U.S. ENVIRONMENTAL PROTECTION AGENCY

UNDERGROUND INJECTION CONTROL PERMIT

CLASS I NON-HAZARDOUS

PERMIT NUMBER IN-091-1I-0001

CRITERION CATALYSTS & TECHNOLOGIES L.P.

MICHIGAN CITY, INDIANA

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

U.S. ENVIRONMENTAL PROTECTION AGENCY
UNDERGROUND INJECTION CONTROL PERMIT: CLASS I NON-HAZARDOUS

Permit Number: IN-091-1I-0001

Facility Name: Well No. 1

Pursuant to the provisions of the Safe Drinking Water Act, as amended 42 U.S.C. §§300f et seq., and implementing regulations promulgated by the U.S. Environmental Protection Agency (EPA) at 40 C.F.R. Parts 124, 144, 146, and 147,

Criterion Catalysts & Technologies L.P. of Michigan City, Indiana

is hereby authorized to continue operation of an existing Class I non-hazardous injection well located in Indiana, LaPorte County, T38N, R4W, Section 22, SW Quarter Section, for injection into the Mt. Simon Sandstone at depths between 2867 and 4285 feet relative to Kelly bushing, upon the express condition that the permittee meet the restrictions set forth herein. The injection of any hazardous waste as identified in 40 C.F.R. Part 261 is prohibited.

All citations to the Code of Federal Regulations are to the regulations that are in effect on the date that this permit becomes effective. The following attachments are incorporated into this permit: A, B, C, D, E, F, and G.

This permit shall become effective on APR 3 0 2016, and shall remain in full force and effect during the life of the permit, unless this permit is revoked and reissued, terminated or modified pursuant to 40 C.F.R. §§144.39, 144.40, or 144.41.

This permit and authorization to inject shall expire at midnight on April 30, 2026, unless terminated prior to the expiration date.

Signed and Dated: March 15, 2016

Tinka G. Hyde

Tinka G. Hyde
Director, Water Division

PART I
GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. Notwithstanding any other provisions of this permit, the permittee authorized by this permit shall not construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of injection, annulus or formation fluids into underground sources of drinking water (USDWs). The objective of this permit is to prevent the introduction of contaminants into USDWs 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. Any underground injection activity not specifically authorized in this permit is prohibited. For purposes of enforcement, compliance with this permit during its term constitutes compliance 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 common or statutory law other than Part C of the SDWA. Issuance of this permit does not convey property 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. Nothing in this permit shall be construed to relieve the permittee of any duties under applicable regulations.

B. PERMIT ACTIONS

1. Modification, Revocation and Reissuance, and Termination - The Director of the Water Division of the U. S. Environmental Protection Agency (EPA), hereinafter, the Director, may, for cause or upon request from the permittee, modify, revoke and reissue, or terminate this permit in accordance with 40 C.F.R. §§ 144.12, 144.39, and 144.40. Also, the permit is subject to 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 in accordance with 40 C.F.R. § 144.38.

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, Subpart B, and 40 C.F.R. § 144.5, any information submitted to the EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, the EPA may make the information available to the public without further notice. If a claim is asserted, information covered by such a claim will be disclosed by EPA only to the extext, and by means of the procedures set forth in 40 C.F.R. Part 2, Subpart B. Claims of confidentiality for the following information will be denied:

1. The name and address of the permittee; and

2. Information which deals with the existence, absence or level of contaminants in drinking water.

E. DUTIES AND REQUIREMENTS

1. Duty to Comply - The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or 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 by an emergency permit issued in accordance with 40 C.F.R. § 144.34.

2. Penalties for Violations of Permit Conditions - Any person who violates a permit requirement is subject to civil penalties, fines and other enforcement action under the SDWA. Any person who willfully violates permit conditions may be subject to criminal prosecution.

3. Continuation of Expiring Permits

   (a) 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 submit a complete application for a new permit at least 180 calendar days before this permit expires.

   (b) Permit Extensions - The conditions of an expired permit may continue in force in accordance with 5 U.S.C. § 558(c) and 40 C.F.R. § 144.37.

   (c) Effect - Permits continued under 5 U.S.C. § 558(c) and 40 C.F.R § 144.37 remain fully effective and enforceable.

   (d) Enforcement - When the permittee is not in compliance with the conditions of the expiring or expired permit, the Director may choose to do any or all of the following:

(1) Initiate enforcement action based upon the permit which has been continued;

(2) Issue a notice of intent to deny the new permit. If the permit is denied, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operation without a permit;

(3) Issue a new permit under part 124 with appropriate conditions; or

(4) Take other actions authorized by these regulations.

(e) State Continuation - An EPA-issued permit does not continue in force beyond its expiration date under Federal law if at that time a State has primary enforcement responsibility under the SDWA. A State authorized to administer the UIC program may continue either EPA or State-issued permits until the effective date of the new permits, if State law allows. Otherwise, the facility or activity is operating without a permit from the time of expiration of the old permit to the effective date of the State-issued new permit. Furthermore, if the State does not continue the EPA permit upon obtaining primary enforcement responsibility, the permittee must obtain a new State permit or be authorized to inject by State rule. Failure to do so while continuing to operate the well constitutes unauthorized injection and is a violation subject to enforcement action.

4. Need to Halt or Reduce Activity Not a Defense - It shall not be a defense for the permittee in an enforcement action to claim 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 timely and reasonable steps necessary 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 furnish to the Director, within a time specified, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this

permit, or to determine compliance with this permit. The permittee shall also furnish 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, at reasonable times, 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 the SDWA, any substances or parameters at any facilities, equipment or operations regulated or required under this permit.

9. Records

   (a) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original chart recordings for continuous monitoring instrumentation and copies of all reports required by this permit for a period of at least five (5) years from the date of the sample, measurement or report, unless these materials are submitted to the Director as part of reporting requirements under this permit.

   (b) The permittee shall maintain records of all data required to complete the permit application form for this permit and any supplemental information submitted under 40 C.F.R. §§ 144.27, 144.28, and 144.31 for a period of at least five (5) years from the date the permit application was signed.

   (c) The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of plugging and abandonment of this injection well.

   (d) The retention period specified in Part I(E)(9)(a) through (c) of this permit may be extended by request of the Director at any time. The permittee shall continue to retain records after the retention period specified in Part I(E)(9)(a) through (c) of this permit or any requested extension thereof expires unless the permittee delivers the records to the Director or obtains written approval from the Director to discard the records.

(e) Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;

(2) The name(s) of individual(s) who performed the sampling or measurements;

(3) A precise description of both sampling methodology and the handling of samples;

(4) The date(s) analyses were performed;

(5) The name(s) of individual(s) who performed the analyses;

(6) The analytical techniques or methods used; and

(7) The results of such analyses.

10. Monitoring – Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Sampling and analysis shall comply with the specifications of the Waste Analysis Plan required by Part II (C)(3) of this permit. Monitoring results shall be reported at the intervals contained in Part II (D)(1) through (3) and Part III (A) of this permit.

(a) Sampling methods – The permittee shall use the methods described in EPA's "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (SW-846, available on EPA's website) or equivalent methods approved by the Director to sample the injected fluids.

(b) Analytical methods – The permittee shall use applicable analytical methods described in Table IB of 40 C.F.R. § 136.3 or in certain circumstances by other methods that have been approved by the Director to monitor the nature of the injected fluids.

11. Signatory Requirements - All reports or other information required to be submitted by this permit or requested by the Director shall be signed and certified in accordance with 40 C.F.R. § 144.32.

12. Reporting Requirements

(a) Planned Changes - The permittee shall give written notice to the Director, as soon as possible, of any planned physical alterations or additions to the permitted facility other than minor repair/replacement maintenance activities.

(b) Anticipated Noncompliance - The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) Compliance Schedules - Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted by the permittee no later than thirty (30) calendar days following each schedule date.

(d) Twenty-four Hour Reporting

(1) The permittee shall report to the Director any permit noncompliance which may endanger human health or the environment. See, e.g., Part I(G)(5) of this permit. Any information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances. Such reports shall include, but not be limited to the following information:

(i) Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; and

(ii) Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs; and

(iii) Any failure to maintain mechanical integrity.

(2) A written submission shall also be provided within five (5) working 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 dates 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.

(e) 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 Part I(E)(12)(d)(2) of this permit.

(f) Other Information - When the permittee becomes aware of failure to submit any relevant facts in the permit application or that incorrect information was submitted in a permit application or in any report to the Director, the permittee shall submit such facts or corrected information within ten (10) calendar days.

(g) Report on Permit Review - Within thirty (30) calendar days of receipt of this permit, the permittee shall certify to the Director that he or she has read and is personally familiar with all terms and conditions of this permit.

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment - The permittee shall notify the Director at least sixty (60) calendar days before conversion or abandonment of the well. At the discretion of the Director, a shorter notice period may be allowed.

2. Plugging and Abandonment - The permittee must receive the approval of the Director before plugging the well and shall plug and abandon the well consistent with 40 C.F.R. §§ 144.52(a)(6) and 146.10, as provided for in the Plugging and Abandonment Plan contained in Part III(B) of this permit. Within sixty (60) calendar days after plugging a well, the permittee shall submit a Plugging and Abandonment report to the Director. The report shall be certified as accurate by the permittee and by the person who performed the plugging operation (if other than the permittee), and shall consist of either:

   (a) A statement that the well was plugged in accordance with the Plugging and Abandonment Plan previously approved by the Director; or

   (b) If the actual plugging differed from the approved plan, a statement defining the actual plugging and explaining why the Director should approve such deviation. If the Director determines that a deviation from a previously approved plan may endanger underground sources of drinking water, the permittee shall replug the well as required by the Director.

3. Temporary Abandonment - If the permittee ceases injection into the well for more than 24 consecutive months, the well is considered to be in temporary abandoned status. Within 30 days after the end of the 24th consecutive month of temporary abandonment, the permittee shall plug and abandon the well unless the permittee:

   (a) Provides notice to the Director within 30 days of the end of the 24th consecutive month of temporary abandonment, and

   (b) Describes actions or procedures, satisfactory to the Director, that the owner or operator will take to ensure that the well will not endanger USDWs 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.

   During any periods of temporary abandonment or disuse, the well shall be tested to ensure that it maintains mechanical integrity. Internal mechanical integrity (Part G(2)(a)) shall be tested annually. External mechanical integrity (Part G(2)(b)) shall be tested every two years. If the well loses mechanical integrity prior to the next test due date, the well must either be plugged or repaired and retested within 45 days of losing mechanical integrity. The permittee shall continue to comply with the conditions of this permit, including all monitoring and reporting requirements according to the frequencies outlined in the permit.

4. Revision of Plugging and Abandonment Plan - If the permittee finds it necessary to change a Plugging and Abandonment Plan, a revised plan shall be submitted to the Director for approval at the time of the next monthly report.

5. Standards for Well Closure - Prior to plugging and abandoning the well:

   (a) The permittee shall observe and record the pressure decay for a time specified by the Director and shall report this information to the Director.

   (b) The permittee shall conduct appropriate mechanical integrity testing to ensure the integrity of that portion of the long string casing and cement that will be left in the ground after closure. Testing methods may include:

      (1) Pressure tests with liquid;

      (2) Noise, temperature, pipe evaluation, or cement bond logs; or

      (3) Any other test required by the Director.

   (c) Prior to well closure, the well shall be flushed with a buffer fluid.

G. MECHANICAL INTEGRITY

1. Standards - The injection well must have and maintain mechanical integrity consistent with 40 C.F.R. §§ 146.8(a)(1) and (2). Mechanical integrity demonstrations must be witnessed by an authorized representative of the Director, unless the Director's designee informs the permittee that EPA is not able to witness the test.

2. Periodic Mechanical Integrity Testing - The permittee shall conduct the mechanical integrity testing as follows:

   (a) Long string casing, injection tubing and annular seal shall be tested by means of an approved pressure test in accordance with 40 C.F.R. § 146.8(b)(2). This test shall be performed at least once every twelfth month beginning with the date of the last approved demonstration and whenever there has been a well workover in which tubing is removed from the well, the packer is reset, or when loss of mechanical integrity becomes suspected during operation;

   (b) An approved temperature, noise, oxygen activation, or other approved log shall be run at least once every sixty (60) months from the date of the last approved demonstration to test for movement of fluid along the bore hole. The Director may require such tests whenever the well is worked over. The permittee must submit logging procedures to the Director for approval before running logs for the purpose of meeting this requirement.

   (c) The permittee may request the Director to use any other test approved by the Director in accordance with the procedures in 40 C.F.R. § 146.8(d).

3. Prior Notice and Reporting - The permittee shall notify the Director of his or her intent to demonstrate mechanical integrity at least thirty (30) calendar days prior to such demonstration. At the discretion of the Director a shorter time period may be allowed. Reports of mechanical integrity demonstrations which include logs must include an interpretation of results by a knowledgeable log analyst. The permittee shall report the results of a mechanical integrity demonstration within forty-five (45) calendar days after completion thereof.

4. Gauges - The permittee shall calibrate all gauges used in mechanical integrity demonstrations to an accuracy of not less than one-half (0.5) percent of full scale, prior to each required test of mechanical integrity. A copy of the calibration certificate shall be submitted to the Director or his or her representative at the time of demonstration and every time the gauge is calibrated. The gauge shall be marked in no greater than five (5) psi increments.

5. Loss of Mechanical Integrity - If the permittee or the Director finds that the well fails to demonstrate mechanical integrity during a test, or fails to maintain mechanical integrity during operation, or that a loss of mechanical integrity as defined by 40 C.F.R. §§ 146.8(a)(1) and (2) is suspected during operation, the permittee shall halt the operation immediately and follow the reporting requirements as directed in Part I(E)(12) of this permit. The permittee shall not resume operation until mechanical integrity is demonstrated and the Director gives approval to recommence injection.

6. Mechanical Integrity Testing on Request From Director - The permittee shall demonstrate mechanical integrity at any time upon written notice from the Director.

H. FINANCIAL RESPONSIBILITY

1. Financial Responsibility - The permittee shall maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner consistent with 40 C.F.R. § 144.52(a)(7). The approved financial assurance mechanism is found in Part III(C) of this permit.

   (a) The permittee must maintain a written cost estimate, in current dollars, for the Plugging and Abandonment Plan as specified in 40 C.F.R. § 146.10. The plugging and abandonment cost estimate at any point in the life of the facility operation must equal the maximum cost of plugging and abandonment at that time.

   (b) The permittee must adjust the cost estimate of plugging and abandonment for inflation within thirty (30) calendar days after each anniversary of the first estimate. The inflation factor is the result of dividing the latest published annual Oil and Gas Field Equipment Cost Index by the index for the previous year.

(c) The permittee must revise the plugging and abandonment cost estimate whenever a change in the Plugging and Abandonment Plan increases the cost of plugging and abandonment.

(d) If the revised plugging and abandonment estimate exceeds the current amount of the financial assurance mechanism, the permittee shall submit a revised mechanism to cover the increased cost within thirty (30) calendar days after the revision specified in Part I(H)(1)(b) and (c) of this permit.

(e) The permittee must keep on file at the facility a copy of the latest plugging and abandonment cost estimate prepared in accordance with 40 C.F.R. §144.52(a)(7), during the operating life of the facility.

2. Insolvency - The permittee must notify the Director within ten (10) business days of any of the following events:

(a) The bankruptcy of the trustee or issuing institution of the financial mechanism; or

(b) Suspension or revocation of the authority of the trustee institution to act as trustee; or

(c) The institution issuing the financial mechanism losing its authority to issue such an instrument.

3. Notification - The permittee must notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code naming the owner or operator as debtor, within ten (10) business days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he or she is named as debtor, as required under the terms of the guarantee.

4. Establishing Other Coverage - The owner or operator must establish other financial assurance or liability coverage acceptable to the Director, within sixty (60) calendar days of the occurrence of the events in Part I(H)(2) or (3) of this permit.

I. CORRECTIVE ACTION

1. Compliance - The permittee shall comply with 40 C.F.R. §§ 144.55 and 146.7.

2. Corrective Action Plan - The permittee shall file a Corrective Action Plan for approval by the Director within thirty (30) days of a written determination by the Director that improperly plugged, completed, or abandoned wells, or wells for which plugging or completion information is unavailable, are present in the area of review and penetrate the confining zone of the permitted well, as defined in the administrative record for this permit.

3. Prohibition of Movement of Fluids into USDWs - Should upward migration of fluids through the confining zone of this permitted well be discovered within the two mile area of review due to injection activities at this facility, and should this migration of fluids cause the introduction of any contaminant into a USDW pursuant to 40 C.F.R. § 144.12, the permittee shall immediately cease injection into this well until the situation has been corrected and reauthorization to inject has been given by the Director.

PART II
WELL SPECIFIC CONDITIONS FOR UIC PERMITS

A. CONSTRUCTION

1. Siting [40 C.F.R. § 146.12(a)] – All Class I wells shall be sited in such a fashion that they inject into a formation which is beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.

2. Casing and Cementing [40 C.F.R. § 146.12(b)] - Notwithstanding any other provisions of this permit, the permittee shall case and cement the well in such a manner so as to prevent the movement of fluids into or between USDWs for the expected life of the well. The casing and cement used in the construction of this well are shown in Part III(E) of this permit and in the administrative record for this permit. Any change shall be submitted for approval by the Director before installation.

3. Tubing and Packer Specifications [40 C.F.R. § 146.12(c)] - The permittee shall inject only through tubing with a packer set within the long string casing at a point within or below the confining zone. The tubing and packer used in the well are represented in engineering drawings contained in Part III(E) of this permit. Any changes shall be submitted by the permittee for the approval of the Director before installation.

4. Wellhead Specification [40 C.F.R. § 144.51(i)(4)] - The permittee shall install and maintain a female coupling and valve on the wellhead, to be used for independent injection pressure readings. Further, the permittee shall install a sampling port for waste sampling consistent with the permittee's waste sampling procedures, if applicable.

B. OPERATIONS [40 C.F.R. § 146.13]

1. Injection Pressure Limitation - Except during stimulation, the permittee shall not cause or permit the injection pressure at the wellhead to exceed the maximum limitation which is specified in Part III(A) of this permit. In no case shall injection pressure initiate fractures or propagate existing fractures in the confining zone or cause the movement of injection or formation fluids into a USDW.

2. Additional Injection Limitation - No waste streams other than those identified in Part III(F) of this permit shall be injected. Every twelfth month the permittee shall submit a certified statement attesting to compliance with this requirement.

3. Annulus Fluid and Pressure - The permittee shall fill the annulus between the tubing and the long string casing with a fluid approved by the Director and identified in the administrative record of this permit. Any change in the annulus fluid, except during workovers or times of annulus maintenance, shall be submitted by the permittee for the approval of the Director before replacement. Except during workovers, the

permittee shall maintain a positive pressure on the annulus as specified in Part III(A) of this permit.

4. Annulus/Tubing Pressure Differential - Except during workovers or times of annulus maintenance, the permittee shall maintain, over the entire length of the tubing, a pressure differential between the tubing and annulus as specified in Part III(A) of this permit.

5. Automatic Warning and Automatic Shut-off System - The permittee shall continuously operate and maintain an automatic warning and automatic shut-off system to stop injection in any of the following situations:

   (a) Pressure changes in the annulus or annulus/tubing differential signifying or identifying possible deficiencies in mechanical integrity; or

   (b) Injection pressure, annulus pressure, or annulus/tubing differential pressure reaches the pressure limits as specified in Part III(A) of this permit.

   Unless a trained operator is present on site property who is able to perceive shut-down alarms and is able to respond to the well controls or the wellhead within thirty (30) minutes of a compliance alarm condition at all times when the well is operating, the special permit conditions related to the remote monitoring of the well in Attachment G of this permit shall apply. The permittee must test the automatic warning and automatic shut-off system at least every twelfth month. This test must involve subjecting the system to simulated failure conditions and must be witnessed by the Director or his or her representative unless the Director waives this requirement.

6. Precautions to Prevent Well Blowouts [40 C.F.R. §§144.51(e), 144.52(a)(9) and (b)(1)]

   (a) The permittee shall maintain on the well at all times a pressure which will prevent the return of the injection fluid to the surface. The well bore must be filled with a high specific gravity fluid during workovers to maintain a positive (downward) gradient and/or a plug shall be installed which can resist the pressure differential. A blowout preventer must be kept in proper operational status during workovers.

   (b) In cases where the injected wastes have the potential to react with the injection formation to generate gases, the permittee shall follow the procedures below to assure that a backflow or blowout does not occur:

      (1) Limit the temperature, pH or acidity of the injected waste; and

      (2) Develop procedures necessary to assure that pressure imbalances do not occur.

C. MONITORING

1. Sampling Point - The injection fluid samples shall be taken at the sampling location as specified in Part III(A) of this permit.

2. Continuous Monitoring Devices - The permittee shall maintain continuous monitoring devices and use them to monitor injection pressure, flow rate, and the pressure on the annulus between the tubing and the long string of casing. If the well is equipped with a fluid level indicator, the permittee shall monitor the fluid level daily. The monitoring results shall be submitted to the Director as specified in Part II(D) of this permit. The permittee shall maintain for EPA's inspection at the facility an appropriately scaled, continuous analog record of these monitoring results as well as original copies of any digitally recorded information pertaining to these operations.

3. Waste Analysis Plan [40 C.F.R. § 144.52(a)(5)] - The permittee shall comply with the written Waste Analysis Plan which describes the procedures used to monitor the nature of injected fluids and the procedures which will be carried out to comply with Part (I)(E)(10) of permit. A copy of the approved plan shall also be kept at the facility.

4. Ambient Monitoring [40 C.F.R. § 146.13(d)(1)] - The permittee shall monitor the pressure buildup in the injection zone, and at least once every twelfth month thereafter, including at a minimum, a shutdown of the well for a time sufficient to conduct a valid observation of the pressure fall-off curve. From this observation, the permittee shall submit a report including at least a calculation of pressure build-up in the injection zone, injection zone transmissivity, and wellbore skin factor. If the permittee chooses, the ambient monitoring may be performed on only one of the wells at the facility during each twelfth month monitor event. In this case, the permittee shall alternate the twelve month testing between the wells on site.

5. Temperature Monitoring – The permittee shall monitor injectate temperature at least once daily on each day during which injection occurs. If injection occurs for more than twelve (12) hours during any calendar day, a minimum of two temperature recordings will be recorded with not less than a six (6) hour separation between readings. The monitoring results shall be submitted to the Director as specified in Part II(D)(1)(f) of this permit.

D. REPORTING REQUIREMENTS [40 C.F.R. § 146.13(c)]

The permittee shall submit all required reports to the Director at:

U.S Environmental Protection Agency - Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590
ATTN: UIC Branch (WU-16J)

1. Monthly Reports - The permittee shall submit monthly reports of the following information no later than the end of the month following the reporting period:

   (a) A tabulation of maximum injection pressure, a daily measurement of annulus tank fluid level, and minimum differential between simultaneous measurements of injection pressure and annulus pressure for each day of the month;

   (b) Appropriately scaled graphs showing injection pressure and flow rate and annulus tank fluid level. One graph must include, at a minimum, daily maximum injection pressure and daily average flow rate, on a single, monthly chart.

   (c) A statement of the total volumes of the fluid injected to date, in the current calendar year, and the current month;

   (d) A tabulation of the dates, amounts and types of liquid added to or removed from the annulus system during the month, and the cumulative additions and cumulative subtractions for the current month and each of the past 12 months;

   (e) Any noncompliance with conditions of this permit, including but not limited to:

      (1) Any event that exceeds operating parameters for annulus pressure or injection pressure or annulus/tubing differential as specified in the permit; or

      (2) Any event which triggers an alarm or shutdown device required in Part II(B)(5) of this permit.

   (f) The monthly average of the measured values of injectate temperature. If temperature measurements are recorded when the well is not injecting, those measurements will not be included in calculating the monthly average. Records of all temperature measurements must be maintained in accordance with Part I(E)(9)(a) of this permit.

2. Quarterly Reports - The permittee shall report at least every quarter the results of the injection fluid analyses specified in the approved waste analysis plan as recorded in the administrative record for this permit. This report must include statements showing that the requirements of Part I(E)(10) and Part II(C)(3) have been met.

3. Annual Reports - The permittee shall report the following at least every twelfth month:

   (a) Results of ambient monitoring required by 40 C.F.R. § 146.13(d)(1) and Part II(C)(4) of this permit; and

(b) A certified statement attesting that no waste streams other than those identified in Part II(B)(2) of this permit were injected into the well.

4. Reports on Well Tests and Workovers - Within forty-five (45) calendar days after the activity, the permittee shall report to the Director the results of demonstrations of mechanical integrity, any well workover, or results of other tests required by this permit.

PART III
ATTACHMENTS

These attachments include, but are not limited to, permit conditions and plans concerning operating procedures, monitoring and reporting, as required by 40 C.F.R. Parts 144 and 146. The permittee shall comply with these conditions and adhere to these plans as approved by the Director, as follows:

A. SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)

B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)

C. FINANCIAL ASSURANCE MECHANISM (ATTACHED)

D. CONTINGENT CORRECTIVE ACTION (ATTACHED)

E. CONSTRUCTION DETAILS (ATTACHED)

F. SOURCE AND ANALYSIS OF WASTE (ATTACHED)

G. SPECIAL CONDITIONS RELATED TO REMOTE MONITORING (ATTACHED)

SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS

CHARACTERISTIC	LIMITATION FREQUENCY	MINIMUM MONITORING FREQUENCY	MINIMUM REPORTING
Injection Pressure	832 psig maximum*	continuous	monthly
Annulus Pressure	100 psig minimum	continuous	monthly
Annulus/Tubing Differential	100 psig minimum above operating injection pressure	continuous	monthly
Flow Rate		continuous	monthly
Temperature**		daily**	monthly
Sight Glass Level		daily	monthly
Cumulative Volume		continuous	monthly
Annulus Fluid Loss		monthly	monthly
Physical Characteristics of Injected Fluids***		monthly	monthly
Chemical Composition of Injected Fluids***		monthly	monthly
pH		continuous	monthly

Sampling Location: The injection fluid samples shall be taken from the sample valve located in the pumphouse, between the storage tank and the booster pump.

* The limitation on injection pressure will serve to prevent injection-formation fracturing. This limitation was calculated using the following formula: [{Fracture Gradient – (0.433 psi/ft × specific gravity)} × depth] - 14.7 psi. The fracture gradient of .72 psi/ft was determined by site specific testing of the injection zone. The Mt. Simon Sandstone at 2867 feet was used as the depth and a specific gravity of 1.03 was used for the injection fluid. Tubing friction loss of 61 psi is added to compensate for the loss, adjusting the maximum injection pressure to: 771 + 61 = 832 psi.

** Frequency of temperature measurements will be in accordance with Section II(C)(5) of this permit. Reporting of injectate temperature will be in accordance with Section II(D)(1)(f) of this permit.

*** As specified in the Sampling and Analysis Plan, found in the administrative record for this permit. At a minimum, this analysis shall include, but not be limited to, the following: Specific Conductance, pH and Specific Gravity.

ATTACHMENT B
PLUGGING AND ABANDONMENT PLAN

OMB No. 2040-0042 Approval Expires 11/30/2014

EPA

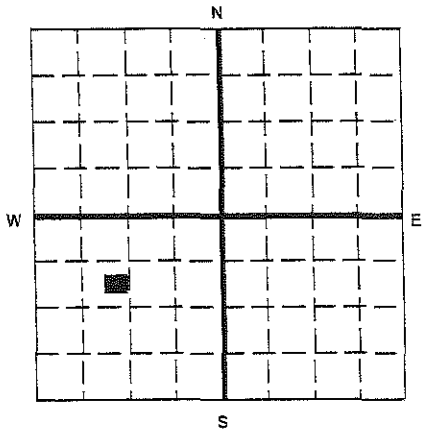
United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility
Criterion Catalysts & Technologies L.P.
1800 East U.S. 12
Michigan City, IN 46360 (219) 874-6211

Name and Address of Owner/Operator
Criterion Catalysts & Technologies L.P.
Two Greenspoint Plaza St. 1000 Northcase
Houston, TX 77060

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
IN	LaPorte	US EPA IN-091-1I-0001

Surface Location Description
SW 1/4 of NW 1/4 of SW 1/4 of ____ 1/4 of Section 22 Township 38N Range 4W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 1039ft. frm (N/S) Ctr Line of quarter section
and 1267ft. from (E/W) W Line of quarter section.

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 2

Lease Name Not applicable

WELL ACTIVITY
- [x] CLASS I
- [ ] CLASS II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Well Number 1

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
7 5/8"	26.4#		2853'	9 5/8"
9 5/8"	36# & 40#		2897'	12 1/4"
13 3/8	54.5#		989'	17 1/2"
20"	94#		221'	26"

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [ ] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [x] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inche	8-1/2"	7-7/8"					
Depth to Bottom of Tubing or Drill Pipe (ft.	2897'	2853'					
Sacks of Cement To Be Used (each plug)	100	555					
Slurry Volume To Be Pumped (cu. ft.)	136	755					
Calculated Top of Plug (ft.)	2853'	0'					
Measured Top of Plug (if tagged ft.)	2853'	0'					
Slurry Wt. (Lb./Gal.)	14.7	14.7					
Type Cement or Other Material (Class III)	2% Cl A	2% Cl A					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
none			

Estimated Cost to Plug Wells
$68,070, See 09/2014 permit renewal for details

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 possiblity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Ken Cooper, P.E. - Petrotek Engineering Corp.		09/17/2014

CEMENT, VOLUMES, FLUIDS and HOLE SIZE

TUBULARS and COMPONENTS

(A) 26" Hole, Cemented to Surface with 450 sacks.

(B) 17 1/2" Hole. Cemented to Surface with 965 sacks.

(C) 12 1/4" Hole, Cemented to Surface with 1250 sacks.

(D) Class A Cement from retainer to surface.

(E) Class A Cement, 3100' to retainer.

[1] Conductor Casing: 20" O.D., 95 #, J-55. Set @ 221'.

[2] Surface Casing: 13 3/8", O.D., 54.5 #, J-55. Set @ 989'.

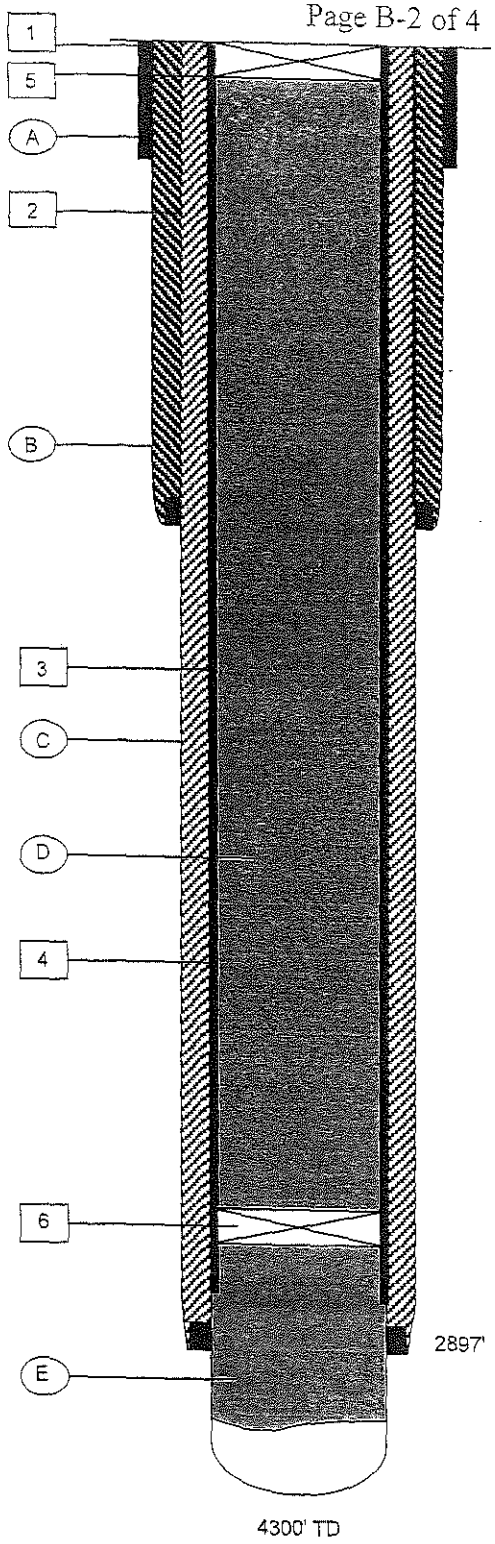
[3] Protection Casing: 9 5/8", O.D. Set @ 2897'.

[4] Liner: 7 5/8", 26.40 lb/ft, J-55. Set @ 2853'. Cemented to surface with 350 sacks Class H.

[5] Steel plate welded to casing.

[6] Cement retainer in 7 5/8" casing liner near shoe @ 2897'.

NOTE: All depths referenced from Kelly Bushing (KB). True KB elevation is 615' above sea level.



Criterion Catalysts & Technologies
Michigan City, Indiana

Figure Q-1
Well Abandonment Schematic, Well No. 1
2014 Criterion UIC Permit Re-Application

Scale: NTS	Date: September 2014	
2014_UIC_PRA_Fig_Q-01.ai	By: JLM	Checked: KC

Petrotek
5995 South Zang Street, Suite 200
Littleton, Colorado 80127 USA
303-290-9414
www.petrotek.com

2.Q PLUGGING AND ABANDONMENT PLAN

Submit a plan for plugging and abandonment of the well Including (1) describe the type, number, and placement (including the elevation of the top and bottom) of plugs to be used; (2) describe the type, grade, and quantity of cement to be used; and (3) describe the method to be used to place plugs, including the method used to place the well in a state of static equilibrium prior to placement of the plugs. Also, for a Class III well that underlies or is in an exempted aquifer, demonstrate adequate protection of USDWs. Submit this information on EPA Form 7520-14, Plugging and Abandonment Plan.

Response:

The following completed copies of EPA Form 7520-14, Plugging and Abandonment Plan, are submitted to satisfy this requirement. Figure Q-1 and Q-2 are the plugging and abandonment diagrams for UIC Well Nos. 1 and 2, respectively. The modifications made to this form are to provide consistency with all available and current information. The plan for UIC Well No. 3 is also summarized in graphical form (Figure Q-3) in this response. Costs associated with the plugging and abandonment of the wells per the following procedures are presented in the completed plugging forms.

General

When it has been determined a well can no longer operate effectively or is no longer needed, it will be plugged in a manner consistent with regulatory requirements as to eliminate the potential for uphole migration of injected fluids. The regional USEPA office will be notified, as well as the state, of the intent to plug and approval will be required. The same plugging procedure will apply to the two existing wells and the proposed well as the construction details are nearly identical. Copies of the well plugging forms for the wells are included in this Attachment.

2.Q.1 Plugging Procedure (Class I Non-Hazardous)

a. Prepare location to receive rig and associated equipment.

b. Move in and rig up workover rig. Spot additional support equipment.

c. Place approximately 200 barrels brine water of sufficient density in tanks and pump 50 to 100 barrels down tubing to kill well and flush tubing. Release tubing from packer and pump sufficient volume of brine water down annulus to completely overbalance reservoir pressure and assure the well is dead and also to flush the annulus.

d. Remove tree and install blowout preventors.

e. Re-engage and release packer. Pull tubing and packer from well and dispose of properly. As an alternative to step "c" thru "f" use exiting tubing and packer as workstring to pump cement plug below retainer per step "g".

f. Run in hole with squeeze retainer on 2 ⅞-inch tubing. Set retainer near base of 9 ⅝-inch (or 7-5/8" or 7") casing as applicable.

g. Pump approximately 70 bbl of 9.5#/gal mud into openhole followed by a minimum of 100 sack cement plug (Class "A" with up to 2% bentonite) as a plug below the cement retainer.

h. Unsting from retainer or cut/back-off tubing from packer and wait on cement before testing cement to 500 psi for a minimum of 15 minutes.

i. From this point begin to stage load casing with 100 sacks Class "A" with up to 2% bentonite cement, pull 8 joints tubing/workstring. Continue stage loading hole in approximately 100 sacks cement of slurry in balanced increments and pulling 8 joints until cement has been used to completely fill the long-string casing with cement. Less than 100 sx cement pumped below retainer will be required for bottom of plug at 3,100' in each well.

j. After bringing the tubing out of the hole with the cement at the surface, remove the BOP and wellhead equipment. Cut off casing three feet below ground level and weld a steel plate cover with pertinent well data onto the remaining casing.

k. Install a permanent marker on the wellsite.

l. Release workover rig and support equipment. Restore location.

m. Prepare a plugging report and final well status drawing and submit to appropriate agencies and personnel.

The following table summarizes estimated costs (total $214,650) for plugging and abandonment of the Criterion Catalysts & Technologies Class I Injection wells.

Table Q-1
Criterion Catalysts & Technologies, L.P.
Plugging and Abandonment Costs (August 2014)

Category	Well No. 1	Well No. 2	Well No. 3
Cement & Mud (655 sx cmt Well 1, 555 sx Well 2, 1055 sx Well 3)	23,970	22,180	35,200
Rig & Equipment Rentals	19,500	19,500	19,500
Cement Retainer (7-5/8" Well 1, 7", Well 2, 9-5/8" Well 3)	7,400	7,100	8,700
Miscellaneous	17,200	17,200	17,200
Total Cost	$68,070	$65,980	$80,600

ATTACHMENT C
FINANCIAL ASSURANCE MECHANISM

Shell Oil Company
Controller
P. O. Box 2463
Houston, TX 77252-2463
United States of America

Mary A. Gade – Regional Administrator
Environmental Protection Agency
UIC Section 5 W (WD-17J)
77 West Jackson Blvd.
Chicago, IL 60604-3590

September 17, 2014

Dear Ms. Gade:

I am the Controller of Shell Oil Company, P.O. Box 2463, Houston, TX 77252-2463. This letter is in support of the use of the financial test to demonstrate financial assurance as specified in Subpart F of 40 CFR Part 144.

1. This firm is the owner of operator of the following injection wells for which financial assurance for plugging and abandonment is demonstrated through the financial test specified in Subpart F of 40 CFR Part 144. The current plugging and abandonment cost estimate covered by the test is shown for each injection well: none.

2. This firm guarantees, through the corporate guarantee specified in Subpart F of 40 CFR Part 144, the plugging and abandonment of the following Class I injection wells owned or operated by subsidiaries of this firm. The current cost estimate for plugging and abandonment so guaranteed is shown for each injection well:

   See Exhibit A $ 214,650

   2a. This firm guarantees, through the guarantee specified in subpart H of 40 CFR parts 264 and 265, the corrective action care of the following facilities owned or operated by the guaranteed party. The current cost estimates for the corrective action care so guaranteed are shown for each facility: none.

3. In states where EPA is not administering the financial requirements of Subpart F of 40 CFR Part 0144, this firm, as owner or operator or guarantor, is demonstrating financial assurance for the plugging and abandonment of the following injection wells through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart F of 40 CFR Part 0144. The current plugging and abandonment cost estimate covered by such a test are shown for each facility injection well: None

4. This firm is the owner or operator of the following injection wells for which financial assurance, for plugging and abandonment is not demonstrated either to EPA or a State through the financial test or any other financial assurance

mechanism specified in Subpart F 40 CFR Part 0144 or equivalent or substantially equivalent State mechanisms. The current plugging and abandonment cost estimate not covered by such financial assurance is shown for each injection well: None.

This firm is not required to file a Form 10-K with the Securities and Exchange Commission (SEC) for the latest fiscal year. The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this owner's or operators independently audited, year-end financial statements for the latest completed fiscal year ended December 31, 2013.

Alternative II

1. (a) Current plugging and abandonment cost	$ 214,650
(b) Sum of the company's financial responsibilities under 40 CFR parts 264 and 265, Subpart H, currently meeting the financial test or corporate guaranty.	$ -
(c) Total of lines a and b	$ 214,650
2. Current bond rating of most recent issue of this firm and name of rating service	Aa2 by Moody's AA by Standard & Poor's
3. Date of issuance of bond.	09/21/1993
4. Date of maturity of bond.	09/01/2023
*5. Tangible net worth	$ 34,062,000,000 [a]
*6. Total assets in the U.S.	$ 71,315,000,000 [b]
7. Is line 5 at least $10 million?	X YES ____ NO
8. Is line 7 at least 6 times line 1?	X YES ____ NO
*9. Are at least 90% of assets located in the U.S? If not, complete line 10.	____ YES X NO
10. Is line 6 at least 6 times line 1?	X YES ____ NO

I hereby certify that the wording of this letter is identical* to the wording specified in 40 CFR 144.70 (f) as such regulations were constituted on the date shown immediately below.

Anthony M Nolte

Anthony M. Nolte
Controller

[a]Shareholder's equity $35,068,000,000 minus Goodwill/Intangible $1,006,000,000 = $ 34,062,000,000
[b]Total U.S. Assets $72,321,000,000 minus Goodwill/Intangible $1,006,000,000 = $ 71,315,000,000

EXHIBIT A

GUARANTEE PLUGGING AND ABANDONMENT

Guarantee made this 30th day of March 2011 by Shell Oil Company, P. O. Box 2463, Houston, Texas 77252-2463, herein referred to as guarantor to the United States Environmental Protection Agency (EPA), obligee, on behalf of our subsidiary Criterion Catalyst Technologies, LP (CCTLP) Two Greenspoint Plaza 16825 Northchase Drive, Suite 1000, Houston, Texas 77060.

Recitals

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in 40 CFR 144.63(e).

2. CCTLP owns or operates the following Class I non-hazardous waste injection well covered by this guarantee: See Exhibit A

   Guarantee is for closure.

3. "Plugging and abandonment plan" as used below refer to the plan maintained as required by 40 CFR Parts 144 for the plugging and abandonment of injection wells as identified above.

4. For value received from CCTLP guarantor guarantees to EPA in the event that CCTLP fails to perform plugging of the above facility(ies) in accordance with the plugging and abandonment plan and other requirements when required to do so, the guarantor will do so or establish a trust fund as specified in 40 CFR 144.63 in the name of CCTLP in the amount of the adjusted plugging and abandonment cost estimates prepared as specified in 40 CFR 144.62.

5. Guarantor agrees that if, at the end of any fiscal year before termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor shall send within 90 days, by certified mail, notice to the EPA Regional Administrator for the Region(s) in which the facility(ies) are located and to CCTLP that he intends to provide alternate financial assurance as specified in 40 CFR 144.63 in the name of CCTLP. Within 30 days after sending such notice, the guarantor will establish such financial assurance if CCTLP has not done so.

6. The guarantor agrees to notify the Regional Administrator by certified mail, of a voluntary or involuntary case under Title 11 U.S. Code, naming guarantor as debtor, within 10 days after commencement.

7. Guarantor agrees that within 30 days after being notified by an EPA Regional Administrator of a determination that guarantor no longer meets the financial test criteria or that he is disallowed from continuing as a guarantor of plugging and abandonment, he will establish alternate financial assurance, as specified 40 CFR 144.63, in the name of CCTLP unless CCTLP has done so.

8. Guarantor agrees to remain bound under this guarantee notwithstanding any or all of the following: amendment or modification of the plugging and abandonment plan, the extension or reduction of the time of performance of plugging and abandonment or any other modification or alternation of an obligation CCTLP pursuant to 40 CFR 144.

9. Guarantor agrees to remain bound under this guarantee for as long as CCTLP must comply with the applicable financial assurance requirements of 40 CFR 144 for the above-listed facilities, except that guarantor may cancel this guarantee by sending notice by certified mail, to the EPA Regional Administrator(s) for the Region(s) in which the facility(ies) are located and to CCTLP, such cancellation to become effective no earlier than 120-days after actual receipt of such notice by both EPA and CCTLP as evidenced by returned receipts.

10. Guarantor agrees that if CCTLP fails to provide alternate financial assurance and obtain written approval of such assurance from the EPA Regional Administrator(s) within 90 days after a notice of cancellation by the guarantor is received by both the EPA Regional Administrator(s) and CCTLP, guarantor will provide such alternate financial assurance as specified in 40 CFR 144.63 in the name of CCTLP.

11. Guarantor expressly waives notice of acceptance of this guarantee by the EPA or CCTLP. Guarantor also expressly waives notice of amendments or modification of the plugging and abandonment plan.

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR 444.70(f).

Effective date: September 17, 2014

Name of guarantor: Shell Oil Company

Authorized signature of guarantor: Anthony M Nolte

Name of person signing: Anthony M. Nolte

Title of person signing: Controller

Signed and sealed in the presence of:

NOTARY PUBLIC

JACKLINE R. SHEPARD
Notary Public, State of Texas
My Commission Expires
October 31, 2017

Notary Public Harris County

EXHIBIT A

Facility	Location	UIC Permit Numbers I.D. No.-IND-005-159-546	Plugging + Abandonment Cost
Michigan City	Michigan City	IN-091-1L-0001	$ 68,070
	Indiana	IN-091-1L-0002	65,980
	Michigan City	IN-091-1L-0004	80,600
		TOTAL	$ 214,650

ATTACHMENT D
CONTINGENT CORRECTIVE ACTION

ATTACHMENT D
CONTINGENT CORRECTIVE ACTION

The area of review for this facility is composed of the area within a two-mile radius of this facility. Other than the two active Criterion Class I injection wells, there are no known artificial penetrations to the top of the injection zone or confining zone with the area of review. A corrective action plan is therefore not required for any artificial penetrations within the Criterion area of review. If a corrective action plan for any neighboring well becomes necessary in the future, it will be developed according to appropriate regulatory standards and guidelines.

The corrective action plan that would be proposed by Criterion, should upward fluid migration through the confining layer into a USDW be detected in any wellbore, will include the following:

1. Criterion waste disposal wells will be shut-in.
2. The U.S. EPA Region 5 UIC Branch and the Indiana Department of Natural Resources will notified.
3. Following well shut-in, waste will be shipped to alternative permitted facilities for off-site treatment and disposal as necessary.
4. A contingency plan will be prepared as follows:
    a. Locate well and identify present operator or owner, if any.
    b. Identify mode of failure
    c. Prepare remedial plan outlining course of action
    d. The remedial plan will be submitted to EPA Region 5 for approval
    e. Upon authorization, the remedial plan will be implemented.

Should a well failure occur in any of the Criterion injection wells that has the potential to allow injected fluids to migrate into a USDW, the affected well would be shut-in, appropriate actions required by applicable regulations and permits would be followed regarding regulatory notifications and repairs, and the remaining well(s) would be utilized to manage plant wastes if continued operation would remain protective of the environment. Single well capacity might be supplemented through waste shipment to licensed off-site facilities, or plant operations could be curtailed to match disposal capacity. Failure of all wells on site would result in waste shipment of licensed off-site facilities or curtailment of plant operations.

ATTACHMENT E
CONSTRUCTION DETAILS

CEMENT, VOLUMES, FLUIDS and HOLE SIZE

TUBULARS and COMPONENTS

(A) 26" Hole, Cemented to Surface with 450 sacks.

(B) 17 1/2" Hole, Cemented to Surface with 965 sacks.

(C) 12 1/4" Hole, Cemented to Surface with1250 sacks.

(D) Annulus Fluid: Inhibited water.

(E) Completion: 8 1/2" Open Hole 2897' - 4300'+/-.
Variable Wellbore Fill @ TD
Wellbore Fill @ 4,127' 6/28/2012.

[1] Conductor Casing: 20" O.D., 95 #, J-55. Set @ 221'.

[2] Surface Casing: 13 3/8", O.D., 54.5 #, J-55. Set @ 989'.

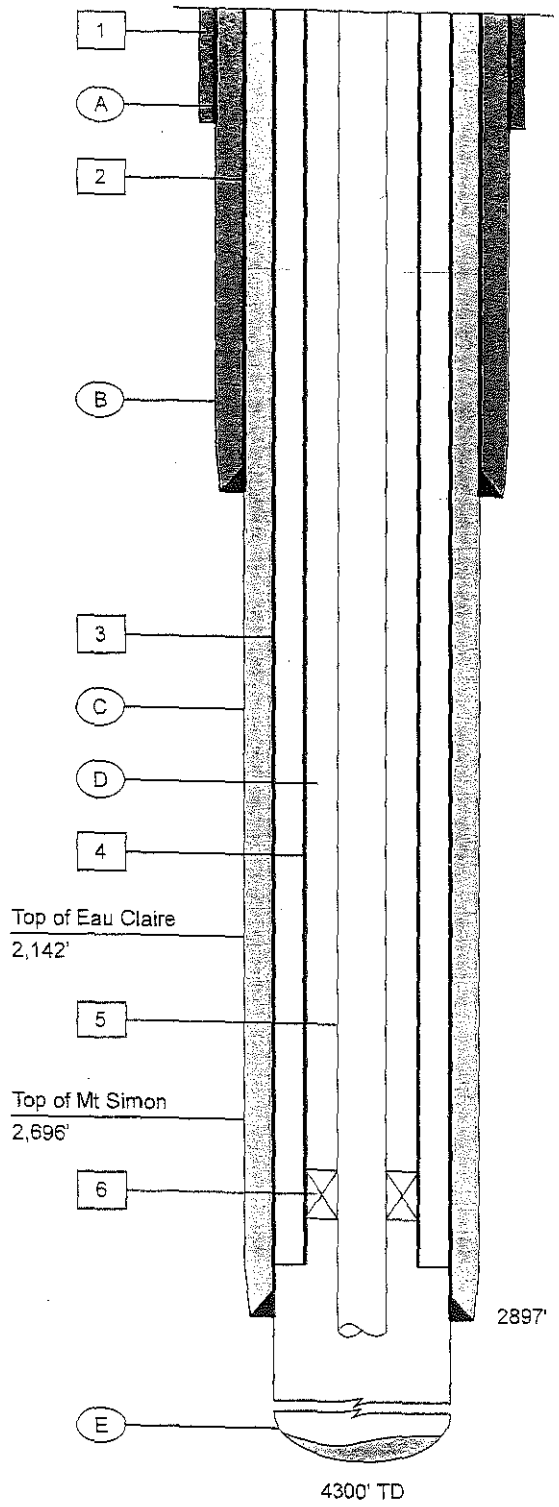
[3] Protection Casing: 9 5/8", O.D. Set @ 2897'.

[4] Liner: 7 5/8", 26.40 lb/ft, J-55. Set @ 2853'.
Cemented to Surface with 350 Sacks Class H.

[5] Injection Tubing: 4 1/2", 11.6 lb/ft, J-55, LTC, MMS Connections, with Tuboscope TK-99 Coating.

[6] Packer: Arrow ASI-X Alloy Packer. Packing Element @ 2841'.
2-Joints of 4 1/2" EUE Fiberglass Tailpipe to 2903'.

NOTE: All depths referenced to Kelly Bushing 15 ft. above GL
True KB 615 ft. above Sea Level.



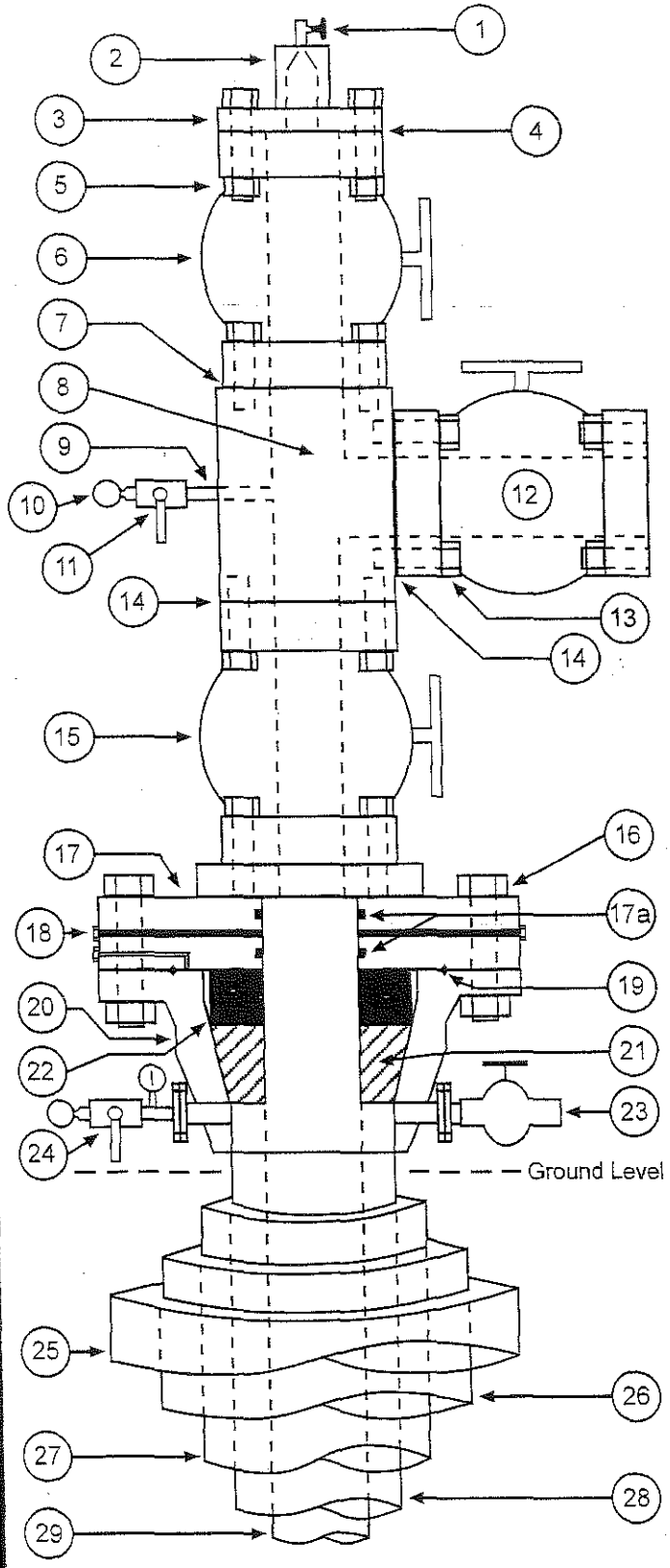
Criterion Catalysts & Technologies
Michigan City, Indiana

Figure M-1
Wellbore Diagram, Well No.1

2014 Criterion UIC Permit Re-Application

Scale: NTS	Date: September 2014	
2014_UIC_PRA_Fig_M-01.ai	By: JLM	Checked: KC

Petrotek
5995 South Zang Street, Suite 200
Littleton, Colorado 80127 USA
303-290-9414
www.petrotek.com



1 1/2" NPT Needle Valve
2 2" Plug, LP thread x 1/2" NPT
3 Flange: 4", ANSI 600 RTJ Flanged x 2" LP Threads
4 4" Series 600 gasket, 304 SS
5 4" 600 studs and nuts
6 Gate Valve: ANSI 4" 600, 316 stainless steel trim
7 4" 600 gasket, 304 SS; 4" 600 studs and nuts
8 Custom Fabricated Flow Tee: 4" ANSI 600 Flanged, 316 stainless steel trim
9 1/2" 304 stainless steel nipple
10 Pressure Gauge 2000 psi
11 1/2" 304 stainless ball valve
12 Gate Valve: ANSI 4" 600, 316 stainless steel trim
13 4" 600 studs and nuts
14 4" 600 gasket, 304 SS
15 Gate Valve: ANSI 4" 600, 316 stainless steel trim
(Top: ANSI Raised Face
Bottom: API, R-37, 316 SS Ring Gasket)
16 11" 3M studs w/ 2 nuts
17 11" 3M x 4-1/2" 600 Pack-off adapter
17a 5" P seal
18 P-Seal Injection / Bleed Port
(2) 1/2" Alemite fittings
19 API R-53 Ring joint gasket, 316 SS
20 11" 3M x 7-5/8" SOW casing head CIW
w/ (2) 2-1/16" 5M EFOs
21 7 5/8" x 5" SS slip assembly
22 10" x 5" AW slip seal plate w/ integral o-rings
(2) stainless snap rings: 5"
23 2-1/16" 5M WKM gate valve w/ handle, T-T21 trim
(2) API R-24 Ring joint gasket
(2) 2-1/16" 5M x 2" LP companion flange
2-1/16" 5M studs w/ 2 nuts
(7/8" x 6" studs w/ 2 nuts each)
24 1/2" Valves with instrumentation & gauges attached
25 20" Conductor Casing
26 13-3/8" Surface Casing
27 9-5/8" Intermediate Casing
28 7-5/8" Liner Casing
29 5" Stainless Steel Landing Joint
Connected to Coated Injection Tubing

Note: *RTJ=Ring Type Joint (ANSI)

Not an engineering drawing

Basis:
1) 1991 Golden-Strata original design and original as-built schematic.
2) 1994 Permit Schematic.
3) Petrotek files from most recent casing / tubing / packer repair project (current completion).

Criterion Catalysts & Technologies
Michigan City, Indiana

Figure M-4
Wellhead Schematic, Well No.1

2014 Criterion UIC Permit Re-Application

Scale: NTS	Date: September 2014	
2014_UIC_PRA_Fig_M-04.ai	By: JLM	Checked: WJ

Petrotek
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ATTACHMENT F
SOURCE AND ANALYSIS OF WASTE

UIC WASTE ANALYSIS PLAN

Class I Deepwell
Permit Re-Application

for

Criterion Catalysts & Technologies L.P.

Existing Class I Deepwells WDW Nos. 1 and 2;
EPA Permit # IN-091-1I-0001
EPA Permit # IN-091-1I-0002

New Well No. 3;
EPA Permit # IN-091-1I-0006

Michigan City, Indiana

September 2014

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1.0 INTRODUCTION

1.A Background

The purpose of this Waste Analysis Plan (WAP) is to characterize the non-hazardous industrial waste water injected into Criterion Catalysts & Technologies, L.P. (Criterion) active WDW No. 1, WDW No. 2 and proposed WDW No. 3 at the Michigan City, Indiana facility. Criterion will be responsible for implementing this WAP. UIC Well No.1 and UIC Well No. 2 were constructed in 1990 and 1991, respectively, and both began operating in 1991. Waste is injected into the Mt. Simon formation at depths between approximately 2,891 and 4,300 feet in UIC Well No. 1 and between approximately 2,928 and 4,200 feet in UIC Well No. 2. UIC Well No. 3 is proposed for similar future use. The two existing wells are currently operating as permitted, non-commercial Class I industrial disposal wells dedicated to disposal of alumina and catalyst manufacturing plant waste and related water.

Criterion operates the wells consistent with Title 40 of the Code of Federal Regulations (40 CFR), Section 146.13 that requires operators of Class I underground injection wells to monitor and analyze the fluids injected into the well "to yield representative data of their characteristics." This waste analysis plan also fulfills the specifications at 40 CFR 146.68 by presenting parameters for which the waste will be analyzed, methods that will be used to test for these parameters, and methods that will be used to obtain representative samples of the waste to be analyzed.

1.B Sources

The Criterion Catalysts & Technologies L.P. Michigan City, Indiana plant manufactures alumina powder, alumina-silica powders, and hydro-treating catalysts used for petroleum refining. Manufacture of these products is identified under SIC Code 2819.

Aluminum Oxide Trihydrate (AOT) is used at the plant. AOT is reacted with sulfuric acid and caustic soda to form aluminum sulfate and sodium aluminate. The aluminum sulfate and the sodium aluminate are reacted to form alumina (aluminum oxide monohydrate). The alumina slurry is then filtered, washed, and dried to produce alumina powder. The alumina-silica powders manufactured in the plant are produced in a similar manner to the alumina powders with the exception that silica is introduced by the addition of sodium silicate in the process. Hydro-treating catalysts are produced from the alumina and alumina-silica powders by first producing a shaped substrate (from the powder), then adding varying amounts of metal solutions in proprietary ratios, drying, and then calcining the finished catalysts.

The waste waters produced at this facility include, but are not limited to: process water from the manufacturing operation that includes waters produced from the reaction of aluminum sulfate with sodium aluminate and the production of aluminum oxide and silica powders and catalysts; miscellaneous tank and flow area washdown water; cooling water; non-hazardous fluids used for the purpose of waste treatment; and rainwater. The waste stream contains a consistent number of compounds because the source of injected wastewater occurs from the above reactions despite a number of different products being manufactured. Criterion may also inject two secondary sources of wastewater in the disposal wells. These include: 1) non-hazardous fluids derived from contaminated ground water and 2) uncontaminated ground water derived from dewatering. In addition, non-hazardous fluids derived from plant waste treatment may be injected into the well.

Liquid wastes generated as a result of equipment and production area clean up and from manufacturing operations are collected and pumped to the plant wastewater treatment facility. This system consists of tanks used for equalization and pH adjustment, clarification, and equipment that is used for pressure filtration. Reverse osmosis (Ro) treatment to further concentrate dilute brines may be used with permeate returned to the plan for re-use. Following treatment, the wastewater is stored in surge tanks prior to being pumped to the injection wells. The wastewater is typically pumped through the treatment system at average flow rates of 100 to 450 gpm.

Waste water is first accumulated and collected in a 20,000-gallon tank for the first stage of pH adjustment. Liquids are mixed by turbine agitators and treated with a feed of 20% NaOH or 25% H2SO4. The addition of NaOH and H2SO4 is controlled by automated control valves. The neutralized wastewater is then pumped to a 56,000-gallon tank for the second stage of neutralization if necessary. The neutralization treatment is designed to adjust the pH of the wastewater to approximately 7 +/- 1.0 pH units. Following pH adjustment, the wastewater is pumped into an inclined gravity plate (Lamella) clarifier. This filtration process removes the bulk of the remaining alumina solids from the stream. The solids are recycled back into the production process. The effluent from the plate clarifier is pumped under pressure through leaf filters which have been pre-coated with a filter aid. The wastewater is then pumped through a set of bag and cartridge/polish filters to reduce the size and concentration of solids that might otherwise be injected into the disposal wells. The bag filter currently consists of one unit containing 12 polypropylene felt bags typically rated at 1 micron (nominal). The cartridge/polish filtration system consists of 4 units containing 36 cartridges per unit. These units currently contain polypropylene cartridges (typically 0.5 micron pore size). For dilute brines, an Ro may be used at this stage to recover some fresh water. The effluent is then pumped into storage tanks prior to injection. Injection pumps deliver the filtered waste to the wells under positive injection pressure in accordance with applicable UIC permits. Alterations to the waste water treatment systems may be

completed as needed and are not considered to be part of the UIC permit.

1.C Summary

The major components of the Criterion waste characterization and UIC monitoring program include:

- Volume Monitoring
- Sampling and Analysis
- Quality Assurance/Quality Control

These components are addressed in Sections 2 and 3, below.

The WAP may be reviewed and, if necessary, revised if new waste constituents are identified that may significantly alter the physical properties of the waste. Revisions to the WAP may also be required if new permit conditions are added by the Agency for cause. Any future revisions to the WAP, upon approval, will become part of the administrative record and constitute a modification of the permit. Compatibility issues regarding the subsurface rock matrix and well construction materials were previously quantified and documented in the 1994 and 2004 permit re-applications and are not addressed in this WAP.

2.0 PROCEDURES

2.A Volume Monitoring

As discussed in the text of the 2003 Permit Re-application, 2009 Permit Re-application for Well No. 3, and the 2014 Permit Re-application for Well Nos. 1, 2, and 3, flow and pressure recorders continuously monitor injection pressure, annulus pressure, flow rate and totalized cumulative volumes for the wells. A summary of recorded data will be provided to the US EPA per applicable permit requirements. The remaining portions of this WAP address physical and chemical characterization of the waste.

2.B Waste Characterization

Waste analysis parameters were selected based on process knowledge and historical analysis that identified the few chemical constituents and representative physical parameters present in the wastewater. These parameters include pH, TDS, TSS, and inorganic parameters such as sodium oxide and sulfate. A continuous recording pH meter is installed in the waste stream in the pretreatment facility. The pH is maintained between 5 and 9 and is an important indicator of treatment facility operation. The total dissolved solids (TDS) concentration of the waste is a also useful indicator of fluid properties. Total suspended solids (TSS), or particulates in the waste stream are predominantly aluminum and silica oxides. The suspended solids present in the injection stream have passed through a pressure filter and a guard filter and are less than 1 micron. Particles in this size range will have little impact on the formation. Weekly observation of the waste sampling system by visual inspection to verify sample clarity before sample compositing will confirm that the filtration systems are operating. Sodium sulfate is the primary constituent of the waste stream and, therefore, sodium is the predominant cation. Sulfate is the predominant anion. Because the injection formation native fluid contains high concentrations of calcium ions, which could precipitate as calcium sulfate if sulfate-rich injectate is encountered, the wells were buffered with fresh water to reduce the potential for contact between the injection fluid and the formation fluid within the immediate vicinity of the wellbore. Due to the significant volume of historic injection, little connate brine remains in the formation in the vicinity of the wells.

Because only a few chemical constituents are present in the injectate, analysis for the comprehensive annual waste characterization analytical suite suggested by USEPA UIC Region 5 Guidance Document No. 8 is not necessary. For example, the Criterion injectate does not contain pesticides or herbicides and wastewaters contain no organic and chlorinated compounds because they are not employed in any production processes at the Criterion plant. Corrosivity is the only hazardous

waste characteristic that the wastewater/injectate may exhibit, and Criterion monitors the pH of the injectate on a continual basis to ensure the pH is maintained between approximately 5 and 9. Pretreatment of the wastewater/injectate involves pH adjustment to approximately 7 +/- 1.0 pH units. Sampling of the pretreated wastewater prior to injection verifies that the pH does not exceed non-hazardous ranges and that the monitoring equipment and neutralization process is functioning properly.

Table 2-1 of the following section lists the parameters and monitoring frequency used to characterize wastewater under the Criterion Class I well permits (IN-091-1I-0001, IN-091-1I-0002 and IN-091-1I-0005). The table also summarizes the applicable analytical method and reporting units for each parameter. Characterization parameters were selected based on process knowledge from plant operations information, historical analytical data, and the dominant chemical constituents common in both the raw and finished materials handled by systems at the site that could generate waste managed in the deepwells. Constituents identified for characterization satisfy regulatory requirements and applicable specifications listed in the UIC permits.

2.C Sampling and Analysis

Temperature is monitored daily, and pH is monitored on a continual basis. For daily characterization and continuously monitored parameters, a probe will be used that provides equal or greater data frequency and accuracy compared to daily grab sampling. Daily and continuous monitoring will be performed each day that injection of waste takes place, meaning that injectate monitoring will not be conducted on those days that waste is not injected.

For those parameters that require sampling and analysis on a monthly basis, this sampling will take place a minimum of once/month as a composite sample when injection of waste takes place. The waste analysis to be conducted is designed to acquire representative samples of typical injectate. Criterion personnel or contracted analytical laboratory personnel will collect required on-site waste stream samples. Sampling procedures will be conducted at the direction of Criterion and in accordance with the certified or accredited analytical laboratory procedures, and will meet the minimum current standard US EPA procedures. Samples are collected from the suction side of the injection system between the final post-treatment injectate storage tank and the booster pump. A programmable sampler is used to open a sample valve for a few seconds every hour, depositing the sample in a collection vessel. A composite sample will be collected at a minimum frequency of once per month and will be sent to an independent contract laboratory for analysis. Sufficient treatment, mixing and residence time in the system have occurred at this sampling point for the waste to be representative of the waste stream that is being

injected in all active well(s). The sampler's name, sampling point, and date sampled will be documented.

Table 2-1 presents the parameters, analytical methods, equipment, reporting unit and sample frequency for each test parameter. Sampling and analytical methods will meet or exceed the standards cited below or as presented in USEPA "Methods for the Chemical Analysis of Water and Wastes" or "Standard Methods for the Examination of Water and Wastewater".

TABLE 2-1
CRITERION CATALYSTS & TECHNOLOGIES L.P.; MICHIGAN CITY, INDIANA
CLASS I WASTE SAMPLING AND ANALYSIS SUMMARY

Test Parameter	Analytical Method	Equipment	Reporting Units	Frequency
pH	N/A	Probe	pH units	Continuous
Temperature	N/A	Probe	deg. F.	Daily
pH	EPA 150.1	Titration	pH units	Monthly
Total Dissolved Solids)	USEPA 160.1	ICP Atomic Emission Spectrometer	mg/L	Monthly
Total Suspended Solids	USEPA 160.2	ICP Atomic Emission Spectrometer	mg/L	Monthly
Sulfate (SO4)	USEPA A1000	ICP Atomic Emission Spectrometer	mg/L	Monthly
Aluminum Oxide (ALO3)	USEPA 200.7/6010	ICP Atomic Emission Spectrometer	mg/L	Monthly
Sodium Oxide (NaO2)	USEPA 200.7/6010	ICP Atomic Emission Spectrometer	mg/L	Monthly
Silica (SiO2)	USEPA 200.7/6010A	ICP Atomic Emission Spectrometer	mg/L	Monthly

Notes: * reporting limits may be higher than standard method reference due to required sample dilution by laboratory.
** analytical method = cited or alternate EPA method with equal or greater detection limit than standard for method cited.

3.0 QUALITY ASSURANCE/QUALITY CONTROL

3.A General Sampling and Analytical Information

Sampling protocols outlined in this document are to be followed. Criterion will adhere to guidelines set forth in the referenced standards listed in Section 2.C or equivalents, as appropriate. Approved sample collection vessels and preservation techniques from 40 CFR 136.3 or equivalent will be followed as applicable and appropriate. These will include preservation in plastic or glass sample containers provided by the laboratory and storage in a sample refrigerator or cooler for shipment to the laboratory. Criterion reserves the option to choose alternate laboratories for testing provided equivalent QA/QC standards are met.

COC Form Content

Each sample taken will be accompanied by a Criterion or contract laboratory Chain of Custody (COC) form that provides a record of sample handling starting with sample acquisition, documenting the process up to laboratory analysis. Samples taken are to be logged in the field using the COC, sealed, and delivered to the laboratory with a COC form. The COC form shall provide the following items collected by the sampler:

1. Sample ID including code or name, in addition to date and time
2. Name of sample collector; (include sampling company name if not Criterion);
3. Sample collection method;
4. Sample collection date; and
5. Sample collection point.

Sample container label will also include a COC seal. Sample chain-of-custody will be followed at all times during the sampling and subsequent analysis. Chain-of-custody will be used to document the handling and control necessary to identify and trace a sample from collection through to final analytical results. Standard laboratory COC forms that document the times and dates of all personnel handling the sample, along with standard labels and container seals sufficient to distinguish between samples and prevent tampering, will be acceptable.

Reporting and Records Retention

Analytical reports and regulatory submittals regarding the nature and composition of injected fluids are to be maintained in the well files until authorization is obtained from US EPA, in writing, to discard the records. All laboratory reports submitted to US EPA will include, at a minimum, the following:

1. Test description;
2. Analytical method for parameter detection;

3. Identification of analysis date and analyst;
4. Result and units; and
5. Analytical reporting limits.

The following sections present QA/QC parameters which will be followed to help to assure the adequacy of the sampling and analytical techniques for wellhead sampling and analysis described in this plan.

3.B Sampling Controls

1. Equipment Blanks

Fluid samples will be obtained directly from the sample accumulation container before being sealed in the sample container shipped to the laboratory. In this case, no equipment cleaning blanks will be required. If samples cannot be directly placed in the bottles intended for preservation and shipment, equipment blanks will be taken as deemed appropriate by Criterion.

2. Trip Blanks

If the laboratory analysis is ever suspect because it contains anomalous parameters, trip blanks will be collected to assess in-transit contamination. The trip blank will consist of sample containers filled and sealed at the laboratory with Type II reagent grade water that accompany the sample containers used throughout the sampling event. The sample containers shall be handled in the same manner as the samples. The trip blank(s) will be sent to the laboratory for analysis of, at a minimum, the same parameters specified in the sampling plan above. A minimum of one (1) trip blank per sampling event will be utilized, when deemed necessary. At the discretion of Criterion, trip blanks may be submitted with any sample to verify representativeness of the sampling program.

3. Sample Duplicates

On advance written request of US EPA, duplicate samples will be taken to further assess the QA/QC program of the laboratory conducting the analysis. Such samples will be drawn from the same site from which primary samples will be taken consecutively from the same sampling tap or sample location to ensure representativeness. The duplicate will be labeled with a sample number that will not conflict with the other samples, but will not be discernable to the laboratory as a duplicate sample. Upon the request of US EPA or at the discretion of Criterion representatives, one duplicate sample per selected sampling event will be taken and analyzed for the same parameters as the sampling event.

3.C Analytical Controls

1. Equipment Calibration

Criterion requires that the selected analytical laboratories maintain QA/QC records of the frequency and type of instrument calibration performed at the laboratory and in the field. Any calibration of thermometers, gauges, chromatographs, spectrometers and other analytical equipment will be conducted according to appropriate instrument manufacturer specifications and manufacturer recommended frequencies or as dictated by applicable laboratory QA/QC plans that have been developed by the laboratory.

2. Data Reduction

Transcription of the raw data into the reportable units is conducted by the laboratory in accordance with the selected laboratory Q/A plan. Data reduction utilized in the analysis and reporting process is presented in the reports to the US EPA for each sampling and analysis event. Data is recorded on hand written or computer work sheets that include identification data, sample data and all data required for calculations, or on computer print-outs accompanied by operator notes and summaries.

3. Data Verification

Data verification is conducted after each sampling event by assigned laboratory personnel and includes, at a minimum, review of chain-of-custody forms, equipment calibration records and data completeness. Spot checks of raw data versus reported data are performed to review math accuracy, significant numbers and reporting units. In addition, certified laboratory standard quality assurance/quality control requirements or checklists are utilized to verify individual test methods such as blanks, standards, and for comparisons of internal lab test duplicate results. Problems with any of these items will be indicated in the analytical report presented to the agency.

4. Internal Quality Control

Per the laboratory QA/QC program, certified quality control samples from appropriate commercial sources or the US EPA, are run periodically with sample batches. Internal quality control are addressed by disclosure of the laboratory's use of blanks, blind standards, matrix spikes and matrix spike duplicates, preparation of reagents, and laboratory duplicate or replicate analyses.

3.D Actions

1. Corrective Actions

Corrective actions are implemented by laboratories if the analytical or sampling methods do not achieve plan objectives or data verification identifies inconsistencies in the results. Actions may entail re-sampling the waste stream and/or re-analyzing the fluid for a particular parameter, re-calibrating an analytical device, or other appropriate actions as dictated by the specific situation encountered. Action levels are typically taken in accordance with any applicable standards from USEPA "Methods for the Chemical Analysis of Water and Wastes" or "Standard Methods for the Examination of Water and Wastewater". Criterion representatives may, at their discretion, require re-sampling and retesting to confirm results that fall outside the historical range of expected analytical results, or outside equipment calibration curves.

2. Reports to US EPA Region 5

Reports of waste analysis to US EPA will contain a table listing the sampling date, units and analytical result for each of the parameters listed in table 2-1 of this document.

3.E Re-Characterization

Criterion reviews the results of monthly analytical testing to help assure that the wastewater is sufficiently characterized. At the discretion of Criterion or at the written request of EPA, re-characterization efforts may be conducted should a significant change occur in the facility waste stream based on process knowledge, or as necessitated or required by new regulations.

The waste stream will be re-characterized as deemed necessary by Criterion whenever a new product is introduced into the system that is expected, based on process knowledge, to affect the expected waste stream composition. Any future revisions to the WAP, upon approval, will become part of the administrative record and constitute a modification of the permit.

ATTACHMENT G
SPECIAL CONDITONS RELATED TO REMOTE MONITORING

SPECIAL CONDITIONS RELATED TO REMOTE MONITORING

If this well is monitored remotely, the following special conditions shall be applicable:

For the purpose of this permit, remote monitoring is defined as injection into the well when trained personnel are not continuously present on site property during injection, or if trained personnel on-site are not dedicated to well operation and are unable to perceive shut-down alarms and able to physically respond to the well controls or the wellhead within 30 minutes of a compliance alarm condition.

1. Local operating system and remote monitoring system: If remote monitoring is to be used to operate the well, a computer operating system and/or programmable logic controller or suitable equivalent shall be on-site and shall have a back-up power supply and an automatic pager designed to alert designated on-call, off-site personnel in the event of a well alarm or shut-in. The on-call personnel shall be able to remotely access the operating system to verify well conditions and alarm status.

2. Response to alarms and automatic shut-ins: Alarm conditions related to permit compliance conditions of the well under Part II (b)(5) shall be investigated on-site by a trained operator within three (3) hours of pager notification of the occurrence.

3. Loss of power to the computer: If remote monitoring is to be used during injection, and a power failure beyond the capability of the back-up power supply shuts down the computer, power to the injection pumps for an affected well shall be automatically shut down.

4. Loss of dial tone: If the automatic pager in use while a well is being remotely monitored cannot obtain a dial tone for one (1) hour, power to the injection pumps for an affected well shall automatically be shut down.

5. Restart of the well after an automatic shut down: Restart of the well after an automatic pump shut down related to a permit condition alarm (including, but not limited to, injection pressure, annulus differential pressure, loss of pager system dial tone for more than 1 hour or computer power failure) shall require the physical presence of trained personnel to evaluate conditions at the wellhead and related equipment on-site before the well can be restarted.

6. Restart of the well after non-permit condition related or scheduled shut downs: If a well pump is shut down for more than 48 hours for circumstances unrelated to permit conditions, restart of the well shall require the physical presence of trained personnel on-site.

7. Weekly well inspections: If fluid injection occurs during the period of any week and the well is being monitored remotely, trained personnel shall physically visit the well and related equipment for the purposed of inspection at a minimum frequency of not less than once per week. This inspection shall verify the correct operation of the remote monitoring system by review of items such as, but not limited to, a comparison of the values shown on mechanical gauges with those reported by the remote operating system.