

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

STATEMENT OF BASIS  
RENEWAL

APPLICANT NAME: Pennaco Energy, Inc.

MAILING ADDRESS: 3601 Southern Drive  
Gillette, WY 82718

FACILITY LOCATION: Felix Field CBM Area, located in the SESE, Section 17, the SWNW, SENE, and the NWSW, Section 19, the NENE, NESE, and SWSE, Section 20, the SENW and SWSW, Section 21, the NESW, Section 27, the NWNW, NWSW, SWNE, SESE, and SENW, Section 28, the SWSW, NWSW, and SWNE, Section 29, the NENW, NENE, SENW, NESE, and NESW, Section 30, the NENE and NESE, Section 31, the SWSW, SWSE, SENE, NWNE, and SWNW, Section 32, the SESW and NWSW, Section 33, the NENE, NESW, SENW and NWNW, Section 34, the NWSE and SWSW, Section 35, Township 51 North, Range 74 West, and in the NESE, Section 24, Township 51 North, Range 75 West, Campbell County. The produced water will be discharged to various named on-channel reservoirs (3B), located on various unnamed, ephemeral tributaries (3B) of Felix Draw (3B) and Wild Horse Creek (3B), and Felix Draw (3B) and Wild Horse Creek (3B) proper. All of these streams are tributary to the Powder River (2ABWW), via Wild Horse Creek (3B). The permit establishes two irrigation compliance points, located in the SESW, Section 18, Township 51 North, Range 74 West, on Felix Draw, and in the NENW, Section 19, Township 51 North, Range 74 West, on Wild Horse Creek. The permit also establishes a total maximum daily flow limit of 1.97 MGD, and requires that the produced water being discharged by this facility originate in one or more of the following formations: the Anderson and/or Canyon coal seams.

NUMBER: WY0039519

This facility is a typical coal bed methane production facility in which groundwater is pumped from a coal bearing formation resulting in the release of methane from the coal bed. The permit authorizes the discharge to the surface of groundwater produced in this way provided the effluent quality is in compliance with effluent limits that are established by this permit. In developing effluent limits, all federal and state regulations and standards have been considered and the most stringent requirements incorporated into the permit. The EPA Effluent Guidelines and Standards for Oil and Gas Extraction Point Source Category (Part 435, Subpart E) predate the development of coal bed methane extraction technology; however the technology is similar enough to conventional gas extraction that, in the professional judgement of the WDEQ, this effluent limit guideline is appropriately applied to coal bed methane gas production. The guideline limits oil and grease effluent concentrations to less than 35 mg/l and requires that discharges of produced water be used for agricultural production and/or wildlife propagation. This permit does not cover activities associated with discharges of drilling fluids, acids, stimulation waters or other fluids derived from the drilling or completion of the wells.

The permittee has chosen option 2 of the coal bed methane permitting options. Under this permitting option, the produced water is immediately discharged to a class 2 or 3 receiving stream which is eventually tributary to a class 2AB perennial water of the state. The permit establishes effluent limits for the end of pipe, which are protective of all the designated uses defined in Chapter 1 of Wyoming Water Quality Rules and Regulations. This may include drinking water, game and non-game fish, fish consumption, aquatic life other than fish, recreation, agriculture, wildlife, industry and scenic value. In addition, the permit establishes two irrigation compliance points. The irrigation compliance points are designated monitoring locations prior to the first downstream points of irrigation diversion/use in Wild Horse Creek from the permitted facility. Effluent limits associated with the irrigation compliance points - SAR = 6 and EC = 2000 micromhos/cm - were determined from a combination of one or more of the following: technical information submitted by the applicant, published scientific literature, credible water quality data that has been through formally adopted quality control/quality assurance review, and best professional judgement. These limits satisfy provisions under Chapter 1, Section 20 (protection of agricultural water supply) of the Wyoming Water Quality Rules and Regulations. Effluent limits at the irrigation compliance points located in Felix Draw and Wild Horse Creek are in effect year round due to the downstream irrigator's limited ability to divert stream flow away from the fields under irrigation.

The Wyoming DEQ has determined through review of the permit application and available scientific information that effluent discharged from this facility will be put to agricultural and/or wildlife use and is unlikely to reach the Powder River. The permittee has submitted certified statements that demonstrate discharged effluent will be put to use for livestock and wildlife watering. Although some of the discharge will be used by wildlife and livestock, a portion of the flow may also be lost due to stream channel infiltration. Information gathered from Western Land Services, Sheridan Wyoming (April 19, 2001) and Hydrologic Consultants, Inc. (2001) indicate a mean channel infiltration loss rate for ephemeral drainages in the Powder River at 0.1 cfs per mile of stream channel. Review of the permit application reveals that there are approximately 45 miles of stream channel that can be utilized for stream channel infiltration and evaporation losses between the outfalls and the Powder River. The maximum total effluent flow rate from this facility is estimated at 3.04 cfs.

Discharges from the reservoirs being utilized as part of the water management plan for this facility are not permitted except during precipitation events that cause the reservoirs to fill and overtop. The permittee has committed that effluent shall not reach the Powder River. However, in the event that such a situation occurs, this permit establishes a monitoring station on the receiving stream prior to the confluence with the Powder River. This station will function to monitor any effluent flows to the Powder River. In the event discharges from this facility reach the Powder River, the permittee is required to notify the WDEQ within 24 hours should the flow at the tributary monitoring station exceed standards for SAR and EC as established by the state of Montana.

Permit effluent limits are based on federal and state regulations and are effective as of the date of issuance. The permit limits total petroleum hydrocarbons to 10 mg/l and the pH must remain within 6.5 and 8.5 standard units. Effluent limits for total dissolved solids (5,000 mg/l), specific conductance (7500 micromhos/cm), and sulfates (3,000 mg/l) are included to protect for stock and wildlife watering. These limits are based upon Wyoming Water Quality Rules and Regulations, Chapter 7 and apply to discharges from all permitted outfalls. In addition, the permit establishes a radium 226 limit of 1 pCi/l, a dissolved manganese limit of 650 µg/l, a total barium limit of 1800 µg/l, a total arsenic limit of 7 µg/l, and a chlorides limit of 46 mg/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. In addition, the permit establishes a dissolved iron limit of 1000 µg/l, which is based upon chronic aquatic life standards for class 3B waters greater than one mile from the confluence of a class 2 water, and reflects the application of standards required under Chapter 1 of the

Wyoming Water Quality Rules and Regulations. Historic data from this facility indicates that discharges from this facility have the potential to exceed water quality standards for total recoverable aluminum. Therefore, the permit establishes a total recoverable aluminum limit of 750 µg/l at the end of pipe. The total recoverable aluminum limit is based on Wyoming Water Quality Rules and Regulations, Chapter 1 limits for aquatic life acute effects, as the chronic limits do not apply to waters having hardness and pH values in the range of ambient waters in the Powder River basin. The mixing analyses and water balances submitted by the permittee were based upon a maximum daily flow of 1.97 million gallons per day (MGD) from this facility, and water quality representative of groundwater originating from the Anderson and Canyon coal seams at this facility. Therefore, the permit establishes a total maximum daily flow limit of 1.97 million gallons per day (MGD), to be calculated as the sum of all discharge from all permitted outfalls, and requires that the produced water being discharged by this facility originate in one or more of the following formations: the Anderson and/or Canyon coal seams.

Water quality information submitted in support of this permit application indicates that this facility has the potential to exceed new established permit effluent limits for dissolved iron (1000 µg/l at the end of pipe), and total recoverable aluminum (750 µg/l). In order to allow the permittee a window of opportunity to comply with the new dissolved iron and total recoverable aluminum effluent limits being established at this facility, the permit establishes a compliance schedule for the dissolved iron and total recoverable aluminum limits.

In order to monitor and regulate coal bed methane discharge for compliance with Chapter 1, Section 20 (protection of agricultural water supply), effluent limits for sodium adsorption ratio (SAR) and specific conductance are included in this permit. The Wyoming DEQ has determined that an SAR of 6 and a specific conductance of 2000 micromhos/cm are intended to be protective of agriculture use in the Wild Horse Creek drainage. The specific conductance limit of 2000 micromhos/cm is based on the threshold value for alfalfa which is considered to be the most salt sensitive plant irrigated in northeastern Wyoming (USDA George E. Brown Jr. Salinity Laboratory, Salt Tolerance Database, Grasses and Forage Crops). There was no data available to characterize EC tolerance of alfalfa specific to the Wild Horse Creek drainage. The SAR limit of 6 was determined to not reduce the rate of infiltration of irrigated soils in the Wild Horse Creek drainage, given the specific conductance threshold referenced above as ascertained from Figure 3 (page 44) of Agricultural Salinity and Drainage, Hanson et al., 1999 revision. An SAR limit of 6 and specific conductance limit of 2000 micromhos/cm will also maintain the baseline C3-S1 irrigation suitability category for the Powder River drainage (see Figure 25, of Diagnosis and Improvement of Saline and Alkali Soils, US Dept. of Agricultural Handbook No. 60, 1954). Monitoring will be required for flow volume, calcium, magnesium, sodium, bicarbonate, sodium adsorption ratio and specific conductance when flow is present at the irrigation compliance point(s) at any time during the year.

The permit requires daily monitoring on Wild Horse Creek to determine whether water discharged from the outfalls reaches an established irrigation compliance point. Daily monitoring is necessary because the permit establishes different sampling and analysis requirements based on whether the effluent reaches an irrigation compliance point. Once flow at an irrigation compliance point has been documented within a sampling month, then weekly monitoring of flow is required for the month. At the beginning of each calendar month, the frequency will revert to daily. Effluent samples must be collected on a weekly basis if flow persists at an irrigation compliance point for 24 hours or more. Results are to be reported twice-yearly and if no flow occurs then "no discharge" is to be reported. Should the permittee be able to substantively document that this facility did not contribute to flows at an ICP at any time during the monitoring period in question, the permittee may report "did not contribute" on the discharge monitoring reports for the monitoring period in question, and is not required to collect samples at the irrigation compliance point for the monitoring period in question. It will be the responsibility of the permittee to demonstrate that the effluent from this facility did not contribute to flow occurring at the irrigation compliance points. The irrigation compliance points will be located in the SESW, Section 18, Township 51 North, Range 74 West, on Felix Draw, and in the NENW, Section 19, Township 51

North, Range 74 West, in the main channel of Wild Horse Creek, prior to the first downstream irrigation diversions on Felix Draw and Wild Horse Creek.

The permit requires sampling at a designated tributary water quality monitoring station located on the receiving stream – Wild Horse Creek, and at mainstem water quality monitoring station locations on the Powder River upstream and downstream of the Wild Horse Creek - Powder River confluence. Water quality monitoring stations on the Powder River will be located in the main channel of the Powder River outside of the mixing zone of Wild Horse Creek and the Powder River. Effluent samples at the designated water quality monitoring stations must be collected on a monthly basis and are to be reported semiannually. 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, UPR, and DPR 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 tributary and the mainstem. Monthly water quality samples are to be collected at all three water quality monitoring stations when effluent from this CBM facility reaches the TRIB1 station on Wild Horse Creek. If flow occurs at the TRIB1 station 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 three 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 the TRIB1 station. If no flow at all occurs at the TRIB1 station for an entire monthly monitoring period, then “no flow” is to be reported and samples need not be collected at the three water quality monitoring stations for that monthly monitoring period.

At the designated water quality monitoring stations, monitoring will be required for calcium, magnesium, sodium, sodium absorption ratio and specific conductance. Information gathered from the water quality monitoring stations may result in modification of the permit to protect existing uses on the tributary and mainstem.

The designated water quality monitoring stations are located on the tributary (Wild Horse Creek) in the SESE, Section 16, Township 54 North, Range 77 West, and on the mainstem (Powder River) in the SWSE, Section 16, Township 54 North, Range 77 West, and in the NWSE, Section 34, Township 55 North, Range 77 West, upstream and downstream (respectively) of the Wild Horse Creek – Powder River confluence, in the main channel of the Powder River. Established water quality monitoring stations on the mainstem are to be located outside the mixing zone of the tributary with the mainstem.

Results are to be reported twice-yearly and if no discharge occurs at the outfall then "no discharge" is to be reported. The permit also requires that an initial monitoring of the effluent be conducted within the first 60 days of discharge and the results submitted to WDEQ and the U.S. Environmental Protection Agency within 120 days of the commencement of discharge.

Reservoir and/or discharge water is to be released at a rate which does not cause significant erosion to the channel or receiving lands.

There shall be no discharge of floating solids or visible foam in other than trace amounts, nor shall the discharge cause formation of visible deposits of iron, hydrocarbons or any other constituent on the bottom or shoreline of the receiving water. In addition, erosion control measures will be implemented to prevent significant damage to or erosion of the receiving water channel at the point of discharge.

The discharge of wastewater and the effluent limits that are established in this permit have been reviewed to ensure that the levels of water quality necessary to protect the designated uses of the receiving waters are maintained and protected. An antidegradation review has been conducted and verifies that the permit

conditions, including the effluent limitations established, provide a level of protection to the receiving water consistent with the antidegradation provisions of Wyoming surface water quality standards.

Self monitoring of effluent quality and quantity is required on a regular basis with reporting of results semiannually. The permit is scheduled to expire on December 31, 2008, which is reflective of the WDEQ's efforts towards watershed permitting and similar expiration dates for all permits within a specific drainage, which will allow for basin-wide analysis upon renewal of the permits in the drainage. This permit renewal represents a consolidation of three WYPDES permits, WY0039519, WY0039535, and WY0039543. Upon issuance of this renewal, WYPDES permits WY0039535 and WY0039543 will be terminated.

Kathy Shreve  
Water Quality Division  
Department of Environmental Quality  
Drafted: September 1, 2004

AUTHORIZATION TO DISCHARGE UNDER THE  
WYOMING 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

Felix Field CBM Area,

which is located in the

SESE, Section 17, the SWNW, SENE, and the NWSW, Section 19, the NENE, NESE, and SWSE, Section 20, the SENW and SWSW, Section 21, the NESW, Section 27, the NWNW, NWSW, SWNE, SESE, and SENW, Section 28, the SWSW, NWSW, and SWNE, Section 29, the NENW, NENE, SENW, NESE, and NESW, Section 30, the NENE and NESE, Section 31, the SWSW, SWSE, SENE, NWNE, and SWNW, Section 32, the SESW and NWSW, Section 33, the NENE, NESW, SENW and NWNW, Section 34, the NWSE and SWSW, Section 35, Township 51 North, Range 74 West, and in the NESE, Section 24, Township 51 North, Range 75 West, Campbell County,

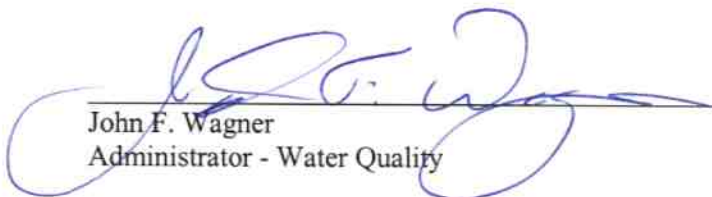
to receiving waters named

various named on-channel reservoirs (3B), located on various unnamed, ephemeral tributaries (3B) of Felix Draw (3B) and Wild Horse Creek (3B), and Felix Draw (3B) and Wild Horse Creek (3B) proper. All of these streams are tributary to the Powder River (2ABWW), via Wild Horse Creek (3B),

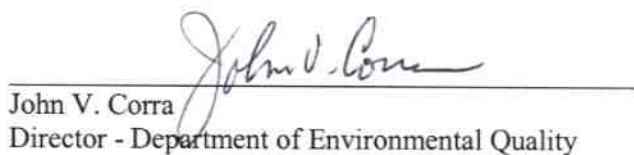
in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II and III hereof.

This 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 December 31, 2008, at midnight .

  
John F. Wagner  
Administrator - Water Quality

Date 4/4/05

  
John V. Corra  
Director - Department of Environmental Quality

Date 4/5/05

PART IA. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Effective immediately and lasting through December 31, 2008, 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 - 038. This permit renewal represents a consolidation of three WYPDES permits, WY0039519, WY0039535, and WY0039543. Upon issuance of this renewal, WYPDES permits WY0039535 and WY0039543 will be terminated.

**1.a. Interim Effluent Limits:** Effective immediately and lasting through June 30, 2005, the quality of effluent discharged by the permittee shall, at a minimum, meet the limitations set forth below. Effluent limits for dissolved iron and total recoverable aluminum are not included in the interim period. However, the permittee is required to report the concentration of these constituents present at each outfall on the discharge monitoring reports for this monitoring period.

Effluent Limits

<u>Effluent Characteristic</u>	<u>Daily Maximum</u> <u>Outfall</u>	<u>Daily Maximum</u> <u>Irrigation Compliance Point***</u>
Chlorides, mg/l	46	
Dissolved Manganese, µg/l	650	
pH, standard units	6.5 – 8.5	
Specific Conductance, micromhos/cm	7500	2000
Sulfates, mg/l	3000	
Sodium Adsorption Ratio, calculated as unadjusted ratio		6
Total Arsenic, µg/l	7	
Total Dissolved Solids, mg/l	5000	
Total Petroleum Hydrocarbons (TPH), mg/l*	10	
Total Flow, MGD**	1.97	
Total Radium 226, pCi/l	1	

\*Acceptable methods for this parameter are 1664 in the latest edition of Standard Methods for the Examination of Water and Wastewater and EPA SW846 Method 8015 (modified) for Total Extractable Petroleum Hydrocarbons.

\*\*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 in the Anderson and/or Canyon coal seam.

\*\*\* Effluent limits associated with the irrigation compliance point are in effect year-round.

The pH shall not be less than 6.5 standard units nor greater than 8.5 standard units in any single grab sample.

**1.b. Final Effluent Limits:** Effective no later than July 1, 2005, and lasting through December 31, 2008, the quality of the effluent discharged by this facility shall, at a minimum, meet the limitations set forth below. Effluent limits of 1000 µg/l for dissolved iron and 750 µg/l for total recoverable aluminum are included in the final effluent limits.

Effluent Limits

<u>Effluent Characteristic</u>	<u>Daily Maximum Outfall</u>	<u>Daily Maximum Irrigation Compliance Point***</u>
Chlorides, mg/l	46	
Dissolved Iron, µg/l	1000	
Dissolved Manganese, µg/l	650	
pH, standard units	6.5 - 8.5	
Specific Conductance, micromhos/cm	7500	2000
Sulfates, mg/l	3000	
Sodium Adsorption Ratio, calculated as unadjusted ratio		6
Total Arsenic, µg/l	7	
Total Barium, µg/l	1800	
Total Dissolved Solids, mg/l	5000	
Total Petroleum Hydrocarbons (TPH), mg/l*	10	
Total Radium 226, pCi/l	1	
Total Flow, MGD**	1.97	
Total Recoverable Aluminum, µg/l	750	

\*Acceptable methods for this parameter are 1664 in the latest edition of Standard Methods for the Examination of Water and Wastewater and EPA SW846 Method 8015 (modified) for Total Extractable Petroleum Hydrocarbons.

\*\*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 in the Canyon coal seam.

\*\*\* Effluent limits associated with the irrigation compliance point are in effect from April 1 through September 30 each calendar year

The pH shall not be less than 6.5 standard units nor greater than 8.5 standard units in any single grab sample.

**c. The following effluent limitations and permit requirements are in force during the entire permit term:**

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. This facility, upon renewal, consists of 38 outfalls and 197 wells.

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.

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

**a. Monitoring of the initial discharge**

*The permittee is only required to collect, analyze and sample to meet initial monitoring requirements from outfalls that have not previously been sampled and had results submitted to meet the initial monitoring requirements as described below.*

Within 60 days of commencement of discharge, a sample shall be collected from each outfall and analyzed for the 24 constituents specified below, at the required detection limits. Within 120 days of commencement of discharge, 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 24 constituents. 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 effluent limits and monitoring requirements established in this permit may be modified.

<b>Parameter*</b> (See notes following the table on chemical states)	<b>Required Detection Limits and Required Units</b>
Alkalinity, Total	1 mg/l as CaCO <sub>3</sub>
Aluminum, Total Recoverable	50 µg/l
Arsenic, Total	1 µg/l
Barium, Total	100 µg/l
Bicarbonate	10 mg/l
Cadmium, Dissolved	5 µg/l
Calcium, Dissolved	50 µg/l, report as me/l
Calcium, Dissolved	50 µg/l, report as mg/l
Chlorides	5 mg/l
Copper, Dissolved	10 µg/l

<b>Parameter*</b> (See notes following the table on chemical states)	<b>Required Detection Limits and Required Units</b>
Dissolved Solids, Total	5 mg/l
Hardness, Total	10 mg/l as CaCO <sub>3</sub>
Iron, Dissolved	50 µg/l
Lead, Dissolved	2 µg/l
Magnesium, Dissolved	100 µg/l, report as me/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	0.2 pCi/l
Selenium, Total Recoverable	5 µg/l
Sodium Adsorption Ratio	Calculated as unadjusted ratio
Sodium, Dissolved	100 µg/l, report as me/l
Sodium, Dissolved	100 µg/l, report as mg/l
Specific Conductance	5 micromhos/cm
Sulfates	10 mg/l
Zinc, Dissolved	50 µg/l

**TOTAL:** Value is expressed in terms of total recoverable metal in the water column.

**NOTE:** Except for aquatic life values for metals and where otherwise indicated, the values given refer to the total recoverable (dissolved plus suspended) amount for each substance. For the aquatic life values for metals, the values refer to the dissolved amount.

**DISSOLVED:** Value is based on the dissolved amount which is the amount that will pass through a 0.45 µm membrane filter prior to acidification to pH 1.5 - 2.0 with nitric acid.

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  
999 18th St., Suite 300  
Denver, CO 80202-2466

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 – 001-038

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 (mg/l)	Once every six months	Grab
Dissolved calcium (mg/l)	Monthly	Grab
Dissolved calcium (me/l)	Monthly	Grab
Chloride (mg/l)	Annually	Grab
Dissolved Iron ( $\mu\text{g/l}$ )	Annually	Grab
Dissolved Manganese ( $\mu\text{g/l}$ )	Annually	Grab
Dissolved Magnesium (mg/l)	Monthly	Grab
Dissolved Magnesium (me/l)	Monthly	Grab
pH (standard units)	Once Every Six Months	Grab
Total Radium 226 (pCi/l)	Annually	Grab
Dissolved Sodium (mg/l)	Monthly	Grab
Dissolved Sodium (me/l)	Monthly	Grab
Sodium Adsorption Ratio (unadjusted)	Monthly	Calculated
Specific Conductance (micromohs/cm)	Monthly	Grab
Sulfate (mg/l)	Annually	Grab
Total Alkalinity (mg/l)	Once Every Six Months	Grab
Total Arsenic ( $\mu\text{g/l}$ )	Annually	Grab
Total Barium ( $\mu\text{g/l}$ )	Annually	Grab
Total Flow – (MGD)	Monthly	Continuous
Total Petroleum Hydrocarbons* (mg/l)	Annually	Grab
Total Recoverable Aluminum ( $\mu\text{g/l}$ )	Annually	Grab

\*Acceptable methods for this parameter are 1664 in the latest edition of Standard Methods for the Examination of Water and Wastewater and EPA SW846 Method 8015 (modified) for Total Extractable Petroleum Hydrocarbons.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At the outfall of the final treatment unit which is located out of the natural drainage and prior to admixture with diluent waters.

c. Irrigation Compliance Points – ICP1 and ICP2

For the duration of the permit, at a minimum, samples for the constituents described below shall be collected at the indicated frequencies when water discharged from any permitted outfall reaches any irrigation compliance point. Irrigation compliance point limits and requirements are in effect year-round due to the downstream irrigator's limited ability to divert flow in the stream channel away from the fields undergoing irrigation.

Parameter	Measurement Frequency	Sample Type
Dissolved Calcium (mg/l)	Monthly	Grab
Dissolved Calcium (me/l)	Monthly	Grab
Dissolved Magnesium (mg/l)	Monthly	Grab
Dissolved Magnesium (me/l)	Monthly	Grab
Dissolved Sodium (mg/l)	Monthly	Grab
Dissolved Sodium (me/l)	Monthly	Grab
Sodium Adsorption Ratio (calculated as unadjusted ratio)	Monthly	Calculated
Specific Conductance (micromohs/cm)	Monthly	Grab
Flow (MGD)	Monthly	Instantaneous

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: at the irrigation compliance points which are located as follows: in the SESW, Section 18, Township 51 North, Range 74 West, on Felix Draw, and in the NENW, Section 19, Township 51 North, Range 74 West, in the main channel of Wild Horse Creek.

The permit requires daily monitoring of the irrigation compliance points described above to determine whether water discharged from the outfalls reaches an established irrigation compliance point. Daily monitoring is necessary because the permit establishes different sampling and analysis requirements based on whether the effluent reaches an irrigation compliance point. Once flow at an irrigation compliance point has been documented within a sampling month, then weekly monitoring of flow is required for the month. At the beginning of each calendar month, the frequency will revert to daily. Should the permittee be able to substantively document that this facility did not contribute to flows at an ICP at any time during the monitoring period in question, the permittee may report "did not contribute" on the discharge monitoring reports for the monitoring period in question, and is not required to collect samples at the irrigation compliance point for the monitoring period in question. It will be the responsibility of the permittee to demonstrate that the effluent from this facility did not contribute to flow

occurring at the irrigation compliance points. Effluent samples must be collected on a weekly basis if flow persists at the irrigation compliance point for 24 hours or more. Results are to be reported twice-yearly and if no discharge occurs then "no discharge" is to be reported.

d. Water Quality Monitoring Stations TRIB1, UPR, DPR

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 (mg/l)	Monthly	Grab
Dissolved Calcium (me/l)	Monthly	Grab
Dissolved Magnesium (mg/l)	Monthly	Grab
Dissolved Magnesium (me/l)	Monthly	Grab
Dissolved Sodium (mg/l)	Monthly	Grab
Dissolved Sodium (me/l)	Monthly	Grab
Sodium Adsorption Ratio (calculated as unadjusted ratio)	Monthly	Calculated
Specific Conductance (micromohs/cm)	Monthly	Grab
Flow* (MGD)	Monthly	Instantaneous

\*The permittee is only required to monitor and report flow at the tributary monitoring station on Wild Horse Creek (TRIB1). The permittee is not required to monitor or report flow data at the mainstem water quality monitoring stations (UPR and DPR), see Table 1 at the end of Part I for location descriptions.

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, UPR, and DPR in Table 1 (located at the end of Part I). Established water quality monitoring stations on the mainstem are to be located outside the mixing zone with the tributary and the mainstem. Monthly water quality samples are to be collected at all three water quality monitoring stations when effluent from this CBM facility reaches the TRIB1 station on Wild Horse Creek. If flow occurs at the TRIB1 station 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 three 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 the TRIB1 station. If no flow at all occurs at the TRIB1 station for an entire monthly monitoring period, then "no flow" is to be reported and samples need not be collected at the three water quality monitoring stations for that monthly monitoring period. At the designated water

quality monitoring stations, monitoring will be required for calcium, magnesium, sodium, sodium absorption ratio and specific conductance. Information gathered from the water quality monitoring stations may result in modification of the permit to protect existing uses on the tributary and mainstem.

e. Compliance Schedule:

1. The permittee will submit to the permit issuing authority on or before May 15, 2005, an action plan to comply with the dissolved iron and total recoverable aluminum final effluent limits established in this permit. The action plan must contain :
  - A. A general written design for the treatment system, construction start date, construction completion date, and sampling and analysis plans to ensure the efficiency of the chosen action plan.
  - B. The plan must include a description of the steps that will be taken to demonstrate action plan efficiency.
2. By June 30, 2005, the action plan must be completed and implemented. A summary of findings for compliance with the action plan must be submitted no later than September 30, 2005. The summary must include a demonstration of compliance with the final effluent limits for dissolved iron (1000 µg/l) and total recoverable aluminum (750 µg/l).

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, irrigation compliance point, 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 is due on August 15, 2005.

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.

