

**Wyoming Department of Environmental Quality
Water Quality Division
WYPDES Program**

Statement of Basis

MAJOR MODIFICATION

APPLICANT NAME: Pennaco Energy, Inc.

MAILING ADDRESS: 3601 Southern Drive
Gillette, WY 82718

FACILITY LOCATION: Brinkerhoff #23, Option 2, which is located in the SENE and SWNE, Section 22, and the NWSW, SWSW, and SENW, Section 23, Township 57 North, Range 83 West, Sheridan County. The produced water will be discharged to various named, on-channel reservoirs (class 3B) located on several ephemeral tributaries (class 3B) to Prairie Dog Creek (class 2AB), which is tributary to the Tongue River (class 2AB). The permit establishes a total maximum daily flow limit of 1.21 MGD, and requires that the produced water being discharged from this facility originate in one of the following formations: the Dietz1, Dietz2, Dietz3, Monarch, and/or the Carney coal seams.

NUMBER: WY0051489

This permit modification was revised following its public notice period. Outfall 005 has been determined by WDEQ to be located less than one stream mile from a class 2 water body (Prairie Dog Creek). The effluent limits and monitoring requirements for outfall 005 are updated accordingly in the permit. All of the outfalls authorized under this permit are located less than one stream mile from Prairie Dog Creek.

This permit is hereby modified as follows:

- 1) *Update effluent limits for dissolved iron, chlorides, pH and total recoverable arsenic to reflect current water quality standards and applicable anti-degradation calculations.*
- 2) *Remove effluent limits for total petroleum hydrocarbons and total recoverable aluminum, plus updated effluent limit for total recoverable radium in accordance with current CBM permitting practice.*
- 3) *Reduce monitoring frequency for alkalinity and bicarbonate from monthly to annually in accordance with current CBM permitting practice.*
- 4) *Increase monitoring frequency for dissolved iron from annually to quarterly, based on effluent history at this facility.*
- 5) *Update outfall locations to reflect as-built conditions.*

All other terms and conditions of WYPDES permit WY0051489, including Parts II and III of the original permit, shall remain unchanged and in full force and effect.

Permit effluent limits are based on federal and state regulations and are effective as of the date of issuance. The permit limits specific conductance to 7,500 micromhos/cm, total dissolved solids to 5,000 mg/l, and the pH must remain within 6.5 and 9.0 standard units. These effluent limits are based on standards in Chapter 2 of the Wyoming Water Quality Rules and Regulations. In addition, the permit establishes a total recoverable radium 226+228 effluent limit of 2 pCi/, a dissolved manganese limit of 50 µg/l, a total recoverable barium limit of 1800 µg/l, a total recoverable arsenic limit of 4.6 µg/l, a dissolved iron effluent limit of 131 µg/l, a chlorides limit of 97 mg/l, and a dissolved zinc limit of 33 µg/l. These limits are based on chronic aquatic life standards for class 2AB waters which are intended to protect for the above listed designated uses and reflect the application of the antidegradation provisions required under Chapter 1 of the Wyoming Water Quality Rules and Regulations.

Kathy Shreve
Water Quality Division
Department of Environmental Quality
Drafted: March 2, 2004

Major Modification: Drafted December 14, 2007; Jason Thomas

MODIFICATION OF AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, (hereinafter referred to as "the Act"), and the Wyoming Environmental Quality Act,

Pennaco Energy, Inc.

is authorized to discharge from the wastewater treatment facilities serving the

Brinkerhoff #23, Option 2,

which is located in the

SENE and SWNE, Section 22, and the NWSW, SWSW, and SENW, Section 23, Township 57 North, Range 83 West, Sheridan County,

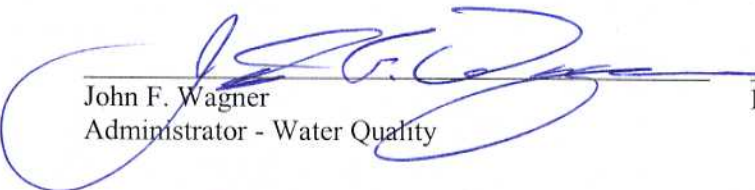
to receiving waters named

various named, on-channel reservoirs (class 3B) located on several ephemeral tributaries (class 3B) to Prairie Dog Creek (class 2AB), which is tributary to the Tongue River (class 2AB)

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II and III hereof.

This permit originally became effective on June 8, 2004. This major modification to the permit shall become effective on the date of signature by the Director of the Department of Environmental Quality.

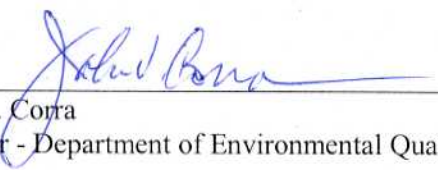
This permit and the authorization to discharge shall expire **April 30, 2009**, at midnight .



John F. Wagner
Administrator - Water Quality

Date

2/4/08



John V. Corra
Director - Department of Environmental Quality

Date

2/4/08

PART IA. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Effective immediately and lasting through April 30, 2009, the quality of effluent discharged by the permittee shall, at a minimum, meet the limitations set forth below. The permittee is authorized to discharge from outfalls(s) serial numbers 001 - 006.

1. Such discharges shall be limited as specified below:

a. Effluent Limits at Outfalls 001 – 006

<u>Effluent Characteristic</u>	<u>Effluent Limits</u>	<u>Daily Maximum</u> <u>Outfall</u>
Chlorides, mg/l		97
Dissolved Iron, µg/l		131
Dissolved Manganese, µg/l		50
pH, standard units		6.5 – 9.0
Specific Conductance, micromhos/cm		7500
Sulfates, mg/l		3000
Total Recoverable Arsenic, µg/l		4.6
Total Recoverable Barium, µg/l		1800
Total Dissolved Solids, mg/l		5000
Total Recoverable Radium 226 + 228, pCi/l		2
Total Flow, MGD**		1.21
Dissolved Zinc, µg/l		33

**Total flow is to be calculated as the sum of all discharge from all permitted outfalls. The permit requires that the produced water being discharged by this facility originate on or more of the following formations: the Dietz1, Dietz2, Dietz3, Monarch, and/or Carney coal seams.

The permittee is required to contain all effluent within the reservoirs, and may not discharge except during periods of time in which stormwater runoff enters the reservoir, causing it to overtop and spill. Should the reservoirs discharge, the permittee will be required to substantiate that the discharge was due to the influx of stormwater runoff.

The permittee may, if so desired, discharge effluent from any authorized well to any permitted outfall, as long as all permit limits and requirements can be met.

Information gathered from the water quality monitoring stations may result in modification of the permit to protect existing uses on the tributary and the mainstem.

There shall be no discharge of floating solids or visible foam in other than trace amounts, nor shall the discharge cause formation of a visible sheen or visible hydrocarbon deposits on the bottom or shoreline of the receiving water.

All waters shall be discharged in a manner to prevent erosion, scouring, or damage to stream banks, stream beds, ditches, or other waters of the state at the point of discharge. In addition, there shall be no deposition of substances in quantities which could result in significant aesthetic degradation, or degradation of habitat for aquatic life, plant life or wildlife; or which could adversely affect public water supplies or those intended for agricultural or industrial use.

2. Discharges shall be monitored by the permittee as specified below:

a. Monitoring of the initial discharge

Note: The initial monitoring requirement outlined below will not apply to outfalls which have already been sampled and reported for these parameters under previous permit coverage.

Within 60 days of commencement of discharge following issuance of this permit modification, a sample shall be collected from each outfall and analyzed for the constituents specified below, at the required detection limits. Within 120 days of commencement of discharge following issuance of this permit modification, a summary report on the produced water must be submitted to the Wyoming Department of Environmental Quality and the U.S. EPA Region 8 at the addresses listed below. This summary report must include the results and detection limits for each of the constituents listed below. In addition, the report must include written notification of the established location of the discharge point (refer to Part I.B.11). This notification must include a confirmation that the location of the established discharge point(s) is within 1,510 feet of the location of the identified discharge point(s), is within the same drainage, and discharges to the same landowner's property as identified on the original application form. The legal description and location in decimal degrees of the established discharge point(s) must also be provided. After receiving the monitoring results for the initial discharge, the routine monitoring requirements described in Parts I.A.7.b. and I.A.7.c. may be modified to require more stringent monitoring.

<u>Parameter*</u> (See notes following the table on chemical states)	<u>Required Detection Limits and Required Units</u>
Alkalinity, Total	1 mg/l as CaCO ₃
Aluminum, Dissolved	50 µg/l
Arsenic, Total Recoverable	1 µg/l
Barium, Total Recoverable	100 µg/l
Bicarbonate	10 mg/l
Cadmium, Dissolved	5 µg/l
Calcium, Dissolved	50 µg/l, report as mg/l
Chlorides	5 mg/l
Copper, Dissolved	10 µg/l
Dissolved Solids, Total	5 mg/l
Hardness, Total	10 mg/l as CaCO ₃
Iron, Dissolved	50 µg/l
Lead, Dissolved	2 µg/l
Magnesium, Dissolved	100 µg/l, report as mg/l
Manganese, Dissolved	50 µg/l
Mercury, Dissolved	1 µg/l
pH	to 0.1 pH unit
Radium 226, Total Recoverable	0.2 pCi/l
Radium 228, Total Recoverable	0.2 pCi/l
Selenium, Total Recoverable	5 µg/l
Sodium Adsorption Ratio	Calculated as unadjusted ratio
Sodium, Dissolved	100 µg/l, report as mg/l
Specific Conductance	5 micromhos/cm
Sulfates	10 mg/l
Zinc, Dissolved	50 µg/l

Initial monitoring reports are to be sent to the following addresses:

Planning and Targeting Program, 8ENF-PT
Office of Enforcement, Compliance, and Environmental Justice
U.S. EPA Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

and

Wyoming Department of Environmental Quality
 Water Quality Division
 Herschler Building, 4 West
 122 West 25th Street
 Cheyenne, WY 82002

b. Routine monitoring End of Pipe – 001 – 006

For the duration of the permit, at a minimum, samples for the constituents described below shall be collected at the indicated frequencies. The first routine monitoring for the time frame during which the monitoring of initial discharge occurs will, at a minimum, consist of flow measurements for the duration of the six-month monitoring time frame. Monitoring will be based on semi-annual time frames, from January through June, and from July through December.

<u>Parameter</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Bicarbonate	Annually	Grab
Dissolved Calcium	Monthly	Grab
Chloride	Annually	Grab
Dissolved Iron	Quarterly	Grab
Dissolved Manganese	Annually	Grab
Dissolved Magnesium	Monthly	Grab
pH	Once Every Six Months	Grab
Total Recoverable Radium 226 + 228	Annually	Grab
Dissolved Sodium	Monthly	Grab
Sodium Adsorption Ratio	Monthly	Calculated
Specific Conductance	Monthly	Grab
Sulfate	Annually	Grab
Total Alkalinity	Annually	Grab
Total Recoverable Arsenic	Annually	Grab
Total Recoverable Barium	Annually	Grab
Total Flow - (MGD)	Monthly	Continuous
Dissolved Zinc	Annually	Grab

c. Water Quality Monitoring Stations **TRIB1, TRIB2, TRIB3, UPDC, DPDC**

For the duration of the permit, at a minimum, samples for the constituents described below shall be collected at the indicated frequencies. Monitoring will be based on monthly time frames, and reported semiannually.

<u>Parameter</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Dissolved Calcium	Monthly	Grab
Dissolved Magnesium	Monthly	Grab
Dissolved Sodium	Monthly	Grab
Sodium Adsorption Ratio	Monthly	Calculated
Specific Conductance	Monthly	Grab
Flow	Monthly	Instantaneous

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: designated water quality monitoring stations identified as TRIB1, TRIB2, TRIB3, UPDC, and DPDC in Table 1 of the permit below.

Established water quality monitoring stations on the mainstem are to be located outside the mixing zone with the tributaries and the mainstem. Monthly water quality samples are to be collected at any tributary station (TRIB1 – TRIB3) when effluent from this CBM facility reaches that station. When one or more tributary stations is sampled during a calendar month, the UPDC and DPDC stations will also be sampled during that sampling event. If flow occurs at station(s) TRIB1 – TRIB3 during a given monthly monitoring period, but this CBM facility did not contribute to that flow, the permittee will report “did not contribute” in the discharge monitoring reports for that monthly monitoring period. Under such circumstances, sampling is not required at the water quality monitoring stations, and it will be the responsibility of the permittee to demonstrate that the effluent from this facility did not contribute to the flow occurring at any of the tributary stations. If no flow at all occurs at any of tributary stations (TRIB1-TRIB3) for an entire monthly monitoring period, then “no flow” is to be reported and samples need not be collected at any of the water quality monitoring stations for that monthly monitoring period.

B. MONITORING AND REPORTING

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring

points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and approval by, the permit issuing authority.

2. Reporting

Results of initial monitoring, including the date the discharge began, shall be summarized on a Monitoring Report Form for Monitoring of Initial Discharge and submitted to the state water pollution control agency at the address below postmarked no later than 120 days after the commencement of discharge.

Results of routine end of pipe and water quality station monitoring during the previous six (6) months shall be summarized and reported semiannually on a Discharge Monitoring Report Form (DMR). If the discharge is intermittent, the date the discharge began and ended must be included. The information submitted on the first semiannual DMR shall contain a summary of flow measurements and any additional monitoring conducted subsequent to the submittal of the initial monitoring report. When required, whole effluent toxicity (biomonitoring) results must be reported on the most recent version of EPA Region VIII's Guidance for Whole Effluent Reporting. Monitoring reports must be submitted to the state water pollution control agency at the following address postmarked no later than the 15th day of the second month following the completed reporting period. The first report following issuance of this modification is due on August 15, 2008.

Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the Signatory Requirements contained in Part II.A.11.

Wyoming Department of Environmental Quality
Water Quality Division
Herschler Building, 4 West
122 West 25th Street
Cheyenne, WY 82002
Telephone: (307) 777-7781

If no discharge occurs during the reporting period, "no discharge" shall be reported. If discharge is intermittent during the reporting period, sampling shall be done while the facility is discharging.

3. Definitions

- a. The "monthly average" shall be determined by calculating the arithmetic mean (geometric mean in the case of fecal coliform) of all composite and/or grab samples collected during a calendar month.
- b. The "weekly average" shall be determined by calculating the arithmetic mean (geometric mean in the case of fecal coliform) of all composite and/or grab samples collected during any week.
- c. The "daily maximum" shall be determined by the analysis of a single grab or composite sample.

- d. "MGD", for monitoring requirements, is defined as million gallons per day.
- e. "Net" value, if noted under Effluent Characteristics, is calculated on the basis of the net increase of the individual parameter over the quantity of that same parameter present in the intake water measured prior to any contamination or use in the process of this facility. Any contaminants contained in any intake water obtained from underground wells shall not be adjusted for as described above and, therefore, shall be considered as process input to the final effluent. Limitations in which "net" is not noted are calculated on the basis of gross measurements of each parameter in the discharge, irrespective of the quantity of those parameters in the intake waters.
- f. A "composite" sample, for monitoring requirements, is defined as a minimum of four grab samples collected at equally spaced two hour intervals and proportioned according to flow.
- g. An "instantaneous" measurement for monitoring requirements is defined as a single reading, measurement, or observation.
- h. A "pollutant" is any substance or substances which, if allowed to enter surface waters of the state, causes or threatens to cause pollution as defined in the Wyoming Environmental Quality Act, Section 35-11-103.
- i. "Total Flow" is the total volume of water discharged, measured on a continuous basis and reported as a total volume for each month during a reporting period. The accuracy of flow measurement must comply with Part III.A.1.

4. Test Procedures

Test procedures for the analysis of pollutants, collection of samples, sample containers, sample preservation, and holding times, shall conform to regulations published pursuant to 40 CFR, Part 136, unless other test procedures have been specified in this permit.

5. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

- a. The exact place, date and time of sampling;
- b. The dates and times the analyses were performed;
- c. The person(s) who performed the analyses and collected the samples;
- d. The analytical techniques or methods used; and
- e. The results of all required analyses including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine the results.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form. Such increased frequency shall also be indicated.

7. Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the administrator at any time. Data collected on site, copies of Discharge Monitoring Reports and a copy of this NPDES permit must be maintained on site during the duration of activity at the permitted location.

8. Penalties for Tampering

The Act provides that any person who falsifies, tampers with or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or both.

9. 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 no later than 14 days following each schedule date.

10. Facility Identification

All facilities discharging produced water shall be clearly identified with an all-weather sign posted at each outfall and flow monitoring locations (points of compliance). This sign shall, as a minimum, convey the following information:

- a. The name of the company, corporation, person(s) who holds the discharge permit, and the NPDES permit number;
- b. The contact name and phone number of the person responsible for the records associated with the permit;
- c. The name of the facility (lease, well number, etc.) and the outfall number as identified by the discharge permit.

11. Identification and Establishment of Discharge Points

According to 40 CFR 122.21(k)(1), the permittee shall identify the expected location of each discharge point on the appropriate NPDES permit application form. The location of the discharge point must be identified to within an accuracy of 15 seconds. This equates to a distance of 1,510 feet.

Public notice is not required if the location of the established discharge point is within 1,510 feet of the location of the discharge point originally identified on the permit application. In addition, the discharge must be within the same drainage and must discharge to the same landowner's property as identified on the original application form. If the three previously stated requirements are not satisfied, modification of the discharge point location(s) constitutes a major modification of the permit as defined in Part I.B.12. The permittee shall provide written notification of the establishment of each discharge point in accordance with Part I.A.2.a above.

12. Location of Discharge Points and Irrigation Compliance Points

As of the date of permit issuance, authorized points of discharge were as follows:

SEE TABLE 1 FOR A LIST OUTFALLS

13. Location of water quality monitoring stations

As of the date of issuance, authorized water quality monitoring stations were as follows:

SEE TABLE 1 FOR A LIST OF WATER QUALITY MONITORING STATIONS

Table 1: WY0051489 - Brinkerhoff 23 Option 2

Out-fall	Qtr/Qtr	SECTION	TWP (N)	RNG (W)	LATITUDE	LONGITUDE	Drainage / Description	Groundwater approval required prior to Discharge?	Reservoir Bond to WDEQ Required prior to Discharge?
001*	NWSW	23	57	83	44.89839	-106.84203	Discharges to on-channel reservoir "Brinkerhoff" located in unnamed ephemeral tributary to Krenzien Draw, trib to Prairie Dog Creek	NO	YES
002	SWSW	23	57	83	44.89586	-106.83994	Discharges to on-channel reservoir "Lonetree" located in Krenzien Draw, trib to Prairie Dog Creek	NO	YES
003	SENE	22	57	83	44.90374	-106.84503	Discharges to on-channel reservoir "Little Draw" located in unnamed ephemeral tributary to Prairie Dog Creek	NO	YES
004	SENW	23	57	83	44.90464	-106.83837	Discharges to on-channel reservoir "Lost Lariat" located in unnamed ephemeral tributary to Krenzien Draw, trib to Prairie Dog Creek	NO	YES
005	SENE	22	57	83	44.90254	-106.84410	Discharges to on-channel reservoir "Prairie Puppy" located in unnamed ephemeral tributary to Prairie Dog Creek	NO	YES
006	SWNE	22	57	83	44.90379	-106.84755	Discharges to on-channel reservoir "Railroader" located in unnamed ephemeral tributary to Prairie Dog Creek	NO	YES
TRIB1	NWSE	22	57	83	44.89876	-106.85066	Tributary monitoring station on unnamed ephemeral tributary. Serves outfalls 003, 005	N/A	N/A
TRIB2	NWNE	22	57	83	44.90536	-106.85446	Tributary monitoring station on unnamed ephemeral tributary. Serves outfall 006	N/A	N/A
TRIB3	SWSE	22	57	83	44.89666	-106.85067	Tributary monitoring station on Krenzien Draw. Serves outfalls 001, 002, 004	N/A	N/A
UPDC	SESE	27	57	83	44.88196	-106.84772	Upstream Prairie Dog Creek monitoring station (above facility)	N/A	N/A
DPDC	NWNW	15	57	83	44.92166	-106.86072	Downstream Prairie Dog Creek monitoring station (below facility)	N/A	N/A

*Note: Asterisk denotes outfalls for which WDEQ has field-verified the Latitude and Longitude locations. These are considered to be the most accurate location data available for these outfalls, and will supersede Latitude and Longitude values presented in the application.

Requests for modification of the above list will be processed as follows. If the requested modification satisfies the definition of a minor permit modification as defined in 40 CFR 122.63 modifications will not be required to be advertised in a public notice. A minor modification constitutes a correction of a typographical error, increase in monitoring and/or reporting, revision

to an interim compliance schedule date, change in ownership, revision of a construction schedule for a new source discharger, deletion of permitted outfalls, and/or the incorporation of an approved local pretreatment program.

A request for a minor modification must be initiated by the permittee by completing the form titled National Pollutant Discharge Elimination System Permit Modification Application For Coal Bed Methane. Incomplete application forms will be returned to the applicant.

The outfalls listed in the above table may be moved from the established location without submittal of a permit modification application provided all of the following conditions are satisfied:

1. The new outfall location is within 2640 feet of the established outfall location.
2. The new outfall location is within the same drainage or immediate permitted receiving waterbody.
3. There is no change in the affected landowners.
4. Notification of the change in outfall location must be provided to the NPDES Permits Section on a form provided by the WQD Administrator within 10 days of the outfall location change. The form must be provided in duplicate and legible maps showing the previous and new outfall location must be attached to the form.

Moving an outfall location without satisfying the four above listed conditions will be considered a violation of this permit and subject to full enforcement authority of the WDQ.

An outfall relocation as described above will not be allowed if the new outfall location is less than one mile from the confluence of a Class 2 waterbody and the dissolved iron limits established in the permit for the outfall are based upon Class 3 standards.

C. RESERVOIR / IMPOUNDMENT REQUIREMENTS

1. Groundwater Monitoring Beneath Impoundments:

Table 1 of the permit above identifies which outfalls (if any) are designed to discharge into impoundments that are subject to groundwater monitoring requirements established in the latest version of the Water Quality Division guideline "*Compliance Monitoring for Groundwater Protection Beneath Unlined Coalbed Methane Produced Water Impoundments.*" These specified outfalls are not authorized to discharge until a written groundwater compliance approval has been granted by the Groundwater Pollution Control Program of the Water Quality Division. A groundwater compliance approval will consist of either a final approved groundwater compliance monitoring plan, or written authorization for an exemption thereof. Once an impoundment has been granted a written groundwater compliance approval, the contributing outfall(s) to that reservoir may commence discharge.

2. Reclamation Performance Bonds for On-Channel Reservoirs:

Table 1 of the permit above also identifies which outfalls (if any) are designed to discharge into impoundments that are subject to WDEQ bonding requirements, as set forth in the latest version of the Water Quality Division guideline "*Implementation Guidance for Reclamation and Bonding of On-Channel Reservoirs That Store Coalbed Natural Gas Produced Water.*" These specified outfalls are not authorized to discharge until the associated reservoir reclamation bond is approved by WDEQ. Once the reservoir reclamation bond is approved by WDEQ, the contributing outfall(s) to that reservoir may commence discharge.

Any discharge into an above-listed impoundment which has not been secured by the required WDEQ-approved bond, or which has not been granted the required groundwater compliance approval, will constitute a violation of this permit, and may result in enforcement action from the Water Quality Division.