EY2011
Primary Roads Review

During a routine oversight inspection with the Wyoming LQD, an issue was raised regarding the implementation of Wyoming's approved reclamation program with respect to the design and construction of drainage systems for primary roads on Wyoming permits. For the EY2011 evaluation period performance agreement, OSM and LQD agreed to review this topic further. The issue in question was how the requirements of Chapter 2, Section 5 (a)(xvi) Road Systems and Chapter 4, Section 2 (j) Roads, of the Wyoming coal rules were being implemented.

There are three general aspects that OSM evaluated regarding Wyoming's implementation of its rules relating to the design, construction, and certification of primary road drainage systems. These are: 1) permitting/design documentation, 2) evaluation of processes for design, construction and certification, and 3) field verification that mine operators are following the approved design, construction, and certification requirements.

The CFO and LQD reviewed five permits throughout the State during the evaluation period to determine:

1) If there is an agreement between the regulatory authority and OSM as to the requirements of the approved State program (i.e. Do OSM and LQD interpret the requirements of the program the same?),

2) The State's method to check the operator's compliance with Wyoming's rules and the approved permit,

3) If the State routinely uses these verification methods,

4) If there are sufficient cross-sections, maps and designs in the permit to properly evaluate compliance with the approved permit and rules, and

5) If the State processes for evaluating design, construction, and certification of primary road drainage systems is consistent with the approved State program.

OSM and LQD evaluated the design, construction, and certification of primary road drainage systems for the selected permits by conducting field verification during oversight inspections.

PERMTS SELECTED FOR REVIEW:

1) Black Thunder Mine (Permit No. 233)
2) Jacobs Ranch Mine (Permit No. 271)
3) North Rochelle (Permit No. 550)
4) Antelope Mine (Permit No. 525)
5) Black Butte Mine (Permit No. 467)

PERMITS SELECTED FOR OVERSIGHT INSPECTION:

1) Black Thunder Mine (Permit No. 233)
2) Jacobs Ranch Mine (Permit No. 271)
3) North Rochelle (Permit No. 550)
4) Carbon Basin Mine (Permit No. 730)
5) Rawhide Mine (Permit No. 240)
6) Buckskin Mine (Permit No. 500)
7) Coal Creek Mine (Permit No. 483)

MINE SPECIFIC REVIEW:

1) Black Thunder Mine – A review of the current permit indicated that a plan for each road as required by Chapter 2 Section 5 (a)(xvi) of the Wyoming program was not included in the permit. This plan should contain maps, designs, and certifications of roads within the permit area. However, a recent permit revision for the Stuart Access Road for the new load out facility did address some, but not all, of the requirements for a roads plan. This revision package did contain a certified map of the proposed road and some of the parameters used in its design. The performance standards (Chapter 4 Section 2 (j) (D) (I) used to size the ditches and culverts for the area were not available (drainage size, soil type, cover, slope, etc.), so it was not possible to determine if the drainage system was adequate for the area involved.
During the field verification inspection, conducted for this permit on May 18, 2011. The review found that:
The "Mine Facilities" map (MP-2.1.1) and the "Haul Road, Access Road and Railroad Sections" (MP-2.2.2) are not certified by a Professional Engineer, as required by Wyoming DEQ Rules and Regulations: Chapter 2, Section 5(a) (xvi) (B). With the exception of the Stuart Access Road, the Operator has not properly certified the plan for all primary roads as required by, and according to, this Rule. Chapter 2, Section 5(a) (xvi) (A) (I) also states "Include a map, appropriate cross-sections, design drawings and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, drainage structures and low-water crossings." Again, with the exception of the Stuart Access Road design, The Operator has not provided this level of detail or design parameters in the plan for all their primary roads in their Facilities Map and/or their Haul Road, Access Road and Railroad Sections document to fulfill this requirement.-
As-built certifications for the mine roads were found to be compliant with Chapter 4 requirements.

The Black Thunder Mine permit is currently undergoing a major revision to combine the Black Thunder, Jacobs Ranch and North Rochelle permits into one permit. This major revision will address the concerns noted above.

2) Jacobs Ranch Mine –This permit does not appear to address the program requirements of Chapter 2 Section 5 regarding the need for a plan for each road. Documentation available (maps and cross sections) were uncertified. Culvert locations and sizes shown (Map MP-10) are not certified, nor are there any calculations demonstrating compliance with required storm event capability. During the field verification inspection, conducted on May 25, 2011. The review found that:
-The "Mine Facilities" map (MP-2) and the "Haul Road, Access Road and Railroad Sections" (MP-3) are not certified by a Professional Engineer, as required by Wyoming DEQ Rules and Regulations: Chapter 2, Section 5(a) (xvi) (B). As such, the Operator has not properly certified all primary roads as required by, and according to, this Rule.

-Chapter 2, Section 5(a) (xvi) (A) (I) also states "Include a map, appropriate cross-sections, design drawings and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, drainage structures and low-water crossings." With the exception of the West Rail Loop (which shows culvert designs), The Operator has not provided this level of detail or design parameters for all their primary roads in their Facilities Map and/or their Haul Road, Access Road and Railroad Sections document to fulfill this requirement.

-As-built certifications for the mine roads were found to be compliant with Chapter 4 requirements.

The Jacobs Ranch Mine permit is currently undergoing a major revision to be combined with the Black Thunder and North Rochelle permits. This major revision will address the concerns noted above.

3) North Rochelle Mine – The mine facilities map (MP-3) was uncertified, did not identify or distinguish between primary or ancillary roads. There were no cross sections for roads, designs for ditches, culverts, bridges or low water crossings. There was no documentation or certification that constructed ditches can handle a design storm event. There are no as-built drawings or certifications for roads. The proposed locations for future roads (to evaluate impact to environment) were not depicted on any maps and the subject of roads reclamation was not addressed. Overall, it does not appear that the program requirements for Chapter 2 were addressed by the permit.

During the field verification inspection, conducted on May 18, 2011. The review found that:
-Chapter 2, Section 5(a) (xvi) (A) (I) states "Include a map, appropriate cross-sections, design drawings and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, drainage structures and low-water crossings." The Operator has not provided this level of

detail or design parameters for their primary roads in their Facilities Map and/or their Typical Haul and Access Road Cross-sections document to fulfill this requirement.

-As-built certifications for the mine roads were found to be compliant with Chapter 4 requirements.

The North Rochelle Mine permit is currently undergoing a major revision to be combined with the Black Thunder and Jacobs Ranch permits into one permit. This major revision will address the concerns noted above.

4) Antelope Mine – Permit review indicated that overall, this permit appears to address the requirements of the Wyoming program. However, the certifications as required by Chapter 4, Section 2(j)(vii) are not present in the LQD/ Cheyenne office. A discussion with one of the LQD inspectors for this mine indicated that certifications are on file at the mine offices and available for review during inspections. Even if this is the case, the permit is still not in compliance with the Wyoming program since the rules require that this information be submitted to the Administrator. However, the data is at least available for LQD use when visiting the mine.

5) Black Butte Mine – A review of the permit indicated that overall, the permit is in compliance with the Wyoming rules. The mine plan section of the permit contains maps (MP46-49) indicating where the primary roads are located. The maps have not however, been updated to include the haulroad designs for the Pit 14 most recent amendment (9-23-2010). The permit also contains tables and calculations for culverts, channels and diversions (Tables MP-30-32). There was an issue regarding the certification of roads maps for the permit. The issue was that the certification used in the permit was worded the same for the design and the as-built construction of the roads. LQD staff in Lander said that discrepancy would be corrected as soon as the mine could be contacted.

6) Carbon Basin-Elk Mountain Mine – The design, construction, and certification of primary roads was also reviewed as part of a partial oversight inspection, conducted on June 23, 2011. The review found that the main haul road map (MP-3) and the required associated design drawings and specifications are not properly certified by a Professional Engineer, as required by Wyoming DEQ Rules and Regulations: Chapter 2, Section 5(a) (xvi) (B), which states : "The plans and drawings for each primary road (as defined in Chapter 4, Section 2(j)(i)(B)) shall be prepared by, or under the direction of, and certified by a qualified registered professional engineer as meeting the requirements of this Chapter and current, prudent engineering practices." As such, the Operator has not properly certified all primary roads, plans, and drawings; as required by, and according to, this Rule. (**Note**: the documents described above are "certified", but with incorrect language and/or content.)

7) Rawhide Mine - The design, construction, and certification of primary roads was also reviewed as part of a complete oversight inspection, conducted on June 14, 2011. The review found that: As-built certifications for the mine roads were found to be compliant with Chapter 4 requirements. The Primary Haul Road / Access Road Plan is certified by a Professional Engineer, as required by Wyoming DEQ Rules and Regulations: Chapter 2, Section 5(a) (xvi) (B), which states "The plans and drawings for each primary road (as defined in Chapter 4, Section 2(j)(i)(B)) shall be prepared by, or under the direction of, and certified by a qualified registered professional engineer as meeting the requirements of this Chapter and current, prudent engineering practices." As such, the Operator has certified the plan for all primary roads as required.

The Primary Haul Road / Access Road plan does not contain the detail required by Chapter 2, Section 5(a) (xvi) (A) (I); "Include a map, appropriate cross-sections, design drawings and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, drainage structures and low-water crossings." The drainage control for each Haul Road / Access Road shall be designed to safely pass the peak runoff from a 10-year, 6 hour precipitation event as required by Chapter 4, Section 2 (j)(vii)(D)(I).

Section 3.2 of the Rawhide permit does contain a permit commitment for culverts to pass at least a 10-year, 6-hour event. These specifications have not been submitted to the Department nor are they on file within the approved permit.

8) Buckskin Mine - The design, construction, and certification of primary roads was also reviewed as part of a complete oversight inspection, conducted on June 15, 2011. The review found that: As-built certifications for the mine roads were found to be compliant with Chapter 4 requirements. The plan for each Haul Road / Access Road contains a typical design for each and is certified by a Professional Engineer, as required by Wyoming DEQ Rules and Regulations: Chapter 2, Section 5(a) (xix) (B), which states "The plans and drawings for each primary road (as defined in Chapter 4, Section 2(j)(i)(B)) shall be prepared by, or under the direction of, and certified by a qualified registered professional engineer as meeting the requirements of this Chapter and current, prudent engineering practices." As such, the Operator has properly certified all primary roads as required. However, the Haul Road / Access Road plan does not contain the detail required by Wyoming DEQ Rules and Regulations: Chapter 2, Section 5(a) (xvi) (A) (I) also states "Include a map, appropriate cross-sections, design drawings and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, drainage structures and low-water crossings." The drainage control for each Haul Road / Access Road shall be designed to safely pass the peak runoff from a 10-year, 6 hour precipitation event as required by Chapter 4, Section 2 (j)(vii)(D)(I).

9) Coal Creek Mine -This issue was also reviewed as part of a partial oversight inspection, conducted on June 17, 2011. The review found that: As-built certifications for the mine roads were found to be compliant with Chapter 4 requirements. The plan for each Primary Haul Road / Access Road has been certified by a qualified registered professional engineer as meeting the requirements of this Chapter and current, prudent engineering practices.

However, the approved permit contains MP-3.5.1 Surface Water Control Map which identifies the location and size of each culvert and drainage ditch; however, it does not contain the designs for each. The Haul Road / Access Road plan does not contain the detail required by Chapter 2, Section 5(a) (xvi) (A) (I) which states, "Include a map, appropriate cross-sections, design drawings and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, drainage structures and low-water crossings." The drainage control for each Haul Road / Access Road shall be designed to safely pass the peak runoff from a 10-year, 6 hour precipitation event as required by Chapter 4, Section 2 (j)(vii)(D)(I). As such, the approved plan does not contain the information as required.

FINDINGS: After conducting the permit reviews and field inspections, the CFO has the following findings:

1) There is no specific written agreement between OSM and the LQD other than the plain reading of the Wyoming rules in Chapters 2 and 4 of the Coal Rules and Regulations, regarding the requirements for certification of primary roads. The LQD has an Instructional Memorandum (IM 25), that addresses the certification of impoundments and roads. IM 25 Section III (C) (ii) states that if runoff from a road passes into an approved sedimentation control structure the certification of the sedimentation control structure eliminates the need to also certify the road. However, the issue of whether or not road drainage is directed into the pit or sediment control structures is not the only consideration when certifying primary roads. The requirement (Chap. 4, Sect.2(j)(vii)) to adequately design, construct, maintain and reclaim primary roads is also necessary to ensure that the roads are sized and designed to allow the large mine vehicles and equipment that use them to operate in a safe and efficient manner. In short, all primary roads must be certified as adequate for their intended use.

There also appears to be differences between the LQD district offices and the mine operators in how the rules are interpreted and implemented. Wyoming's program (Chapter 2, Section 5 (xvi)) specifies that an applicant submit plans and drawings for primary roads that have been certified as meeting the requirements of the program, to the LQD. OSM's review of the selected permits did not find such plans, designs, or certifications for primary roads on file with the LQD for all the sample mines reviewed. LQD staff indicated that these plans, while not submitted to the Administrator, were on file at the mines and available for review

during on-site inspections. However, during field verification inspections, some of the mines could not readily produce this information.
2) When the LQD reviews and approves the permits, they approve a "typical" road design that addresses the basics (width, surfacing material, and side slopes, etc.) for road construction, but does not address the specifics for design and construction (drainage area, soil type, slope, cover, etc.) of drainage controls to protect the road.
3) Each of the three LQD district offices approach review and approval of drainage control for primary roads a little differently and the level of compliance from the mine operators is also inconsistent. Some mines do a good job of providing enough information in the permit to evaluate the mine roads program, while others do not. While LQD policy has never been to support poor design or incorrect sizing of culverts and ditches related to road construction, permit documentation to verify the adequacy of such structures is inconsistent in the permits reviewed.
4) As mentioned above, our review indicated that some permits were better than others at providing the necessary data to determine the correct sizing of drainage structures for primary roads. It should also be noted that some permits have gone through an evolutionary process and are submitting improved documentation to the LQD on the more recent road designs. Other permits are currently going through a major revision that will incorporate changes to the roads issues identified by this review.
5) The state's process for evaluating the design, construction, and certification of primary road drainage systems appears to be inconsistent with its approved program in various ways. Some of the mine operators appear to be in compliance while others are not.
6) During this evaluation period, no roads related problems were identified during oversight inspections and historically, few roads issues have been raised.

CORRECTIVE ACTION:

Due to the deficiencies and inconsistencies found in the implementation of the Wyoming program regarding permit requirements for road plans, OSM recommends that the LQD send a directive to all the Wyoming coal mine operators and its district offices. This directive should delineate the requirements of the Wyoming rules with specific instructions as to what information, data and certifications are necessary to meet compliance with the program. The LQD should issue the directive and complete all required permit revisions within 180 days. If LQD anticipates that the corrective action will exceed the 180 days, OSM and LQD will develop a formal corrective action plan to address the issue.

September 8, 2011

WDEQ Land Quality Division Response to OSM EY2011 Primary Road Review

OSM has revised their draft report. Detail has been added to OSM comments after WDEQ/LQD responses.
Further WDEQ/LQD response is provided below.

Findings:

3) It is stated that "Past LQD policy has been as long as no sediment can leave the permit area (all drainage is to the pit or ponds), the correct sizing of culverts and ditches is not necessary".

This statement is not accurate. LQD IM25 explains that because water quality is being protected when runoff from roads is contained and/or treated by sediment control structures, no professional certification of road designs is required. WDEQ/LQD policy has never been to support poor design or incorrect sizing of culverts and ditches related to road construction.

The LQD requests that this statement be removed from this report. The LQD will revise IM25 to be in line with current regulations.

OSM agrees with the comment above and has revised the annual report and roads report to reflect the LQD concerns.