WY0054585

EXPLORATION & PRODUCTION
300 N. Works Avenue
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February 28, 2006

Jason Thomas
Wyoming Department of Environmental Quality
Water Quality Division – WYPDES
122 West 25th Street
Herschler Building 4W
Cheyenne, WY 82002

RE: WYPDES New Permit Application: CDU Spellman II – Option 2

Williams Production RMT Company (Williams) respectfully submits the attached new WYPDES application for their CDU Spellman II coal bed methane project in Township 53 North, Range 75 West in Campbell County, Wyoming. Williams seeks authorization to discharge under an Option 2 permit, as the produced water will be discharged to 13 on-channel ponds which are Class 3 waters of the state. A central water line will be constructed to allow produced water from all wells within the Cedar Draw Unit to be collected, commingled and discharged at any of the outfalls listed in this permit or at other Williams permits within this area (e.g. WY0050865, WY0051691, WY0053481 and WY0054151). This concept will allow Williams to maximize the beneficial use of the produced water by landowners and their livestock, while also directing flow to stock ponds or off-channel units where infiltrative and evaporative losses can be maximized.

This application package includes the following items:

- WYPDES Permit Application
- Representative water quality analyses from the four target coals
- Table(s) indicating Outfall, Well and Landowner Information
- Water Balance and Mixing Analyses
- Section 20 Compliance Analysis
- Map of the facility

Based on the water quality analysis submitted with this application, Williams will comply with the permit effluent limits for discharges to class 3 waters with the application of a Tier I anti-degradation analyses. All of the outfalls listed in this application are located between 14.7 and 18.8 linear miles from the Powder River, therefore Williams requests the Tier I anti-degradation

limit are established for dissolved copper. The results of blending the water quality from the four coal seams indicate compliance with the effluent limitations specified in W.W.Q.R.R. Chapter 2, Appendix H and the water quality criteria for the protection of livestock and wildlife as specified in W.W.Q.R.R. Chapter 1, Wyoming Surface Water Quality Standards.

Williams is submitting a Section 20 Compliance Analysis for the irrigated lands located along Middle Prong Wild Horse Creek on Mr. Bobbie Spellman's property. This analysis supports the establishment of end-of-pipe effluent limits for specific conductance and Sodium Adsorption Ratio of 4,000 micromhos/cm and 25, respectively. Accordingly, Irrigation Monitoring Points have been located downstream of the discharge points and upstream of the irrigated meadows on Middle Prong Wild Horse Creek.

The water balance includes produced water as an input and reservoir evaporation and infiltration along with in-channel stream infiltration as outputs. Based on these variables, approximately 1.34 mgd of water could be discharged and contained within the reservoirs and stream channels prior to Mr. Spellman's irrigated lands. Williams has the only authorized discharge points on South Windmill Draw and to their knowledge Black Bill Draw. Therefore, the use of the ephemeral stream channels for loss of produced water was included within the water balance.

If you have any questions or require additional information, please contact Peggy Carter at (307) 685-5225 or Brian Heath at (307) 635-0835. Thank you for your expeditious review of this application.

Sincerely,

Brian Heath

Brian Heath
ARCADIS G & M, Inc.

Enclosure

SUBMIT IN TRIPLICATE

For Agency Use Only

Application Number

WY00 54585

Date Received:

(mo/day/yr)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
APPLICATION FOR PERMIT TO SURFACE DISCHARGE PRODUCED WATER FROM COAL BED METHANE NEW DISCHARGES, RENEWALS, OR MAJOR MODIFICATIONS

Revised 12-19-03

PLEASE PRINT OR TYPE

1. Check the box corresponding to the type of application being applied for

   ☒ New CBM permit

   ☐ CBM permit renewal Permit number _____

   ☐ CBM permit major modification Permit number _____

2. Select a permit option

   ☐ Option 1A - complete containment to an off-channel man made containment unit(s) (class 4C), no discharge allowed to surface waters of the state outside the containment unit.

   ☐ Option 1B - complete containment to a natural closed basin or playa lake (class 3A), no discharge allowed to surface waters of the state outside the basin or playa.

   ☐ Option 2 - surface discharge to class 2 or 3 receiving stream of the Belle Fourche River or Cheyenne River drainage (class 2ABWW).

   ☒ Option 2 - surface discharge to class 2 or 3 receiving stream of the Powder River or Little Powder Rivers (class 2ABWW).

   ☐ Option 2 – surface discharge to class 2 or 3 receiving streams of the Tongue, Clear Creek, or Crazy Woman Creek (class 2AB)– this option requires the permittee to demonstrate that quality of the effluent at the discharge point is equal to or better than the ambient quality of the perennial class 2 receiving water.

3. Name, mailing address, e-mail address, location and telephone number of the individual or company which owns the facility producing the discharge.

Name: **Williams Production RMT Company**

Street Address: **300 North Works Avenue**

City, State, and Zip Code: **Gillette, WY 82716**

Telephone Number: **307-686-1636**

E-Mail Address: **Peggy.Carter@Williams.com**

4. Name(s) and mailing address(es) of owner(s) of the surface rights on whose land the discharge occurs (in cases where the land is owned by the state or federal government but surface rights are leased to a private individual, provide lessee's name and address)
Name:

See Table 3.

Street Address:

City, State, and Zip Code:

Telephone Number:

5. Name of the facility producing the discharge (this is the facility name that will appear on the NPDES permit. It is not necessary to name every well contributing to this facility's discharge in this section)

CDU Spellman II – Option 2

6. For Option 1A or 1B permit, attach a water balance that demonstrates, considering total maximum projected discharge inflows, natural precipitation, evaporation and infiltration, that the containment unit will be adequately sized to contain all projected discharge and stormwater runoff from a 100 year, 24 hour storm event. If actual flow rates are available, use the maximum flow rate from all active wells within the previous six months of operation in the water balance.

7. For an Option 2 permit utilizing on-channel reservoirs, attach a water balance and mixing analysis documenting the amount of CBM discharge that, under normal operating conditions, can be contained within the reservoirs, the amount and circumstances under which the reservoirs will discharge, and the expected water quality upon discharge from the reservoirs.
See attached Table 4 documenting the annual water balance for the on-channel ponds proposed for containment for this facility. See Appendix B: Mixing Analysis for Water Quality Reaching Bobbie Spellman's Irrigated Land (5/19/2005) for various ratios of produced water versus storm water that can be expected to reach the irrigated lands downstream of the proposed discharges. Note that produced water sample used in the mixing analysis is not the same water quality samples used within Table 5. Table 5 contains more recent water samples for each coal seam, including the better quality Smith coal. While the specific conductance, sodium, calcium and magnesium concentrations are not identical, each sample provides an example of expected water quality when produced water mixes with stormwater and runs down the drainages toward the irrigated lands on Mr. Spellman's property. Furthermore, regardless of the representative water quality samples used to demonstrate expected water quality at the IMPs, all values are well below the specific conductance level of 4,000 micromhos/cm and SAR of 25 that were determined to be acceptable for irrigation on Mr. Spellman's irrigated lands.

8. Attach a description and a clear, legible, detailed topographic map of the discharging facility. Include the following:
   a. A legend
   b. Well locations
   c. Ponds
   d. Reservoirs
   e. Stock tanks
   f. Discharge points (outfalls)
   g. Immediate receiving streams
   h. Water quality monitoring stations
   i. Irrigation compliance points
   j. Location of nearest downstream irrigator.

k. Section, Township, and Range information

If any of the above are not applicable please indicate in the description and include a brief explanation as to why the item is not applicable)

9. Describe the control measures that will be implemented to prevent significant damage to or erosion of the receiving water channel at the point of discharge.
All proposed discharge points will be located above on-channel stock ponds and produced water will be discharged through a vertical pipe surrounded by crushed rock, underlain with a liner to prevent erosion to the receiving channels.

10. Describe the control measures that will be implemented to achieve water quality standards and effluent limits. If proposing to utilize a treatment process, provide a detailed description of the treatment process, including, but not limited to: Water quality analyses demonstrating the effluent quality before and after treatment; waste stream volumes and planned method of disposal; aquatic life toxicity data for any chemicals being used in the treatment process; description of how the chemicals will be handled at the facility and the potential for any impacts to waters of the state in the event of a spill; and diagrams of the facility indicating the water treatment path. Additional sheets and diagrams may be attached.
See attached water analyses and blending analyses (Table 5) that demonstrate compliance with end-of-pipe effluent limits established for discharges to Class 3 waters. Given the distance to Class 2 waters, implementation of Tier I anti-degradation for dissolved copper is requested for this permit. Blending of the produced water from the four coal seams demonstrates compliance with dissolved copper within Class 3 waters.

11. Outfall locations must be established as part of a preliminary field reconnaissance survey using GPS or conventional survey equipment and documented in Table 1. Please document the type of equipment used, the expected accuracy of your measurements, and a brief rationale for locating the outfalls at the requested sites below.
GPS receiver, using NAD83 were used to determine pond locations and outfalls coordinates. Accuracy of GPS receivers is typically <20 meters.

12. Complete the attached **Table 1**. Provide all the information in the table for each proposed discharge point or monitoring point. If proposing changes (a major modification) to an existing facility, **clearly** indicate the desired changes on the table. Additional tables may be attached. Use the format provided.
See attached Table 1.

13. Complete the attached **Table 2**. Provide all the information in the table for each well associated with this proposed discharge authorization. If proposing changes (a major modification) to an existing facility, **clearly** indicate the desired changes on the table. Additional tables may be attached. Use the format provided.
See attached Table 2.

14. Provide the results of water analyses for a sample collected from a location representative of the quality of the water being proposed for discharge for the 25 chemical parameters listed below. The sample must be collected from well(s) or outfall(s) within a twenty mile radius of the proposed facility's location, and from the same coal formation(s) and the same approximate depth(s) as proposed in this application. If filing an application for a permit renewal or modification, the representative sample must be collected from the facility being proposed for renewal or modification. Explain why this sample is representative of the produced water to be discharged. **See attached water analyses collected from wells completed to the Anderson and Werner coals within Section 16, T53N-R75W, Gates coal within Section 23, T53N-R76W and Smith coal within Section 25, T54N-R76W. All samples are within 20 miles of the water being proposed for discharge and from the same coal seams that will be dewatered for the CDU Spellman II – Option 2 facility.**

Samples from co-mingled coal seams are acceptable as long as the sample(s) meet the following criteria:

A. all of the coal seams being proposed for development are represented in the co-mingled sample,

B. the ratio of each coal seam's contribution is approximately the same in the sample and the proposed development,

C. documentation is provided to verify the criteria listed in A. and B.

The analyses must be conducted in accordance with approved EPA test procedures (40 CFR Part 136). Include a signed copy of your lab report that includes the following:

a. detection limits
b. results of each of the 25 chemical parameters at the chemical state given below
c. quarter/quarter, section, township and range of the sample collection location
d. Time and date of sample collection
e. Time and date of analysis for each parameter
f. Analyst's initials for each parameter
g. Detection limit for each parameter as achieved by the laboratory
h. NPDES permit number and outfall number, where the sample was collected.
i. Origin of produced water (coal seam)

If more than one coal seam is being proposed for development, the permittee must submit a lab analysis and complete information characterizing water quality from each coal seam being proposed for development. If the permittee is proposing to include discharges from a coal seam not previously developed at this facility, the permittee must submit a lab analysis and complete information characterizing water quality from the new coal seam being proposed for development. Analyses must be provided in the units listed below.

Parameter* (See notes following the table on chemical states)	**Required Detection Limits and Required Units**
Alkalinity, Total	**1 mg/l as $CaCO_3$**
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, Total	**50 µg/l, report as meq/l**
Calcium, Total	**50 µg/l, report as mg/l**
Chlorides	5 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, Total	**100 µg/l, report as meq/l**
Magnesium, Total	**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**

Parameter* (See notes following the table on chemical states)	Required Detection Limits and Required Units
Alkalinity, Total	1 mg/l as $CaCO_3$
Sodium Adsorption Ratio	Calculated as unadjusted ratio
Sodium, Total	100 µg/l, report as meq/l
Sodium, Total	100 µg/l, report as mg/l
Specific Conductance	5 micromhos/cm
Sulfates	10 mg/l
Zinc, Dissolved	50 µg/l

**Discharges into drainages other than the Powder River geologic basin may require analysis of additional parameters, please contact the WDEQ for a separate list.*

15. For new facilities, provide the expected (estimated) flow volume from each well in gallons per day, and provide the rationale behind the flow volume estimate. For existing facilities, provide actual flow data from all wells within the last six months.
Williams Production RMT Company estimates the flow from each well to be as follows: Smith coal wells – 5gpm or 7,200gpd; Anderson coal wells – 5gpm or 7,200gpd; Werner coal wells – 8gpm or 11,520gpd; Gates coal wells – 12gpm or 17,280gpd. At each location the estimated flow rate for all four coals would be 30gpm or 43,200gpd. A flow rate of 932.4 gpm or 1.34 mgd is requested for the permit, which was derived from the annual water balance calculated for the 13 ponds and ephemeral stream channels proposed for containment and infiltration of the produced water.

16. For applications for new facilities, are any of the required chemical constituents in the laboratory analysis present in concentrations above Wyoming Water Quality Standards?

☒ YES ☐ NO

If the answer to question # 16 is yes, answer 16.a. – 16.b below. If no, proceed to question 18.

a. Which constituents? **Dissolved Copper within the Gates produced water sample exceeds the aquatic life chronic value.**
b. Has this constituent been addressed in the response to question 10? **Yes. Discharge will be to Option 2 on-channel containment units, which are within Class 3 waters and located between 14.7 and 18.8 linear miles from the Powder River. Application of Tier I anti-degradation for this facility would allow compliance with dissolved copper limit 8.6ppb as calculated in Table 5.**

17. For applications for existing facilities, has the facility ever exceeded permit limits or water quality standards?

☐ YES ☐ NO

If the answer to question 17 is yes, answer 17.a. – 17.b. If no, proceed to question 18.

a. Which constituents?
b. Has the exceedance been addressed?
c. Describe how the exceedance is being addressed.

18. Is there active irrigation, (including but not limited to irrigation of cultivars or flood irrigation) in the drainage of the discharge?

☒ YES ☐ NO

If the answer to question #18 is yes, then documentation demonstrating one of the following must be provided: **See attached Section 20 Compliance Analysis for Discharges by the Williams Cedar Draw Project to the Middle Prong Wild Horse Creek Drainage, Campbell County, Wyoming (2/27/06). This document supports the establishment of Specific Conductance and SAR limits of 4,000 micromhos/cm and 25 at the end-of-pipe to protect downstream irrigation uses.**

A. Effluent will meet SAR and specific conductance (EC) values that are equal or of better quality to ambient values in the mainstem or highest quality receiving stream; or
B. Demonstrate that a higher level of EC and SAR at the point of irrigation diversion can be tolerated by irrigated soils and crops without a significant reduction in crop yield and soil quality/permeability.

This information should include, but is not limited to the following:

a. Location and description of irrigated crop land between the discharge points and mainstem, including maximum local tolerance thresholds to SAR, EC, and sodium of each crop.
b. Description of irrigation practices including when and how frequent irrigation occurs.
c. Soil characteristics for each area where irrigation occurs which includes:Classification of soils and soil type (i.e. sandy loam, clay, etc.) Composition of soils (% clay, silt, sand), type of soils, texture and permeability
d. Baseline soil parameters in all actively irrigated areas which includes soil SAR, EC, Na, Mg, Ca, permeability, and exchangeable sodium percentage (ESP).
e. Determine the maximum SAR and EC of water that can be applied to the least tolerant and most sensitive identified irrigated soil type and crop, which would not result in a short and/or long-term reduction in soil infiltration/permeability or yield.
f. Provide the location (township, range, section, quarter quarter and lat/long coordinates) of point(s) upstream from the first downstream point of irrigation diversion/use between the outfalls and mainstem and/or provide the location(s) of the irrigation diversion/use that requires the least flow to operate.
g. An evaluation that demonstrates the proposed discharge will be in compliance with Section 20, Chapter 1 of the Wyoming Water Quality Rules and Regulations.
h. If necessary to protect irrigated crops and/or soils, describe changes that must be made in traditional irrigation practices to protect downstream irrigation activities.
i. A monitoring plan, if necessary to gauge changes in water/soil quality and make adjustments before substantial reduction in crop production and soil permeability would occur.
j. Citations of reference for all the above information must be provided.

19. Name(s) and address(es) of all downstream irrigators between the outfalls and the mainstem must be provided.

Name: Bobbie & Becky Spellman
Street Address: PO Box 50
City, State, and Zip Code: Arvada WY 82831
Telephone Number: 307.736.2475

20. Section 40 CFR Part 435 Subpart E requires that the permittee document agricultural and wildlife uses of produced water. Provide documentation that the produced water will be used for agriculture or wildlife

during periods of discharge. Agriculture and wildlife use includes irrigation, livestock watering, wildlife watering and other agricultural uses. Agricultural and wildlife use documentation includes (but is not limited to) a certified letter from a landowner(s), a formal written statement from a state, federal or local resource management agency, or a formal written statement with supporting documentation from a natural resources or environmental professional accompanied by the credentials of the natural resources or environmental professional. Agriculture and wildlife use documentation must be provided for each outfall included in the application. Agricultural and wildlife certification must be submitted for each outfall's discharge, and must have original signatures.

I (CEO or other authorized person) certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief, such information is true, complete, and accurate. I am requesting 13 outfalls in this application.

Thomas E. Doll, P.E.	**District Manager**
Printed Name of Person signing*	Title*
Signature	Date: 2-28-06

*All permit applications must be signed in accordance with 40 CFR Part 122.22, "for" or "by" signatures are not acceptable.

Section 35-11-901 of Wyoming Statutes provides that:
Any person who knowingly makes any false statement, representation, or certification in any application ... shall upon conviction be fined not more than $10,000 or imprisoned for not more than one year, or both.

Mail this application to:

NPDES Permits Section
Department of Environmental Quality/WQD
122 West 25th Street, Herschler Building, 4W
Cheyenne, WY 82002

Please include unique footer information on each page of this application and on all supporting documentation using the following format:
Company Name: Year/Month/Day/NEW, MOD, RENEWAL/10 Digit HUC Code/Permit # (if a modification or renewal) or Application # (from this particular company) for that particular day