

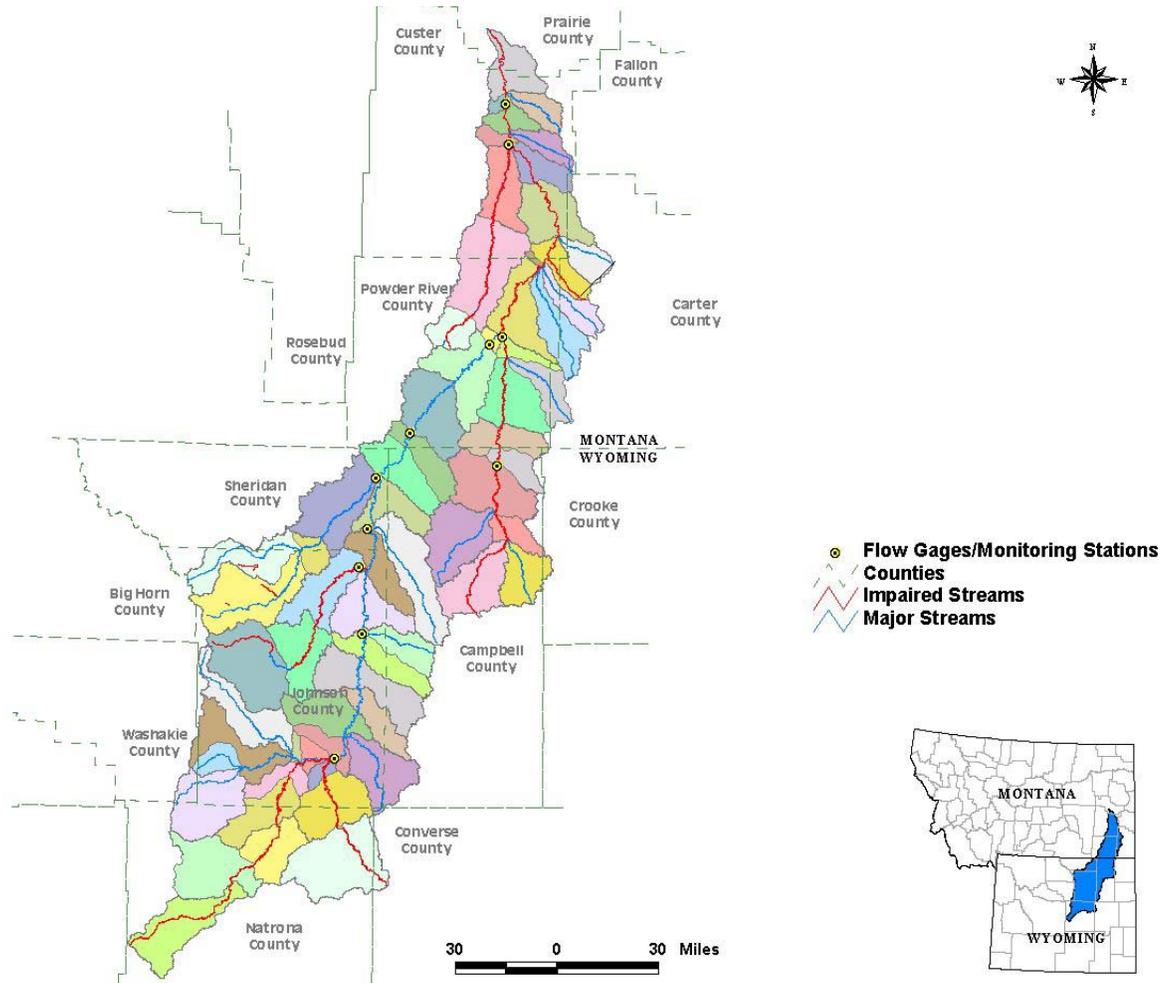
WQD/WYPDES PROGRAM POLICY

WYOMING

POWDER RIVER

ASSIMILATIVE CAPACITY ALLOCATION AND CONTROL PROCESS

The Wyoming Environmental Quality Act (EQA) gives authority to the Wyoming Department of Environmental Quality (DEQ) to prevent, reduce and eliminate pollution; to preserve, and enhance the air, water and reclaim the land of Wyoming; and to plan the development, use, reclamation, preservation and enhancement of the air, land and water resources of the state. The DEQ Water Quality Division (WQD) has adopted this policy consistent with the provisions of Wyoming Water Quality Rules and Regulations Chapters 1 and 2, the EQA and the federal Clean Water Act. DEQ may revise this policy as new information or scientific knowledge becomes available.



STATEMENT OF POLICY

The objective of this Policy is to establish a mechanism, within the existing Wyoming Pollutant Discharge Elimination System (WYPDES) regulatory framework, to allow discharges of coal bed natural gas (CBNG) produced water to the Powder River mainstem while providing the greatest level of assurance that the Wyoming and Montana standards for TDS and Sodium (Na) are protected.

The proper allocation of the Powder River's assimilative capacity plays an important role in the development of the CBNG resources of the state. The WQD has determined that developing an equitable process for managing finite assimilative capacity is the most appropriate method of preserving and protecting the Powder River while providing for the development of the natural gas resources of the State.

In developing this policy for CBNG discharges into the Powder River watershed, the WYPDES Program has considered and evaluated constituents that could potentially be discharged by CBNG wells. These constituents were compared to Wyoming and Montana Water Quality Standards. In many cases, there are constituents that are contained in the produced water with concentrations well below the water quality standard and are therefore not considered to be "constituents of concern" since there is no reasonable potential for an exceedance of the water quality standard. However, there are some constituents that have the potential to result in an exceedance of a water quality standard. For these "constituents of concern" an effluent limit is incorporated in the WYPDES permit.

All of the "constituents of concern" were evaluated in consideration of available assimilative capacity. It was determined that TDS and Sodium were the only constituents with sufficient potential to cause an exceedance of Montana water quality standards at the state line as measured at the Moorhead, Montana USGS (06324500) gauging station. Therefore, the DEQ has determined that TDS and Na require a greater level of permitting oversight. Although the State of Wyoming does not have numeric water quality standards for TDS and sodium, the state uses these parameters as surrogates to ensure compliance with the narrative standard contained in Wyoming Water Quality Rules and Regulations Chapter 1, Section 20.

The State of Montana has numeric standards for electrical conductivity (Ec) and SAR as follows.

■	March 2 Through October 31	
	– Ec Monthly Mean	2000 µmhos/cm
	– Ec Instantaneous Max	2500 µmhos/cm
	– SAR Monthly Mean	5
	– SAR Instantaneous Max	7.5
☐	November 1 Through March 1	
	– Ec Monthly Mean	2500 µmhos/cm
	– Ec Instantaneous Max	2500 µmhos/cm
	– SAR Monthly Mean	6.5
	– SAR Instantaneous Max	9.75

The Annual Ambient Concentration for Ec and SAR in the Powder River as measured at Moorhead, Montana from 1990-2003 are as follows.

■ Annual Ambient Range

- Ec Monthly Maximum (2210 -5170 μ mhos/cm)
- Ec Monthly Mean (1696 – 2880 μ mhos/cm)
- SAR Monthly Maximum (4.5 – 9.5)
- SAR Monthly Mean (3.5 – 5.3)

Discharges of water produced from CBNG operations will be permitted in accordance with this policy and will be limited to less than the available assimilative capacity through the use of conservative modeling assumptions and a margin of safety. Enhanced monitoring of the Powder River mainstem by CBNG Operators will ensure the assimilative capacity (minus the margin of safety) is not exceeded.

The TDS and sodium assimilative capacity will be allocated to those operators developing CBNG resources within the Powder River drainage as set forth in this document. Discharge into the Powder River or its tributaries by CBNG production operations or other new dischargers will be consistent with this policy.

POLICY IMPLEMENTATION

Implementation of the assimilative capacity control system on the Powder River mainstem involves five principal parts:

- I. Determining the assimilative capacity of the Powder River mainstem;
- II. Establishing “credits” to ensure that the capacity is not exceeded;
- III. Regulating credits through a standardized tracking mechanism (e.g. general permit);
- IV. Establishing a Credit Registration Procedure (Registrar)
- V. Establishing a Credit Tracking Mechanism “Credit Bank”.

The principal parts of this policy are summarized as follows:

The WQD will assess assimilative capacity for the Powder River using predictive models developed from ambient water quality data collected at the USGS gauging station near Moorhead, MT. The available load will be calculated in pounds per day for each month and will be reduced by 5% to provide a reasonable margin of safety (MOS).

The modeled assimilative capacity will be divided into “credits” representing 10 pounds of total dissolved solids or sodium. The credits will be calculated from the CBNG Entity’s share of mineral lease acreage times the calculated coal volume under the lease acreage.

The WQD will regulate assimilative capacity “credits” through a standardized tracking mechanism for the Powder River mainstem. The standardized tracking mechanism will be made publicly available by the WQD.

The DEQ will enter into a memorandum of agreement with the Wyoming Geological Survey (WYGS) for to act as the Registrar and implement the Registration Procedures of this policy. The WQD will implement a standardized tracking mechanism that will serve as the means for allocating the calculated available mass loading of total dissolved solids and sodium (a constituent of the sodium adsorption ratio or SAR) from discharges of CBNG production operations in the entire Powder River mainstem watershed. General, individual and/or watershed permits will continue to be issued, after public notice and comment, to authorize discharges when required under Chapter 2 and will specify how credits are used.

Permitted credits will be debited from the appropriate CBNG Entity’s Credit Bank account, which will be managed by the DEQ. Individual and/or watershed permits will continue to impose limits required by Chapter 1 and Chapter 2 and as necessary to protect local and watershed conditions in addition to total dissolved solids and sodium for the Powder River mainstem.

The principal parts of this policy are described in greater detail in the remainder of this document.

I. Determination of Powder River Assimilative Capacity

- A. The WQD will utilize predictive models to calculate the available mass loading of total dissolved solids and sodium on the Powder River. Background concentrations used in the predictive models will be calculated using data collected at the Moorhead Montana USGS gauging station.
- B. At a minimum, the determination of the available load capacity will be calculated, in pounds per day, for each month and will be based upon an evaluation of results derived from the following two models:
 - 1. “Spreadsheet Model” - The spreadsheet model is an excel spreadsheet model developed by the United States Environmental Protection Agency (EPA) and recalibrated by the WQD.
 - 2. “BSNMODY” – The BSNMODY model is a regression model fitted to the Powder River.

When deciding which model results to use, the WQD will give greater weight to the model demonstrating the greatest confidence level in predicting assimilative capacity taking into consideration the stream flow data for each month.

Other appropriate predictive models will be evaluated as they become available.

- C. The modeled assimilative capacity for each month will be reduced by five (5) percent to provide a reasonable margin of safety.
- D. After notice and public comment, the WQD may update assimilative capacities based upon new or refined models, monitoring data and/or new science.
- E. Any recalculated assimilative capacity will be allocated or removed based on the allocation procedures contained in this policy.

II. Establishing Credits

A. Total Available Credits

The modeled assimilative capacity in pounds per day, after reduction of the margin of safety, will represent the total available credits for each month and will be divided into “standard credits.”

1. Each credit will represent 10 pounds of total dissolved solids or sodium.
2. Each credit is valid only for the month in which it is calculated and issued.
3. All fractional values are reduced to the next lowest integer.
4. Any fractional values not issued will be added to the margin of safety.

For example, if 10,000 credits are to be issued, and CBNG entity “A” has 13.373 percent of the coal volume in the Powder River mainstem, CBNG entity “A” will be issued 1337 credits. The remaining 0.3 credits will be added to the margin of safety.

B. Calculated Standard Credits

- a) Standard Credits will be calculated based on each CBNG Entity’s operator of record acreage plus percent of mineral lease hold acreage where there is no operator of record times the calculated coal volume.
- b) The coal volume and acreage information for each section of the Powder River Watershed is available through Wyoming Geological Survey and Wyoming Oil and Gas Conservation Commission Records.
- c) Each CBNG Entity’s shares will be subject to the free market system and may be sold, purchased or traded with prior notification to the DEQ.
- d) Credits may only be transferred from one party to another if they are shown as a credit in the “Credit Bank” maintained by DEQ.
- e) Transferred Credits may not be used until the transaction has been recorded by the DEQ, a standardized tracking mechanism authorization for the credits has been issued to the new owner of the credits and the credits have been incorporated into a general, individual or watershed based permit for surface discharge issued by the DEQ.

C. Unleased Credits

Any credits associated with unleased acreage will be used as follows:

- a) To offset existing discharges not currently covered by this policy.
- b) As additional margin of safety until such time as the acreage becomes leased.

D. Treatment Credits

Inclusion of treatment credits was considered but was not incorporated into this policy because implementation was determined to be unmanageable and unenforceable. However, the WQD may consider treatment credits in the future if an implementation plan that is both manageable and enforceable is developed.

III. Regulating Credits

A. Standardized Tracking Mechanism for TDS and Sodium Assimilative Capacity Credits

1. The WQD will establish a standardized tracking mechanism for TDS and Sodium assimilative capacity credits on the Powder River Mainstem (PRM).
2. Any CBNG entity with produced water discharge that will or may discharge in a fashion that could reach the mainstem Powder River must obtain credits through the PRM standardized tracking mechanism in addition to obtaining the appropriate general, individual or watershed-based permit for surface discharge from the DEQ.
3. A CBNG entity seeking to establish credits under the PRM standardized tracking mechanism will be required to submit an application for credits and certification of available credits.
4. The standardized tracking mechanism will require the submission of information necessary for adequate program implementation. At a minimum the application will require the following:
 - a. Information identified in WWQRR Chapter 2, Section 4 (n) (i); and
 - b. A certification of Credits from the DEQ;
5. Issuance of credits under the PRM standardized tracking mechanism does not in and of itself give authorization for discharge. Issuance of credits under the PRM standardized tracking mechanism merely provides certification to the WQD that an applicant is permitted to discharge the specified number of credits into the Powder River mainstem. Authorization for the actual discharge and appropriation for use of the credits will be issued under a separate permitting mechanism.
6. As part of the standardized tracking mechanism, credit holders will be required to submit a monthly electronic activity report, including at a minimum:
 - a. CBNG entity name, address and contact information;
 - b. Number of credits held by the CBNG entity for the month;
 - c. A listing, by permit number, of each location from which a CBNG produced water discharge occurred, providing:
 - A. Quantity of discharge in million gallons per day (MGD) to the nearest hundredth;
 - B. Concentration of TDS and Na in each discharge;
 - C. Total credits consumed;
7. Through the standardized tracking mechanism, credit holders will be required to submit an update to the WQD of any change in ownership or operating acreage of any section in the Powder River mainstem basin prior to any transfer.
8. All credits issued under the standardized tracking mechanism and the accompanying application will be posted on the WQD website for public viewing.

B. Use of Credits

1. Credits issued under the PRM standardized tracking mechanism will be deducted from the CBNG Entity's Credit Bank account when credits are applied to an individual, general or watershed based effluent discharge permit.
2. Credits will be charged for calculated loads associated with permitted end-of-pipe direct or indirect discharges to:
 - a. the mainstem,
 - b. tributaries; and
 - c. on-channel reservoirs

The contribution from tributary indirect discharges to the mainstem will be determined based on site specific characteristics and best available information. Discharges to on-channel reservoirs will not be charged credits except: 1) where there are identified quantifiable seeps or areas of water resurfacing in the channel, or 2) active discharges from the reservoir (e.g. pumping or purposeful overflowing) as allowed by an individual, general or watershed based permit.

3. No credits will be charged against:
 - a. Discharges to off-channel pits, ponds, reservoirs or containment units.
 - b. Discharges that are treated to at or below established background ambient conditions.
4. Accumulation of salts in the channel reaching the Powder River will be offset by the conservative approach associated with charging credits for discharges to tributaries or on-channel reservoirs. The DEQ recognizes that the degree of offset will be dependent on the flow regime in the channel(s), the applicable discharge flow rate and other site specific channel characteristics. The allocation of credits will be checked against actual monitoring data.

IV. Registration Procedures

A. Establishing the Registrar

1. The DEQ will enter into an agreement with the WYGS whereby the WYGS will act as the Registrar and implement the Registration Procedures of this policy.
2. The WYGS will coordinate with the DEQ through the terms of an MOA, but will not have any regulatory function.

B. Initial Registration

1. CBNG operators will need to obtain credits for the discharge of produced water into the Powder River mainstem by registering with the WQD their operator of record acreage plus percent of mineral lease hold acreage where there is no operator of record. CBNG operators that do not register with the WQD their operator of record acreage plus percent of mineral lease hold acreage where there is no operator of record, will not be issued new, renewed or modified permits that allow discharges to the mainstem, tributaries or on-channel reservoirs (as described in III. B. 2. of this policy) within the Powder River watershed.
2. The WYGS will provide the WQD with a map and listing, by section, of the Powder River watershed giving calculated coal thicknesses to a minimum thickness of 10 feet.
3. The WQD will make available a map and listing, by section, of the Powder River watershed giving calculated coal thicknesses to a minimum thickness of 10 feet
4. Although it is recognized that different coal seams will produce varying volumes of water, for purposes of this policy it will be assumed that all coal seams will produce the same volume of water per measured unit.
5. To participate in the assimilative capacity allocation system CBNG Entities will need to register with the WQD the following information:
 - a. CBNG entity name, address, phone number, facsimile number and contact name;
 - b. The legal description of operator of record acreage plus percent of mineral lease hold acreage where there is no operator of record including the section designations;
 - c. The number of acres for which the CBNG entity is the operator of record plus percent of mineral lease hold where there is no operator of record within each section;
 - d. A summation of all acreage where the CBNG entity is the operator of record plus acreage of percent of mineral lease hold where there is no operator of record claimed by the CBNG entity within the Powder River watershed.
 - e. The name and contact information of the employee(s) authorized to revise submitted information.
 - f. The following statement, signed by a responsible official or employee of the CBNG entity: "Based upon reasonable investigation and/or inquiry of those preparing this

document and all attachments, I believe that the submitted information is true, complete and accurate.”

C. Processing of Registration Data

1. The WYGS will review the information submitted with the registration application.
 - a. Within 90 days for initial submissions and 30 days for updated submissions, the WYGS will notify the DEQ in writing of the number of approved credits for the CBNG Entity. The DEQ will issue the CBNG a credit voucher for the number of approved credits.
 - b. A CBNG entity has 30 days in which to contest the preliminary determination of approved credits pursuant to any dispute resolution procedures adopted by the DEQ. Until such time as the preliminary determination is changed, the preliminary determination will be used for calculating coal volumes.
2. The WYGS will calculate each CBNG entity’s allocation percentage as follows:
 - o Step 1: For each section, determine the acreage that is within the Powder River watershed within the defined coal boundary.
 - o Step 2: Using best available information, calculate the average coal thickness for each section to a minimum thickness of ten (10) feet.
 - o Step 3: Multiply the acreage for each section within the Powder River watershed by the calculated average coal thickness for each section.
 - o Step 4: Sum the calculations of all sections in Step 3. *(This value represents the total available coal volume to be allocated to the CBNG entities.)*
 - o Step 5: Determine volume of coals for each CBNG entity as follows:
 - Average coal thickness (by section) * acreage for which CBNG entity is the operator of record plus percent of mineral lease hold acreage where there is no operator of record in each section = total CBNG entity credits in the section.
 - o Step 6: Sum all section coal volumes for the CBNG entity and divide by the total available coal volume calculated in Step 4. *(This value represents the percentage of the assimilative capacity (minus the margin of safety) that will be allocated to the CBNG entity.)*
3. The WYGS will subtract the known allocations from the total available coal volume to calculate the unused capacity which will represent the “Unleased” category.
4. The DEQ will develop periodic summary reports of registration activity, including credits issued by company, total credits issued and total credits outstanding.
5. The DEQ will publish annually:
 - a. The “Basin Allocation Percentage” for each CBNG entity and the category “Unleased”.

- b. The “CBNG entity Allocation Percentage” for each CBNG entity will be the percentage of total coal volume excluding the category “Unleased.”
- c. A map giving the average coal thicknesses, by section, used to establish the above documents.

V. **Bank System**

A. **Establishment of Credit Bank**

1. The WQD will create a Credit Bank. The Bank will be housed within the WQD and will be designed to record, distribute and balance credits for each participating CBNG entity.
 - a. The WQD will record each CBNG entity's credits in the Bank in accordance with the credit voucher issued by the Registrar;
 - b. In no case will the number of credits held in the Bank be allowed to exceed the total available credits for the Powder River established by the Registrar;
 - c. The Bank will hold each CBNG entity's credits in separate accounts for each month;
 - d. CBNG entity's will apply for use of credits when applying for general, individual or watershed based permits for discharge to the mainstem, tributaries or on-channel reservoirs of the Powder River watershed.
 - e. The Bank will debit each CBNG entity's credit account in accordance with the credits identified in the approved CBNG effluent discharge permit(s).
 - f. The WQD will utilize the PRM Standardized tracking mechanism as the mechanism to regulate and notify parties of available credits.
 - g. The Bank will publish a periodic summary report of all transactions and balances 30 days after the end of each period.

B. **Notification of Designated Representative(s)**

Each CBNG entity participating in the Bank will provide the Bank with the current name(s) and contact information for its designated representative(s).

C. **Distribution of Credits**

1. Upon issuance of a permit, the Bank will deduct the amount of credits contained in the permit from the CBNG entity's account. In no case will the Bank issue credits for more than the number of credits remaining in the CBNG entity's account.

D. **Recordkeeping and Reporting**

1. The Bank will keep records of all transactions for each CBNG entity. On a periodic basis, the Bank will provide a statement of transactions to each CBNG entity.
2. The Bank records will be available consistent with access to other public documents.

E. **Credit Transfer**

1. Credits may be transferred among participating CBNG Entity's by issuance of a notice of transfer to the WQD.

Individual and Watershed Permit Interaction with Credits and Standardized tracking mechanism

A. Applicability and Scope

1. All CBNG produced water discharges into the Powder River mainstem, tributaries and on-channel reservoirs will require an applicable general, individual or watershed permit pursuant to Wyoming Water Quality Rules and Regulations Chapter 2.
2. Upon issuance and implementation of this policy, new and renewed CBNG produced water discharge permits in the Powder River mainstem, tributaries and on-channel reservoirs will be issued in conformance with available credits authorized by the PRM Standardized tracking mechanism as set forth in this policy guidance. Dischargers will continue to comply with their existing permits until reopened, renewed, or a major modification is made, at which time the individual permit will be brought into conformity with this policy.

B. Permit Application

Upon application for a new permit, a major modification to an existing permit, or permit renewal, the permit applicant will provide the following information:

1. A water management plan, demonstrating how the applicant plans to manage the CBNG produced water discharge through the use of credits, treatment, impoundment, or other measures.
2. The DEQ will administer and verify through the "Credit Bank" that the applicant has in place sufficient credits and/or water management facilities to implement the water management plan.

C. Conditions Included in Watershed/Individual Permit

The following conditions will be included in each watershed or individual permit, major modification, or renewal application, to integrate those permits with the PRM Standardized tracking mechanism:

1. A provision prohibiting any discharge to the Powder River mainstem, tributary thereto or on-channel reservoir in excess of the CBNG Entity's credits authorized under the PRM Standardized tracking mechanism.
2. The equations specifying how the number of credits consumed will be calculated for each discharge/outfall.
3. A requirement that the tributary confluence be monitored and reported, to the DEQ by the permittees, monthly.

The DEQ will evaluate the monthly monitoring results against what has been allocated on the tributary and throughout the Powder River Basin.