



A C Z INC.

ENGINEERING AND ENVIRONMENTAL DIVISION
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P.O. BOX 774018
STEAMBOAT SPRINGS, CO 80477

October 11, 1984

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DIVISION OF OIL
GAS & MINING

FILE COPY

Mr. Thomas Wright
Mining Field Specialist
Utah Department of Natural Resources
Division of Oil, Gas & Mining
4241 State Office Building
Salt Lake City, Utah 84114

Re: 10/10/84 Site Visit to North American Equities
Blazon No. 1 Mine

Dear Tom:

After having talked with you on the phone several times, I enjoyed having the opportunity to meet you in person. It was helpful for me to observe the site conditions at the Blazon No. 1 Mine first-hand and your comments as we toured the site highlighted existing and potential problems of concern to the Division.

I have reviewed the Blazon permit application (PAP-5/84), and it appears that Culvert F, which has become a problem due to blockage, was in place prior to completion of the final drainage and sediment control calculations. The culvert sizing calculation for Culvert F presented in the permit application (Exhibit 8) did, however, confirm the adequacy of the existing 8" culvert to pass the peak runoff from a 100-year, 24-hour storm event for the contributing disturbed drainage area.

Due to the amount of material covering the existing culvert (Culvert F), it appears impractical to excavate and either repair or replace this culvert. Consequently, North American Equities (NAE) plans to install a new culvert with its inlet at approximately the same location as the existing culvert. The new culvert will be placed in a shallow trench running from the inlet through the narrow portion of the mine development waste pile to a daylight point immediately west of the waste pile. A second culvert section, joined to the first by a pipe elbow, will carry the flow down the hillslope where it will discharge to Ditch B. NAE will place suitable riprap material at both the inlet and discharge of the new culvert to minimize erosion and

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will place a trash rack at the inlet to prevent future blockage. I have enclosed culvert sizing calculations for both segments of the new culvert (Designated Culvert F') as well as the original culvert for your reference. Also enclosed is Map 9, Blazon No. 1 Mine - Surface Facilities, which shows the location of the new culvert and a detail sketch illustrating trash rack construction.

Please review the enclosed information and contact me as soon as possible with approval for the planned abatement measures and any comments you may have. I am currently reviewing the other items which we discussed and preparing a plan for site maintenance work to be submitted to NAE management for review.

Again, I enjoyed meeting you and appreciate your cooperation and assistance. As I indicated, ACZ INC., as North American Equities' agent, is concerned with identifying and addressing any potential problems at the Blazon No. 1 Mine before the problems become a serious concern. In order to be successful, we need to maintain open lines of communication with the Division. I invite you to call me with any questions or concerns which arise relating to the Blazon No. 1 Mine.

Sincerely,

ACZ INC.



Jerry M. Nettleton

JMN/ig

cc: Alan W. Smith - North American Equities



CULVERT DESIGN CRITERIA

- Peak discharge for the area contributing runoff to the culvert was determined by the Rational Method

$$Q = CiA$$

where: Q = peak discharge in cfs
C = coefficient of imperviousness
i = rainfall intensity (design event) in in/hr
A = drainage area in square feet

- Flow capacity for a given culvert size was determined using Manning's Equation

$$Q = VA = \frac{0.59}{n} D^{2/3} S^{1/2} A$$

where: Q = discharge of culvert in cfs
n = roughness coefficient of culvert
D = diameter of culvert in ft
S = slope of culvert
A = cross sectional area of culvert in cu ft

- Flow capacity was compared with peak discharge to confirm the suitability of existing culverts or verify the suitability of the standard culvert size selected for the application

Culvert F' - Section 1

Area - 13500 ft²
0.32 acres

Design Event - 100 yr/24 hr

Design Peak Discharge - $Q = CiA$

$$C = 0.60$$

$$i = 0.15 \text{ in/hr}$$

$$A = 13500 \text{ ft}^2$$

$$Q = 0.60 (0.15/12)(13500)(1/3600) = 0.028 \text{ cfs}$$

Culvert Length - 60 ft

Culvert Slope - 5°

$$\text{Culvert Flow Capacity} - Q = VA = \frac{0.59}{n} D^{2/3} S^{1/2} A$$

$$n = 0.022$$

$$D = 0.667 \text{ (8" culvert)}$$

$$S = 0.05$$

$$A = 0.349$$

$$Q = 0.59/0.022 (0.667)^{2/3} (0.05)^{1/2} (0.349) = 1.60 \text{ cfs}$$

Culvert F¹ - Section 2

Area - 13500 ft²
0.32 acres

Design Event - 100 yr/24 hr

Design Peak Discharge - $Q = CiA$

$$C = 0.60$$

$$i = 0.15 \text{ in/hr}$$

$$A = 13500 \text{ ft}^2$$

$$Q = 0.60 (0.15/12)(13500)(1/3600) = 0.028 \text{ cfs}$$

Culvert Length - 130 ft

Culvert Slope - 25°

Culvert Flow Capacity - $Q = VA = \frac{0.59}{n} D^{2/3} S^{1/2} A$

$$n = 0.022$$

$$D = 0.667 \text{ (8" culvert)}$$

$$S = 0.25$$

$$A = 0.349$$

$$Q = 0.59/0.022 (0.667)^{2/3} (0.25)^{1/2} (0.349) = 3.57 \text{ cfs}$$

Culvert F

Area	<u>Description</u>
	Disturbed
Total: 10,800 ft ² 0.25 acres	
Design Event	100 year, 24 hour
Design Peak Discharge	0.023 cfs
Culvert Length	150 ft
Culvert Slope	23%

$$Q = \frac{0.59}{0.022} (.667)^{2/3} (.23)^{2/3} (.23)^{1/2} (1.39)$$

$$Q = 4.49$$

$$n = 0.022$$

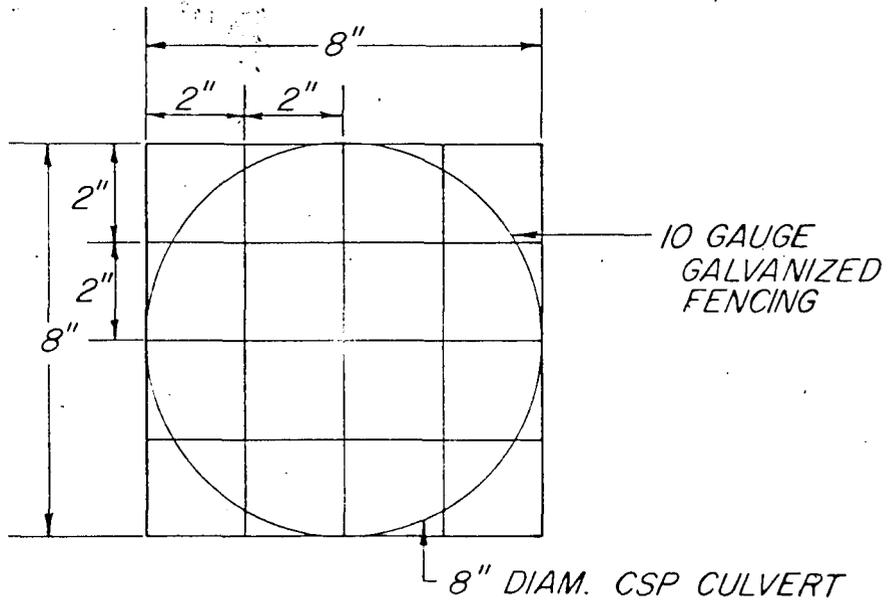
$$D = 8" - .667 \text{ ft}$$

$$S = 0.23$$

$$A = 0.349 \text{ ft}^2$$

$$Q = \frac{0.59}{0.022} (.667)^{2/3} (.23)^{2/3} (0.349) = 3.38 \text{ cfs}$$

The existing culvert F can discharge a storm runoff of approximately 3.38 cfs, therefore, it is adequate to pass the 100 year, 24 hour storm.



NORTH AMERICAN EQUITIES
TYPICAL TRASHRACK STRUCTURE
FOR SMALL DIAMETER CULVERTS
FIGURE II