a WET limit of 100% in lieu of other pollutants has been included in the permit to make sure that there is no discharge of toxics in toxic amounts to the waters of the state.

**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 maximum 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 NPDES Permit* and the observed performance of control equipment at historical or existing cleanup sites submitting DMRs, ADEQ is retaining the technology-based Maximum Daily limit of 100 µg/L from the existing 2011 permit and using the TSD methodology, ADEQ calculated the AML to be 68.5 µg/L.

**Effluent Limits for Total BTEX –For All Receiving Waters**
**AML = 68.5 µg/L**
**MDL = 100 µg/l**

**Benzene Limits:**

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 to meet Reg. 2.409, and will ensure adequate control of the majority of the many other volatile gasoline constituents.

The most commonly used technology based limit for benzene is 5.0 µg/L, which is also the current Maximum Contaminant Level (MCL) set limiting benzene in drinking water. ADEQ is retaining the technology-based Maximum Daily limit of 5 µg/L from the existing 2011 permit and using the TSD methodology, ADEQ calculated the AML to be 3.4 µg/L.

**Effluent Limits for Benzene – For All Receiving Waters**
**AML = 3.4 µg/L**
**MDL = 5.0 µg/L**

**Polycyclic Aromatic Hydrocarbons (PAH)**

PAH include a large group of organic compounds that have similar chemical structures and chemical characteristics. They are found in 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. PAH compounds are also reported at many contaminated construction dewatering sites. EPA has listed 16 PAH compounds as priority pollutants under the CWA, seven of which have been identified as probable carcinogens. Accordingly, the PAH have been divided into two separate groups: Group I: Carcinogenic PAH: Benzo(a)Anthracene, Benzo(a)Pyrene, Benzo(b)Fluoranthene, Benzo(k)Fluoranthene, Chrysene, Dibenzo(a,h)Anthracene, Indeno(1,2,3-cd) Pyrene, and Group II: Non Carcinogenic PAH: Acenaphthene, Acenaphthylene, Anthracene, Benzo(ghi)-Perylene, Fluoranthene, Fluorene, Phenanthrene, and 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.

Monitoring requirements for PAH were added for facilities discharging diesel contaminated groundwater and surface water. PAHs are indicator compounds for diesel range organics. The daily maximum for total PAH is 10 µg/L, based on equivalent general permits in other states, including Louisiana, Texas, New Hampshire, and Massachusetts. The 16 PAHs that make up the parameter Total PAHs are from the list of priority pollutants of the Clean Water Act, which can be found in Appendix A to 40 CFR 423.

The most commonly used technology based limit for PAH is 10.0 µg/L. ADEQ is retaining the technology-based Maximum Daily limit of 10µg/L and using the TSD methodology, ADEQ calculated the AML to be 6.7 µg/L.

**Effluent Limits for PAH– For All Receiving Waters**
**AML = 6.7 µg/L**
**MDL = 10.0 µg/L**

**Benzo(a)pyrene:**

Benzo(a)pyrene is one of a group of compounds called polycyclic aromatic hydrocarbons. They are not produced or used commercially but are very commonly found since they are formed as a result of incomplete combustion of organic materials.

The major source of benzo(a)pyrene in drinking water is leaching from storage tanks and distribution lines. The following treatment method(s) have proven to be effective for removing benzo(a)pyrene to below 0.0002 mg/L (0.2 µg/l) by activated carbon. The MCL for benzo(a)pyrene is 0.2 ppb (40 CFR 141.61(c)).

The most commonly used technology based limit for benzo(a)pyrene is 0.2 µg/L. ADEQ is retaining the technology-based Maximum Daily limit of 0.2 µg/L and using the TSD methodology, ADEQ calculated the AML to be 0.14 µg/L.

**Effluent Limits for benzo(a)pyrene – For All Receiving Waters**
**AML = 0.14 µg/L**
**MDL = 0.2 µg/L**

**4. Mass Limits:**

The federal NPDES regulation found at 40 CFR 122.45(f) requires that effluent limitations be expressed in terms of mass, if possible.

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 this permit 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 permit includes concentration based effluent limits only. 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. No mass limits have been included.

**5. Concentration Limits (Monthly average and daily max):**

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 permit 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. In the existing permit both AMLs and MDLs are the same. However, Using the procedures in the Technical Support Document for Water Quality-based Toxics Control, [TSD (EPA-505-2-90-001, March 1991)], Section 5.4.2 [" … permit writer typically divide, the MDL by 1.5 or 2.0 to drive an AML …"], the monthly average limits for the following pollutants have been revised as follows:

Total Petroleum Hydrocarbons (TPH)
MDL = 5 mg/L AML = 5/1.5 = 3.4 mg/L

Benzene
MDL = 5 ug/L AML = 5/1.5 = 3.4 ug/L

Total BTEX
MDL = 100 ug/L AML = 100/1.5 = 68.5 ug/L

**6. Time Frame for Submitting an NOI**

**Existing dischargers** must submit an NOI and all necessary information stated in Part 1.4 of the Permit no later than the expiration date of the 2011 general permit (Part 1.4.5.1).

**New Dischargers** shall submit an NOI and all necessary information for permit coverage 90 days prior to the date of desired permit coverage to allow time for the review of the construction of the treatment system.

**7. Information Required for the NOI**

Pursuant to 40 CFR 122.28 the NOI must include certain information in order to receive authorization to discharge under this permit. The NOI requirements are found in Part 1.4.2 of the Draft Permit.

A standardized form can be accessed on the ADEQ website once the final permit is issued. The form could also be submitted electronically through e-portal.

**8. Facilities Excluded from Coverage**

Section 1.3 of the permit has all federal and state requirements for the facilities that are excluded from this permit.

**9. 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 Permit (2016 permit) will expire five years from the effective date of the final permit.

The 2016 Groundwater and Surface Water Cleanup Discharge General Permit, ARG790000, is required by Arkansas law to be issued 180 days prior to the expiration date of the 2011 Groundwater Cleanup Discharge General Permit.

Therefore, existing permittees will have 180 days from the effective date, to apply for coverage. The Department believes that the 180 day period prior to the effective date will give permittees enough time to become familiar with new requirements in order to comply with the 2016 Groundwater Cleanup Discharge General Permit.

**10. 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 permit.

The Draft permit in Part 7.5 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 State through best management practices. This includes, but is not limited to, material storage areas, site runoff, stormwater, 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.

**11. Use of Chemical Additives**

Chemical agents are commonly utilized for enhancement of wastewater treatment, for the control of undesirable conditions caused during treatment, or due to the chemical makeup of the water being treated. For example, chemical additives are used to control foaming, algae and bacteria growth, and are added to control “naturally occurring” dissolved iron or other minerals in groundwater which may foul treatment systems, discolor the discharge, or cause sediments in the receiving water. While many additives are advertised as being “non-toxic” or “biodegradable,” there are instances where specific compounds in the additive may be unacceptable for discharge to certain receiving waters.

Typically ADEQ has required the Material Safety Data Sheets (MSDS) for the proposed product to be submitted for review prior to approving chemical additives. When filing the NOI for coverage under this permit, the operator must identify the chemical additives being used or proposed to be used, the purpose of use of the additive, and

attach the MSDS sheet(s) for the additive(s). ADEQ may request further information regarding the chemical composition of the additive, potential toxic effects, or other information to ensure that approval of the use of the additive will not cause or contribute to a violation of state water quality standards.

Approval of coverage under this permit will constitute approval of the use of the chemical additive(s) that are described in the Notice of Intent (NOI). If coverage of the discharge under this permit has already been granted and the use of a chemical additive becomes necessary, the operator must submit a modification of Notice of Change (NOC).

**12. Anti-Backsliding**

Effluent limits, monitoring requirements, and monitoring frequencies for flow, TPH, Benzene, Total BTEX, pH, and Acute WET for discharge of treated contaminated groundwater and surface water in Part 2 of the permit are continued from the current permit based on EPA anti-backsliding regulations [40 CFR 122.44(l)]. Effluent limits, monitoring requirements, and monitoring frequencies for TSS and PAHs as well as WET limit of not less than 100% are new limits in this permit.

This permit is consistent with the requirements to meet Anti-backsliding provisions of the Clean Water Act (CWA), Section 402 (o) [40 CFR 122.44(l)]. The final effluent limitations for reissuance permits must be as stringent as those in the previous permit, unless the less stringent limitations can be justified using exceptions listed in 40 CFR 122.44(l)(2)(i).

**13. Permit Expiration**

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

**14. Monitoring and Reporting Requirements**

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 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 ADEQ. Permittees must analyze water samples using a sufficiently sensitive EPA approved analytical method (40 CFR 136).

**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 (40 CFR 136) or as specified in the permit. Monitoring frequency of the pollutants is continued from the previous issued permit. All new pollutants monitoring frequency have been set similar to the existing pollutants.

**15. Standard Permit Provisions**

Specific regulatory management requirements for NPDES permits are contained in 40 CFR 122.41. Conditions in Parts 2 through 4 are incorporated in the permit based on 40 CFR 122.41, 40 CFR 122.43, 40 CFR 122.62, 40 CFR 124.5, 40 CFR 136, 40 CFR 122.44(d), 40 CFR 122.44(l), Appendix D of the Continuing Planning Process (CPP), APC&EC Regulation No. 2, and APC&EC Regulation No. 3 in order to provide and ensure compliance with all

applicable requirements of the CWA and regulations. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

**16. 303 (d) List Waters and TMDL**

Upon issuance of this permit, all existing and new dischargers will be subject to review to determine whether the discharge is to a segment of a receiving water which is water quality "impaired" or "limited". Under Section 303(d) of the CWA, the States are periodically required to list all State waters that are not currently meeting their water quality standards. These waters are considered "impaired". States may also be required to develop a "Total Maximum Daily Load" or TMDL for a waterbody which is a mathematical approach to allocating pollutant loads among a number of dischargers along impaired water, the sum of which is less than the maximum load allowed to ensure the standards are met. A water where a TMDL is available or planned is considered water quality limited. The adopted water quality standards, approved by EPA, for WLA are contained in the WQMP.

The CWA Section 303(d) list for each State provides information on the water body or segment of a waterbody which is impaired along with the pollutant or class of pollutants for which the water is listed. Waters can also be listed for failing to meet minimum flow requirements to support a balanced species population. As part of the Notice of Intent for coverage under this permit, applicants will be required to determine whether the proposed receiving water or segment has been listed on the state's 303(d) list and whether any pollutant proposed to be discharged is indicated as a cause for listing.

ADEQ anticipates that due to the nature of the contaminants regulated by this permit, discharges proposed to impair receiving waters typically will not be the same contaminants causing the impairment (e.g. those causing low dissolved oxygen, nutrients, etc.). ADEQ further believes that compliance with the effluent limitations in this permit will not cause or significantly add to violation of any state water quality standard.

Additionally, 40 CFR Section 122.4(i) requires a new discharger to demonstrate compliance with this section for any TMDL which has been completed for the water quality-limited segment. Applicants will be required to indicate on the NOI whether a TMDL has been prepared and for which parameters. However, ADEQ believes that only in rare instances will the contaminants of concern covered by this permit be subject to a TMDL.

Further information regarding the ADEQ 303(d) listings, TMDLs, and water quality standards for receiving waters can be obtained from the state's website.

**17. Public Notice**

The public notice describes the procedures for the formulation of the draft decision and shall provide for a public comment period of 30 days in accordance with APC&EC Regulation No. 8. During this period, any interested persons may submit written comments on the draft permit and may request a public hearing to clarify issues involved in the permitting decision.

A copy of the permit and public notice will be sent via email to the Corps of Engineers, the Regional Director of the U.S. Fish and Wildlife Service, the Department of Arkansas Heritage, the EPA, and the Arkansas Department of Health.

**18. Economic Impact**

This permit does not place any additional undue burden on any private business entity, large or small. It does not restrict any opportunities that are available to any small businesses. The inspection and control requirements are set

at a level to protect water quality while minimizing the resources required for compliance.

The permit fee of $500 is allowed by APC&EC Regulation No. 9 for commercial facilities. If a construction authorization is also required under this permit, an additional $500 fee will be required based on APC&EC Regulation No. 9.402(A). This permit incorporates construction requirements into the ARG790000. Previously, facilities were required to obtain both the ARG790000 (with a permit fee of $500) and a state construction permit (with a permit fee of $500); so the inclusion of the construction requirements into the ARG790000 does not change the required amount of permit fees. The construction requirements listed in Part 1.4.3 are consistent with the minimum requirements for a State Construction Permit and will not have any additional economic impact.

There may be minimal additional cost for facilities to obtain a Certificate of Good Standing from the Secretary of State of any State other than Arkansas. In most cases, the currently permitted treatment systems can meet the permit requirements. The cost of the treatment system is derived based on the contaminant level. The additional sampling requirements for TSS, BaP, and PAHs for discharges of treated contaminated groundwater may require an additional cost of approximately $105-$300. ADEQ believes that the inclusion of monitoring for BaP, PAHs, and TSS is necessary to adequately assess facility compliance with the permit limits. However, facilities benefit from cost savings through this general permit, which does not require sampling of individual parameters. Instead, pollutants of concern are largely sampled through indicators (BTEX) or classes of pollutants (e.g., TPH, PAH) and WET testing. This permit removed the requirements to sample for individual PAHs and metals. Overall, there should not be any increased economic impact for permittees discharging treated groundwater/surface water by obtaining this permit.

## 19. Contact Information

For additional information regarding this permit, please contact the General Permits Section of the Water Division:

John Bailey, P.E.
Permits Branch Manager, Water Division
5301 Northshore Drive
North Little Rock, AR 72114
Phone: 501-682-0623
water-permit-application@adeq.state.ar.us

## 20. Sources

20.1 APC&EC Reg. No. 2.
20.2 APC&EC Reg. No. 3.
20.3 APC&EC Reg. No. 6 which includes Title 40 Code of Federal Regulations adapted verbatim by ADEQ in Reg. 6.104.
20.4 APC&EC Reg. No. 8.
20.5 APC&EC Reg. No. 9.
20.6 2004 Edition of Recommended Standards for Wastewater Facilities (10 State Standards).
20.7 Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 *et seq*.).
20.8 40 CFR 122.
20.9 40 CFR 124.
20.10 40 CFR 136.
20.11 40 CFR 141.
20.12 40 CFR 423.
20.13 40 CFR 414.
20.14 40 CFR 437.
20.15 Appendix D of the Continuing Planning Process (CPP).
20.16 ARG790000 existing permit (2011 Permit).

20.17 Other States General Permit (Idaho, Indiana, Michigan, Pennsylvania, West Virginia, Alaska, Texas, Louisiana, and Rhode Island).
20.18 http://water.epa.gov/drink/contaminants/basicinformation/benzo-a-pyrene.cfm
20.19 EPA. 1989. Model NPDES Permit for Discharges Resulting From the Cleanup of Gasoline Released From Underground Storage Tanks. Office of Water. June 1989. http://www.epa.gov/npdes/pubs/owm0236.pdf
20.20 EPA. 1991. Technical Support Document for Water Quality-Based Toxics Control. U.S. Environmental Protection Agency, Office of Water, EPA/505/2-90-001, March 1991. http://water.epa.gov/scitech/datait/models/upload/2002_10_25_npdes_pubs_owm0264.pdf
20.21 EPA. 2012. 2012 Edition of the Drinking Water Standards and Health Advisories. U.S. Environmental Protection Agency, EPA-822-S-12-001, April 2012. http://water.epa.gov/action/advisories/drinking/upload/dwstandards2012.pdf
20.22 Agency for Toxic Substances and Disease Registry. Public Health Statement: Polycyclic Aromatic Hydrocarbons (PAHs). http://www.atsdr.cdc.gov/ToxProfiles/tp69-c1-b.pdf
20.23 Existing Discharge Monitoring Reports (DMRs) submitted by the facilities currently covered by 2011 Permit.
20.24 Idaho General Permit IDG910000.
20.25 Draft Indiana Groundwater Petroleum Remediation Systems General Permit ING080000.
20.26 Technical Support Document for Water Quality-based Toxics Control, [TSD (EPA-505-2-90-001, March 1991)].