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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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December 9, 1993

Mr. Michael W. Glasson
Andalex Resources, Inc.
P. O. Box 902
Price, Utah 84501

Re: Deficiencies in Diversion Designs, Andalex Resources, Inc., Centennial Project, ACT/007/019-93E, Folder #3, Carbon County, Utah

Dear Mr. Glasson:

The Division has completed a review of your amendment concerning diversion designs. At this time the submittal is not considered complete and cannot be approved. A number of deficiencies have been identified which will need to be corrected. The enclosed technical memo discusses the deficiencies. Please review the memo and correct the problems identified. You should resubmit the corrected amendment by no later than January 7, 1994. If you have questions, please contact me or Steven Johnson.

Sincerely

A handwritten signature in black ink that reads "Daron R. Haddock".
Daron R. Haddock
Permit Supervisor

cc: S. Johnson
S. Demczak
DIVEDSI.CEN





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November 29, 1993

TO: File

THRU: Daron Haddock, Permit Supervisor

FROM: Steven M. Johnson, Reclamation Hydrologist 

RE: Diversion Designs, Andalex Resources, Centennial Project,
ACT/007/019-93E, Folder #2, Carbon County, Utah

SUMMARY

An application for a permit change was submitted to the Division, concerning designs of the diversions at the Centennial Project. The changes in the application consist of reclassification of existing diversions, and designs of newly classified diversions. The hydrology of this package was reviewed by the Division on November 29, 1993.

ANALYSIS

R645-301-120 Permit Application Clear and Accurate

Proposal:

A runoff curve number of 70 was used for all undisturbed areas, except for the undisturbed culvert diversions, which use a CN of 65. A curve number of 90 was used for the disturbed area.

Loose rock check dams will be placed at the discharge points of UD-4 and UD-5, for energy dissipation. The dams will be constructed as described in Figure IV-9 and located as shown on Plate 8.

Culvert CD-1 has a required diameter of 1.23-feet, and the diameter of the culvert in place is 1.00-feet. Culvert CD-2 has a required diameter of 1.02-feet, and the diameter in place is 1.00-feet.



Analysis:

Paragraph 6, page 160-A, states that a rock check dam is used for energy dissipation at the discharge point of UD-4 and UD-5. These are to be located on Plate 8. UD-4 is properly marked; however, the check dam on UD-5 cannot be found. Figure IV-9 describing these check dams is included in the plan as a blank page.

The curve number for all disturbed areas is 90. It is assumed that calculations of the time of concentration for disturbed areas should have been made using a weighted average of the disturbed area CN (90) and the undisturbed area CN (70); however, the calculations in the plan appear to have been made with a curve number of 70. This could, potentially, result in under designed channels. For example, when 90 is used for disturbed area in designing the channel DD-2, the channel should have been about 0.5-feet deeper than the design in the plan.

The diameter required to pass flows through CD-1 and CD-2 are larger than the diameters of the culverts in place (Table IV-3, page 170). A foot note to this table states that adequate headwater is available to pass flow, but no proof is given to show that water could flow through these culverts as designed.

Deficiency:

1. Clearly mark the location of the rock check dam for UD-4 and UD-5 on Plate 8, as stated on page 160-A. Include Figure IV-9, describing the rock check dams, as stated in the plan.
2. A curve number of 90 should be used for disturbed areas in calculating the flow as the operator states on page 159, rather than using the undisturbed curve number of 70, as was done on pages 169 and 169-A.
3. The flows through culverts CD-1 and CD-2 require greater diameters than that of the culverts currently in place. If there is currently a method to contain this flow in place it must be shown; otherwise, provide larger culverts at these locations.

RECOMMENDATION

This plan is generally technically complete; however, there are some items that are erroneously calculated, missing, and confusing that should be cleared up before it is approvable. The deficiencies listed above should be corrected to make the plan complete and accurate. There are also further recommendations that will help satisfy other requirements of the plan.

First, on page 160, paragraph 2, it is stated that culvert C-15 will be monitored after each major storm event for erosion. This statement does not include a means or method for monitoring the erosion. Without a specific method, evidence of erosion may be overlooked until an event causes major damage. A quantitative method of monitoring erosion could allow the operator the ability to correct erosion before expensive or irreversible damage is caused.

Second, a curve number of 70 is generally used for all undisturbed calculations. However, in designing the undisturbed culverts a curve number of 65 is used. Only a sort statement is given to declare the difference. This is confusing, and an explanation should be given showing why the different numbers are used.

Third, all channel designs are given by showing the flow, required depth, and required flow area. Two figures, Figure IV-3 and Figure IV-4, show generic cross-sections for V-shaped ditches, and Figure IV-3A shows a generic trapezoidal cross-section. Information identifying which channels are designed as V-shaped and which are trapezoidal could not be found in the plan. This information can make a large difference in the final designs of a channel and should be included in the plan.

Finally, several items should be updated and included in the final plan. The Table of Contents, List of Figures, and List of Tables should reflect the changes proposed in this permit change. An apparent typographical error appears on page 158, paragraph 1. Here an undisturbed diversion is mentioned by the name UP-1. All others of this type are given the name UD-1.