



**U.S. ENVIRONMENTAL PROTECTION AGENCY  
UNDERGROUND INJECTION CONTROL PERMIT: CLASS I  
Permit Number AK-1I004-B**

In compliance with provisions of the Safe Drinking Water Act (SDWA), as amended, (42 U.S.C. 300f-300j-9), and attendant regulations incorporated by the U.S. Environmental Protection Agency (EPA) under Title 40 of the Code of Federal Regulations, BP Exploration (Alaska) Inc. (BPXA) (Permittee) is authorized to inject non-hazardous industrial waste utilizing up to three (3) Class I injection wells at the Prudhoe Bay Unit (PBU) Pad-3 disposal facility (adjacent to the PBU Drill Site-6) and located on the Alaskan North Slope (NS). Injection is authorized into the Sagavanirktok Formation, in accordance with Title 40 C.F.R. § 144.33 and the conditions set forth herein. The PBU is operated by BPXA and the other co-owners include ExxonMobil, ConocoPhillips, and Chevron. The Pad-3 Oily Waste Disposal Facility, referred to as Pad-3, has been in operation since 1976. The facility and associated wells were initially permitted with the EPA in August 1989 to inject Class I non-hazardous industrial waste, and the permit was renewed under EPA Permit No. AK-1I004-A in December 1999. The existing and proposed disposal well(s) are in an area where there are no underground sources of drinking water (USDWs) as determined by EPA as part of the 1989 permit issuance. Injection of hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA), as amended, (42 USC 6901) or radioactive wastes (other than naturally occurring radioactive material – NORM from pipe scale and sludge) are not authorized under this permit. All references to Title 40 of the Code of Federal Regulations are to regulations that are in effect on the date that this permit is issued. Figures and appendices are referenced to BPXA's Pad-3 Underground Injection Control (UIC) Class I Permit Renewal Application dated June 30, 2009 (Renewal Application).

This permit renewal shall become effective on December 8, 2009, in accordance with 40 C.F.R. § 124.15. This permit and the authorization to inject shall expire at midnight, December 7, 2019, unless terminated.

Signed this \_\_3rd\_\_ day of September 2009.

\_\_\_\_\_/s/ Sept 3, 2009\_\_\_\_\_  
Edward J. Kowalski, Director  
Office of Compliance and Enforcement  
U.S. Environmental Protection Agency  
Region 10 (OCE-164)  
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## PART I

### GENERAL PERMIT CONDITIONS

#### A. EFFECT OF PERMIT

The Permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 C.F.R. Part 141 or may otherwise adversely affect the health of persons or the environment.

Compliance with this permit during its term constitutes compliance for purposes of enforcement with Part C of the Safe Drinking Water Act (SDWA). Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, or any other law governing protection of public health or the environment from imminent and substantial endangerment to human health or the environment.

This permit may be modified, revoked and reissued, or terminated during its term for cause. Issuance of this permit does not convey property rights or mineral rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. This permit does not authorize any above ground generating, handling, storage, or treatment facilities.

This permit is based on the application for renewal and related materials submitted by BPXA dated June 30, 2009.

#### B. PERMIT ACTIONS

##### 1. Modification, Reissuance, or Termination

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 C.F.R. §§ 144.39 and 144.40. In addition, the permit can undergo minor modifications for cause as specified in 40 C.F.R. § 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition.

##### 2. Transfer of Permits

This permit is not transferable to any person except after notice to the Director on APPLICATION TO TRANSFER PERMIT (EPA Form 7520-7) and in accordance with 40 C.F.R. § 144.38. The Director may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the SDWA.

#### C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

#### D. CONFIDENTIALITY

In accordance with 40 C.F.R. Part 2, any information submitted to EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed in 40 C.F.R. § 2.203 and on the application form or instructions, or, in the case of other submissions, by stamping the words "confidential" or "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 C.F.R. Part 2 (Public Information).

Claims of confidentiality for the following information will be denied:

1. The name and address of the Permittee.
2. Information that deals with the existence, absence, or level of contaminants in drinking water.

## **E. GENERAL DUTIES AND REQUIREMENTS**

### 1. Duty to Comply

The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application; except that the Permittee need not comply with the provisions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit under 40 C.F.R. § 144.34.

### 2. Penalties for Violations of Permit Conditions

Any person who violates a permit condition is subject to civil penalties, fines, and other enforcement action under SDWA and may be subject to such actions pursuant to RCRA. The current fine limit is \$37,500 per day of violation and/or being imprisoned for up to three (3) years. Any person who willfully violates permit conditions may be subject to criminal prosecution.

### 3. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. To be timely, a complete application for a new permit must be received at least 180 days before this permit expires.

### 4. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

### 5. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit

### 6. Proper Operation and Maintenance

The Permittee shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

### 7. Duty to Provide Information

The Permittee shall provide to the Director, within a reasonable time, any information that the Director may request to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The Permittee shall also provide to the Director, upon request, copies of records required to be kept by this permit.

### 8. Inspection and Entry

The Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

- a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;

- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by SDWA, any contaminants or parameters at any location.

9. Records

- a. The Permittee shall retain records and all monitoring information, including all calibration and maintenance records for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete this permit application for a period of at least three years from the date of the sample, measurement, report or application. These periods may be extended by request of the Director at any time. Calculated flow rates are acceptable as a backup system if the primary automated instrumentation system malfunctions.
- b. The Permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of plugging and abandonment. At the conclusion of the retention period, if the Director so requests, the Permittee shall deliver the records to the Director. The Permittee shall continue to retain the records after the three-year retention period unless he delivers the records to the Director or obtains written approval from the Director to discard the records.
- c. Records of monitoring information shall include:
  - (1) The date, exact place, and time of sampling or measurements;
  - (2) The name(s) of the individual(s) who performed the sampling or measurements;
  - (3) The date(s) analyses were performed;
  - (4) The name(s) of the individual(s) who performed the analyses;
  - (5) The analytical techniques or methods used; and
  - (6) The results of such analyses.
- d. Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 C.F.R. § 136.3, in appendix III of 40 C.F.R. Part 261, or in certain circumstances by other methods that have been approved by the Administrator.
- e. All environmental measurements required by the permit, including, but not limited to measurements of pressure, temperature, mechanical integrity, and chemical analyses shall be done in accordance with EPA's Quality Assurance Program Plan.
- f. As part of the COMPLETION REPORT (for a newly drilled well) or a Permit Renewal (for an existing well(s)), the Permittee must submit a PLAN that describes the procedures to be carried out to obtain detailed chemical and physical analysis of representative samples of the waste including the quality assurance procedures used including the following:
  - (1) The parameters for which the waste will be analyzed and the rationale for the selection of these parameters;
  - (2) The test methods that will be used to test for these parameters; and
  - (3) The sampling method that will be used to obtain a representative sample of the waste to be analyzed.

Where applicable, the Waste Analysis Plan (WAP) submitted in association with the permit application may be incorporated by reference. The WAP must include the critical elements needed to satisfy EPA's quality assurance project plan (QAPP) requirements.

- g. The Permittee shall require a written manifest for each batch load of waste received for waste streams that are not hard piped and continuous. The manifest shall contain a description of the nature and composition of all injected fluids, date of receipt, source of material received for disposal, name and address of the waste generator, a description of the monitoring performed and the results, a statement stating if the waste is exempt from regulation as hazardous waste as defined by 40 C.F.R. § 261.4, and any information on extraordinary occurrences.
- h. For waste streams that are hard-piped continuously from the source to the wellhead, the Permittee shall also provide for continuous, recorded measurement of the discharge rate.
- i. Dates of most recent calibration or maintenance of gauges and meters used for monitoring required by this permit shall be noted on the gauge or meter. Earlier records shall be available through a computerized maintenance history database.

#### 10. Reporting Requirements

The Permittee shall give notice to the Director, as soon as possible, of any planned physical alterations or additions to the permitted facility or changes in type of injected waste.

#### 11. Anticipated Noncompliance

The Permittee shall give advance notice to the Director of any significant planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

#### 12. Twenty-Four Hour Reporting

- a. The Permittee shall report to the Director or an authorized representative any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances. The following shall be included as information that must be reported orally within 24 hours:
  - (1) Any monitoring or other information that indicates that any contaminant may cause an endangerment to an underground source of drinking water.
  - (2) Any noncompliance with a permit condition or malfunction of the injection system.
- b. A written submission shall also be provided within five (5) days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact date and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

#### 13. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise reported at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition Part I E.12.b.

#### 14. Reporting Corrections

When the Permittee becomes aware that he/she failed to submit any relevant facts in the permit application or submitted incorrect information in a permit application or in any report to the Director, the Permittee shall promptly submit such facts or information.

## 15. Signatory Requirements

- a. All permit applications, reports required by this permit and other information requested by the Director shall be signed by a principal executive officer of at least the level of vice-president, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
  - (1) The authorization is made in writing by a principal executive of at least the level of vice-president.
  - (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.
  - (3) The written authorization is submitted to the Director.
- b. If an authorization under paragraph 15.a. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph 15.a. of this section must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.
- c. Any person signing a document under paragraph 15.a. of this section shall make the following certification:

"I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

## F. **PLUGGING AND ABANDONMENT**

### 1. Notice of Plugging and Abandonment

The Permittee shall notify the Director no later than 45 days before conversion or abandonment of the well.

### 2. Plugging and Abandonment Report

The Permittee shall plug and abandon the well as provided in the Plugging and Abandonment portion of the Renewal Application, which is hereby incorporated as a part of this permit or an updated plan approved by the Director or EPA representative. Within 60 days after plugging any well the Permittee shall submit a report to the Director in accordance with 40 C.F.R. § 144.51(p). EPA reserves the right to change the manner in which the well will be plugged if the well is not proven to be consistent with EPA requirements for construction and mechanical integrity. The Director may ask the Permittee to update the estimated plugging cost periodically.

### 3. Cessation Limitation

After a cessation of facility operations of two years, the Permittee shall plug and abandon the wells in accordance with the plan unless he/she:

- a. Provides notice to the Director;
- b. Demonstrates that the well will be used in the future; or
- c. Describes actions or procedures, satisfactory to the Director that the Permittee will take to ensure that the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Director.

4. Cost Estimate for Plugging and Abandonment

- a. The Permittee estimates the 2009 cost of plugging and abandonment of the permitted Class I well(s) to be approximately \$ 626,470 (for three wells). Please refer to the Renewal Application.
- b. The Permittee must submit financial assurance and a revised estimate prior to April of each year. The estimate shall be made in accord with 40 C.F.R. § 144.62.
- c. The Permittee must keep at the facility or at the Permittee central files in Anchorage during the operating life of the facility the latest plugging and abandonment cost estimate.
- d. When the cost estimate changes, the documentation submitted under 40 C.F.R. § 144.63(f) shall be amended as well to ensure that appropriate financial assurance for plugging and abandonment is maintained continuously.
- e. The Permittee must notify the Director by registered mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding.

**G. FINANCIAL RESPONSIBILITY**

The Permittee shall maintain continuous compliance with the requirement to maintain financial responsibility and resources to close, plug, and abandon the underground injection well. If the financial test and corporate guarantee provided under 40 C.F.R. § 144.63(f) should change, the Permittee shall immediately notify the Director. The Permittee shall not substitute an alternative demonstration of financial responsibility for that which the Director has approved, unless it has previously submitted evidence of that alternative demonstration to the Director and the Director notifies him that the alternative demonstration of financial responsibility is acceptable.



## PART II

### WELL SPECIFIC CONDITIONS

#### A. CONSTRUCTION

##### 1. Casing and Cementing

All currently active and proposed wells have been constructed and completed in accordance with the original permit application and the requirements of the original EPA permit issued in 1989 and renewed in 1999. Since these are existing wells, the casing, cementing and well construction of these wells are approved (See the Renewal Application). If new replacement well(s) are drilled and constructed, then the proposed casing, cementing and well construction details shall be submitted and approved by EPA, prior to initiation of Class I injection activities.

In the event that a replacement well is drilled or completed at the Pad-3 facility, the Permittee shall case and cement the well(s) to prevent the movement of fluids into strata other than the authorized injection interval (see II.C.3, below). Casing and cement shall be installed in accordance with a casing and cement program approved by the Director and in accordance with EPA Class I well construction practices (40 C.F.R. § 146.12) and the State of Alaska/AOGCC Regulations (20 AAC § 25.030, 20 AAC § 25.412 and 20 AAC § 25.252).

If primary cement returns to surface are not observed for the casing cementing procedure, the Director or authorized representative is to be notified as to the nature of the augmented testing proposed to ensure the integrity of the cement bond and adequacy of any Top Job procedure. The Cement Bond/Ultrasonic Imaging (USIT) logs and pressure tests (leak off test and/or formation integrity test) are required for the injection casing to confirm zonal isolation and verify casing integrity. The Permittee shall provide not less than ten days advance notice to the Director for all cementing operations. Should a change(s) be required to the design casing and cementing program (due to unanticipated conditions), the Director or authorized representative shall be notified as to the nature of the change(s), so that approval is obtained from the Director or authorized representative in a timely manner enabling the well to be drilled and completed in a safe and successful manner.

##### 2. Tubing, Packer, and Completion Details

The well shall inject fluids through tubing with a packer. Tubing and packer shall be installed in accordance with the procedures that meet the requirements of both the EPA Class I standards and AOGCC requirements. The packer will be set no more than 100 feet measured depth (MD) from the top of the injection zone.

**NOTE:** Since these are existing wells, the current configurations of the completion with tubing, packer setting depths, etc. are acceptable for the NW, SE, and SW Pad-3 wells.

##### 3. New Wells in the Area of Review

EPA has set a half-mile radius as the Area of Review (AOR) for this Class I UIC permit application. New wells within the AOR shall be constructed in accordance with the Alaska Oil and Gas Conservation Commission Regulations Title 20 Chapter 25. If, in the future,, any development or service wells are drilled that penetrate the injection intervals within the area of review, these wells shall have casing cemented to the formation throughout the entire section from 200 feet TVD below the base of the Sagavanirktok injection interval at the Pad-3 wells to 200 feet TVD above the perforated injection interval (reference is Pad-3 completion schematics for the NW, SE and SW wells as shown in the Renewal Application).

#### B. CORRECTIVE ACTION

The applicant has identified 47 wells (excluding the Pad-3 wells and including all sidetracks and plugged and abandoned wells) within the ½-mile radius of the disposal well(s) at the PBU Pad-3 disposal facility (See the Renewal Application). In addition to the Pad-3 wells, the list includes all of the Drill Site-6 (DS-6) development wells and several very shallow wells in the vicinity of Pad-3. All DS-6 wells are essentially vertical to below their surface casings shoes at 2500 feet or deeper, while the Pad-3 wells were drilled to about 2250 feet, but the active perforations are at about 1980 feet. The

list of DS-6 development wells contains all of the DS-6 completions including sidetracks of the original wells to new bottom hole locations. The AOGCC convention is to consider the completions that have been sidetracked to be plugged and abandoned even though a portion of the original wellbore is still used by the sidetrack well. All of the kickoff points for the sidetracks are well below the surface casing shoe depths and significantly deeper than the perforations in the Pad-3 wells.

Also, there are no transmissive faults, open well bores, un-cemented wells or other conduits within ½ mile at the proposed well location(s) that require corrective action in order to prevent fluids from moving above the confining zone. If the applicant later discovers that a well or wells within the AOR require(s) corrective action to prevent fluid movement, then the applicant shall inform EPA upon such discovery and provide a corrective action plan for EPA Director or authorized representative review and approval. If EPA or the Permittee discovers that fluids have moved above the upper confining zone along a wellbore within the AOR, then injection shall cease until the fluid movement problem can be diagnosed and corrected.

## C. WELL OPERATION

### 1. Prior to Commencing Injection

- a. Injection operations pursuant to this permit may not commence until:  
Construction is complete and the Permittee has submitted two copies of COMPLETION FORM FOR INJECTION WELLS (EPA Form 7520-9), see APPENDIX A; and
  - (1) The Director or authorized representative has inspected or otherwise reviewed the new, existing, sidetrack or replacement injection well(s) and finds it is in compliance with the conditions of the permit; or
  - (2) The Permittee has not received notice from the Director or authorized representative of intent to inspect or otherwise review the new, sidetrack or replacement injection well(s) within thirteen (13) days of receiving the COMPLETION REPORT in which case prior inspection or review is waived and the Permittee may commence injection.
- b. The Permittee demonstrates that the well has mechanical integrity as described in Part II.C.3. Mechanical Integrity below and the Permittee has received notice from the Director or authorized representative that such a demonstration is satisfactory. The Permittee shall notify EPA at least two weeks prior to conducting this initial test so that an EPA representative may be present.
- c. The Permittee has conducted a step-rate test and submitted a preliminary report to EPA that summarizes the results.

**NOTE:** Since these are existing wells that have been on injection under an EPA permit since 1989, the above requirements for a COMPLETION REPORT and for a step-rate test (SRT) are waived. However, the requirements for demonstrating mechanical integrity on an annual basis remain in effect.

### 2. During Injection

During injection activities the well injection pressure, inner annulus pressure and injection rate will be monitored on a continuous basis. Should there be a need for direct injection at the wellhead, operators will check manifests and visually monitor onsite instrumentation.

### 3. Mechanical Integrity

- a. Standards  
The injection well(s) must have and maintain mechanical integrity pursuant to 40 C.F.R. § 146.8.
- b. Prohibition without Demonstration of Mechanical Integrity  
Injection operations are prohibited after the effective date of this permit unless the Permittee has conducted the following tests and submitted the results to the Director:

- (1) In order to demonstrate there is no significant leak in the casing, tubing or packer, the tubing/casing annulus (inner annulus) will be pressure tested upon initial completion to at least 1500 pounds per square inch gauge (psig) for not less than thirty minutes. Pressure shall show a stabilizing tendency. That is, the pressure may not decline more than 10 percent during the 30-minute test period and shall experience less than one-third of its total loss in the last half of the test period. If the total loss exceeds 10 percent or if the loss during the second 15-minute period is equal to or greater than one-half the loss during the first 15 minutes, the Permittee may extend the test period for an additional 30 minutes to demonstrate stabilization (resulting from thermal effects). This initial standard annulus pressure test (SAPT) will be required upon completion of the well and prior to the well first being placed on injection. Subsequently, the required test pressure for the SAPT will be at least 1500 psig with the same pass criteria as outlined earlier over the 30-minute test period. The SAPT will be required annually if the well is active and once every two years if the well is inactive. In order to accommodate constraints resulting from drilling, operational or other logistics (from working in Arctic North Slope conditions), the SAPT dates have been granted a three-month grace period. At the discretion of the Director, and depending on the results of the SAPT (inner annulus mechanical integrity test) data, the frequency for demonstrating internal mechanical integrity (no leaks in the tubing-casing annulus or in the tubing-packer assembly) may be revised (either increase or decrease in frequency) as specified and approved by the Director or authorized representative.
  - (2) To detect movement of fluids in vertical channels adjacent to the well bore and to determine that the confining zone is not fractured, an approved fluid movement test shall be conducted at an injection pressure at least equal to the average continuous injection pressure observed in the previous six months. Approved fluid movement tests include, but are not limited to tracer surveys, temperature logs, noise logs, oxygen activation/water flow logs (WFL), borax pulse neutron logs (PNL), or other equivalent logs. Fluid movement tests not previously used to satisfy this requirement must be submitted 30 days in advance and are subject to prior approval by the Director or authorized representative. Copies of all logs shall be accompanied by a descriptive and interpretive report. Fluid movement/confinement logs will be run initially upon completion of the well and prior to initiation of injection at start-up. After acquiring this baseline data, the fluid movement/confinement logs will be required every two (2) years while the well is active until expiration of the ten (10) year permit period. A three-month grace period is granted to the test due dates, to accommodate constraints resulting from drilling, operational or other logistics (due to working in Arctic North Slope conditions). At the discretion of the Director, and depending on the results of the baseline data, the frequency for demonstrating external mechanical integrity (no flow behind pipe and isolation above injection interval) and utilizing alternative diagnostic techniques, may be revised (either increase or decrease in frequency) as specified and approved by the Director or authorized representative.
  - (3) Internal tubing inspection logs (pipe analysis logs, caliper logs, or other equivalent logs) shall be run once every two years while the well is active, or at the Director or authorized representative's discretion, to monitor condition, thickness, and integrity of the downhole tubing. A three month grace period is granted to the test due dates, resulting from operational or logistical constraints as outlined earlier. Copies of the logs shall be accompanied by a descriptive and interpretive report.
- c. Terms and Reporting
- (1) Two (2) copies of the log(s) and two (2) copies of a descriptive and interpretive report of the mechanical integrity tests identified in 3.b (2) shall be submitted within 45 days of completion of the logging.

- (2) Mechanical integrity shall also be demonstrated by the SAPT in 3.b. (1) any time the tubing is removed from the well or if a loss of mechanical integrity becomes evident during operation. The Permittee shall report the results of such tests within 45 days of completion of the tests.
- (3) After the initial mechanical integrity demonstration, the Permittee shall notify the Director of intent to demonstrate mechanical integrity at least 30 days prior to subsequent demonstrations.
- (4) The Director will notify the Permittee of the acceptability of the mechanical integrity demonstration within 13 days of receipt of the results of the mechanical integrity tests. Injection operations may continue during this 13-day review period. If the Director does not respond within 13 days, injection may continue.
- (5) In the event that the well fails to demonstrate mechanical integrity during a test or a loss of mechanical integrity occurs during operation, the Permittee shall halt operation immediately and shall not resume operation until the Director or authorized representative gives approval to resume injection.
- (6) By written notice, the Director may require the Permittee to demonstrate mechanical integrity at any time.

#### 4. Injection Zone

Injection shall be limited to the Sagavanirktok Formation injection intervals as depicted in the completion schematics of the Pad-3 wells of the Renewal Application. The perforated injection intervals are between 1978 feet MD (top) to 2093 feet MD (bottom) (Reference is Pad-3 NW Well Type Log – Exhibits 1-8A and 1-8B of the Renewal Application)

#### 5. Waivers to UIC Program Requirements

As a result of the “no USDW” ruling for Class I injection granted by EPA during the granting of the initial Class I permit for the Pad-3 wells in 1989, EPA grants three (3) waivers of UIC regulatory program requirements as listed below:

- a. Compatibility of Formation and Injectate (40 C.F.R. §§ 146.12 (e) and 146.14 (a) (8):
- b. EPA waives the above two requirements for any additional sampling and characterization of formation fluids and injection rock matrix in order to determine whether or not they are compatible with the proposed injectate. This waiver is based upon the applicability of past injection studies and successful historical injection performance at the Pad-3 facility.
- c. Injection Zone Fracturing (40 C.F.R. § 146.13 (a)):
- d. Class I injection wells are prohibited from injection at pressures that would initiate new fractures or propagate existing fractures within the injection zone. Since the EPA has determined that there are no USDWs at the Pad-3 facility – PBU and based on the more than 20 year historical performance data submitted by BPXA which indicates that the injection fluids have been contained within the proposed Sagavanirktok injection zone at the Pad-3 facility, the EPA permit waives this prohibition, and instead permits hydraulic fracturing so long as new fractures are not initiated nor existing ones propagated within the upper and lower confining zone. However, in no case shall injection pressure initiate fractures in the confining intervals above and below the injection zone. (Reference log is Pad-3 NW Well Type Log – Exhibits 1-8A and 1-8B of the Renewal Application). Authorized injection in the Pad-3 wells will be limited to the permitted Injection Zone between approximately 1950 feet to 2100 feet MD based on the completion schematics of the existing Pad-3 Class I wells (see the Renewal Application).
- e. Ambient Monitoring Above the Confining Zone (40 C.F.R. § 146.13 (b)):

f. EPA waives the requirement to monitor the strata overlying the confining zone for fluid movement. The principal purpose of this requirement is to protect overlying USDWs, which are not present below the permafrost in the Pad-3 area. Also, most of the overlying strata and their pore fluids are frozen; permafrost extends to about 1800 feet below the land surface. Rather than monitoring strata above the confining zone, the proposed permit requires successful external mechanical integrity tests to verify that all injected fluids are exiting the permitted injection interval and there is no flow behind pipe due to channeling that would penetrate the confining zone (See Part II.C.3.b (2)).

6. Injection Rate and Pressure

Injection pressures shall not initiate new fractures or propagate existing fractures in the upper confining zone as that stratigraphic interval is described in the completion logs of the Pad-3 Class I wells of the Renewal Application.

The maximum injection pressure, measured at the wellhead, shall not exceed 1400 psig. Besides alarms and automatic shutdown controls, the wellhead assembly will include a surface safety valve to provide additional security.

7. Annulus Pressure

The annulus between the tubing and the long string casing shall be filled with a corrosion inhibited non-freezing solution. A positive surface pressure up to 150 psig is authorized for the inner annulus (tubing x long string injection casing).

Since the tubing-casing annulus volume will vary due to temperature changes, the high-low annulus pressure limits can be adjusted, if necessary and upon approval by the Director or authorized representative.

**NOTE:** The authorization of up to 150 psig on the inner annulus is to enable shut-down and alarm systems to be set at appropriate pressure limits, so as not to shut-down the facility from unintended causes not related to direct injection activities, and is not intended to allow the Permittee to continue to maintain the well on injection, in the event of a loss of mechanical integrity or when there is pressure build-up in the tubing x inner annulus, resulting in a potential sustained casing pressure scenario. In the event of a loss of mechanical integrity, then the Permittee has to meet the requirements as outlined in Part II.C.3.c.(5) of this permit.

8. Injection Fluid Limitation

This permit only authorizes the injection of those fluids identified in the permit documentation. In the event that third party wastes are accepted, the third party must certify that fluids for injection are not hazardous waste or radioactive wastes. Fluids generated from Class I injection well construction and well workover, and fluids generated from the operation and maintenance of Class I injection wells and associated injection well piping, may be disposed in a Class I non-hazardous injection well. De-characterized waste generated during remedial well workovers or well construction operations may be appropriately disposed in a Class I non-hazardous well (refer to 40 C.F.R. § 148.4(d)).

**NOTE:** Neither hazardous waste as defined in 40 C.F.R. Part 261 nor radioactive wastes other than naturally occurring radioactive material (NORM) from pipe scale and sludge shall be injected for disposal.

## D. MONITORING

1. Monitoring Requirements

Samples and measurements collected for the purpose of monitoring shall be representative of the monitored activity.

2. Continuous Monitoring Devices

Continuous monitoring devices shall be installed, maintained, and used to monitor injection pressure and rate for those streams that are hard-piped and continuous, and to monitor the pressure of non-freezing solution in the annulus between the tubing and the long string casing. Calculated flow data are not acceptable except as a back-up system if the primary continuous injection rate device malfunctions.

3. Monitoring Direct Waste Injection

Direct waste injection pumping operations at the well site shall be continuously manned and visually monitored. During these pumping operations, a chronological record of the time of day, a description of the waste pumped, injection rate and pressure, and well annulus pressure observations shall be maintained. The pumping record must be signed by the person in charge.

4. Alarms and Operational Modifications

- a. The Permittee shall install, continuously operate, and maintain alarms to detect excess injection pressures and significant changes in annular fluid pressure. These alarms must be of sufficient placement and urgency to alert operators in the control room.
- b. Plans and specifications for the alarms shall be submitted to the Director or authorized representative prior to the initiation of injection.

**E. REPORTING REQUIREMENTS**

1. Quarterly Reports

The Permittee shall submit quarterly reports to the Director containing the following information:

- a. Monthly average, maximum, and minimum values for injection pressure, rate, and volume shall be reported on INJECTION WELL MONITORING REPORT (EPA Form 7520-8).
- b. Graphical plots of continuous injection pressure and rate monitoring.
- c. Daily monitoring data in an electronic format.
- d. Physical, chemical, and other relevant characteristics of the injected fluid.
- e. Any well workover or other significant maintenance of downhole or injection-related surface components.
- f. Results of all mechanical integrity tests performed since the previous report including any maintenance-related tests and any "practice" tests.
- g. Any other tests required by the Director.

2. Report Certification

All reporting and notification required by this permit shall be signed and certified in accordance with Part I.E.15., and submitted to the following address:

UIC Manager, Ground Water Unit  
U.S. Environmental Protection Agency (OCE-127)  
1200 Sixth Avenue Suite 900  
Seattle, Washington 98101

## **APPENDIX A: REPORTING FORMS**

PDF copies of following forms are available on the [EPA's web site](#)

7520-7 APPLICATION TO TRANSFER PERMIT

[https://www.epa.gov/sites/production/files/2016-01/documents/7520-7\\_508c\\_0.pdf](https://www.epa.gov/sites/production/files/2016-01/documents/7520-7_508c_0.pdf)

7520-8 INJECTION WELL MONITORING REPORT

[https://www.epa.gov/sites/production/files/2016-01/documents/7520-8\\_508c\\_0.pdf](https://www.epa.gov/sites/production/files/2016-01/documents/7520-8_508c_0.pdf)

7520-9 COMPLETION FORM FOR INJECTION WELLS

[https://www.epa.gov/sites/production/files/2016-01/documents/7520-9\\_508c\\_0.pdf](https://www.epa.gov/sites/production/files/2016-01/documents/7520-9_508c_0.pdf)