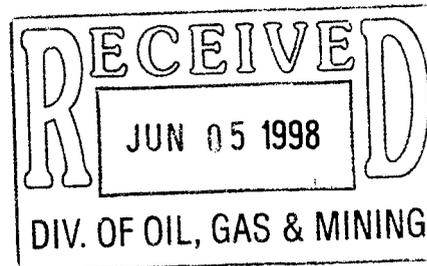




Date: June 1, 1998
Subject: Dugout Canyon Mine
From: Ken Payne
To: File



Re: Brush Fire and Mud Slide

*ACT 1007/039 #2
 Copy Daron*

Brush Fire:

A fire started in slash piles above the Dugout minesite area on May 19, 1998. The fire was first noticed at about 1:30 pm by one of the timber contractors. The exact cause of the fire is still unknown but it is being investigated by both the BLM Law Enforcement and the Carbon County Sheriff Dept. The fire was contained for the most part during the same night by fire fighters from several agencies. The extent of the fire was estimated to be about 80 acres the following day by some of the personnel that were fighting the fire. The fire area was inspected last week from an advantage point above the fire area. The extent of the fire is about 25 acres in-lieu of the 80 acres that was reported originally.

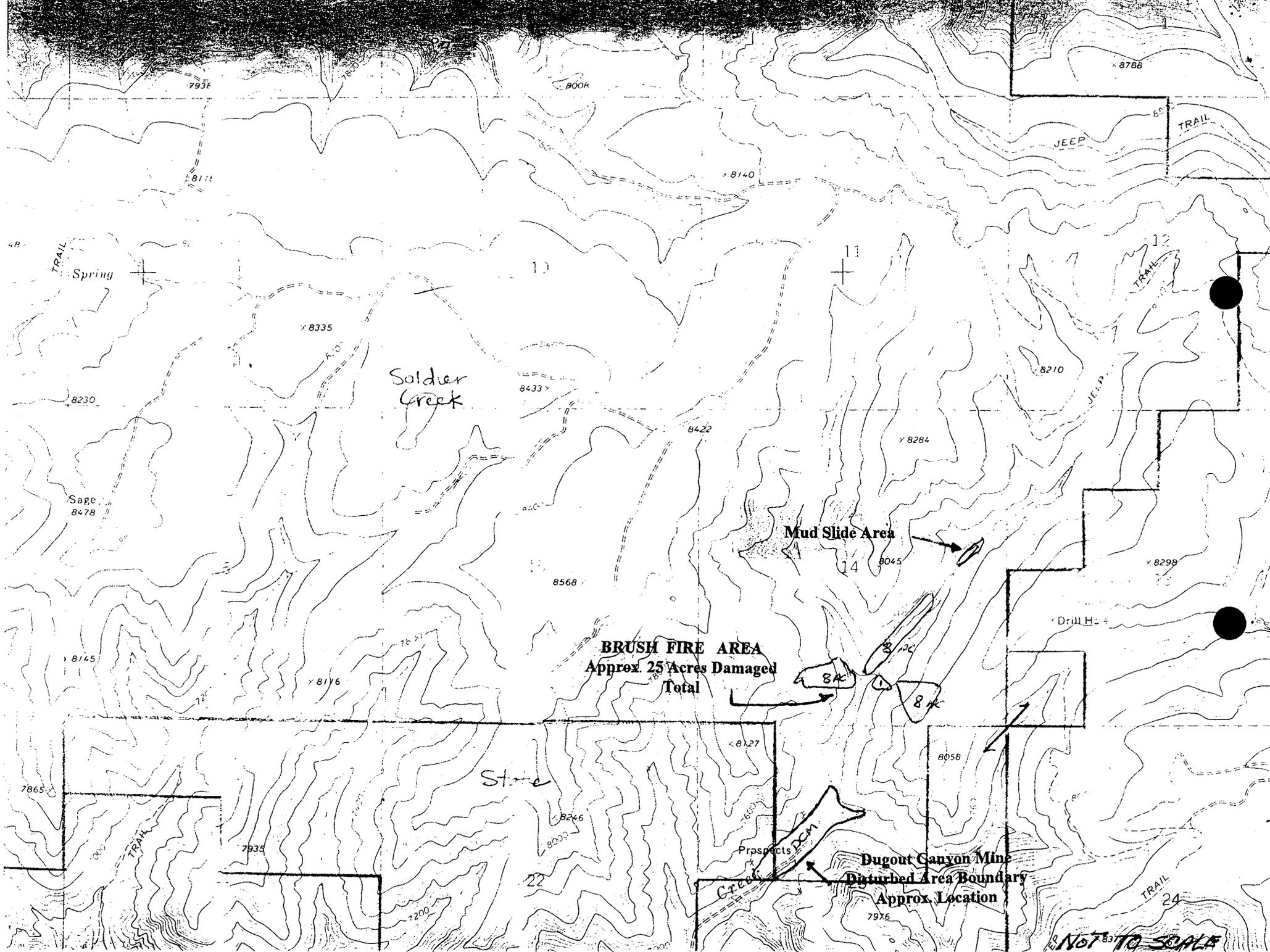
There were some concern initially that the additional acreage of loss vegetation would cause some affect on the water shed curve numbers that were used to calculate the size of the culvert to be placed in the Dugout creek through the minesite area. Both CEntry Engineering and EarthFax Engineering re-checked the water shed curve calculations with an additional 80 acres loss vegetation. The proposed 60" culvert remains adequate. Thus, the 25 acre burn should not create a water shed problem. The attached letter and calculations from EarthFax Engineering confirm the curve numbers used.

Canyon Fuel Co. planted about 300 willow starts in the Dugout creek east fork 4 days before the fire started. The planting area is above where the fire started. However, the fire spread so quickly due to the high winds only a few of the willows were damaged. The willow planting is a portion the mitigation associated with the loss of riparian vegetation in the minesite area .

Mud Slide:

A mud slide re-occurred about a month ago above the Dugout minesite area. The old slide area is above the area where the fire occurred and currently has the logging road blocked. There is no damage to the Dugout creek below the logging road. The slide will be cleared as soon as the road dries. Some type of prevention measures will be implemented later this year to attempt to minimize another slide next spring. The slide area is not on the Dugout Canyon minesite disturbed area but it is on private property controlled by Canyon Fuel Co.

Distribution: R.D. Pick
 Rick Olsen
 Dave Spillman
 Steve Nye
 Daron Haddock - Division of Oil, Gas and Mining
 Steve Demczak - Division of Oil, Gas and Mining
 Mark Mackiewicz - Bureau of Land Management



Soldier
Creek

Mud Slide Area

BRUSH FIRE AREA
Approx. 25 Acres Damaged
Total

Dugout Canyon Mine
Disturbed Area Boundary
Approx. Location

NOT TO SCALE

EarthFax

MEMORANDUM

To: Ken Payne
From: Rich White *RW*
Subject: Affect of Fire on Runoff to UC-5
Date: May 22, 1998

Attached please find calculations to evaluate the effect of the recent fire on runoff to the inlet of culvert UC-5 (the bypass culvert in the left fork of Dugout Creek). Calculations were based on a burn area of 80 acres, with runoff conditions in the burn area equivalent to the mine yard (i.e., compacted soil, no cover). Under these conditions, runoff to the inlet of UC-5 increases from 90.4 cfs (pre-burn estimate) to 102.8 cfs (post-burn estimate). The culvert has a capacity of 120 cfs at its inlet. Therefore, the burn does not affect runoff sufficiently to exceed the capacity of the culvert.

As we have stated before, the design presented in the Mining and Reclamation plan is a minimum design. A larger culvert or other improvements can be implemented if desired to increase the capacity of the main bypass culverts. If this is desired, your primary options are:

- Increase the diameter of both UC-4 (the right fork culvert) and UC-5 (the left fork culvert). The existing 60-inch diameter corrugated metal pipe ("CMP") culvert has a capacity of approximately 120 cfs. In contrast, a 72-inch diameter CMP culvert has a capacity of approximately 200 cfs, while an 84-inch diameter CMP culvert has a capacity of about 290 cfs.
- Install hydraulic improvements at the culvert inlets. These improvements include structures known as beveled inlets, side-tapered inlets, and slope-tapered inlets. Since the capacity of the culvert will be controlled by its inlet hydraulics, increasing the capacity at the inlet may be more cost effective than increasing the diameter for its entire length. A detailed design would be required to evaluate each of the inlet options. However, it is roughly estimated that the inlets could be modified to increase the capacity of the 60-inch diameter CMP culverts to about 140 to 180 cfs.

Let me know if you need additional information.

EARTHFAX ENGINEERING, INC.
ENGINEERS / SCIENTISTS

PROJECT UC-605-01 PAGE 1 OF 3
COMPUTED RSW DATE 22 May 1998
CHECKED _____ DATE _____

AFFECT OF FIRE ON
CULVERT DESIGN,
DUGOUT CANYON MINE

Watershed → ODCWS - 1A (to culvert UC-5)

$$\left. \begin{array}{l} \text{Area} = 1794.7 \text{ ac} \\ \text{Avg CN} = 66 \end{array} \right\} \text{Pre-fire}$$

$$\left. \begin{array}{l} \text{Area} = 1714.7 \text{ ac @ CN} = 66 \\ = 80.0 \text{ ac @ CN} = 90 \end{array} \right\} \text{Post-fire (Avg CN} = 67)$$

New time of concentration:

$$S = 4.93$$

$$l = 15,200 \text{ ft}$$

$$Y = 42.2\%$$

$$L = \frac{(15,200)^{0.8} (4.93 + 1)^{0.7}}{1900 \sqrt{42.2}} = 0.62 \text{ hr}$$

$$T_c = 1.67 L = 1.04 \text{ hr}$$

Peak flow from 100-yr, 6-hr event:

$$Q = 102.8 \text{ cfs (see pg 2 of this calc.)}$$

60-inch CMP adequate (see nomograph on pg 3)

2/3

EARTHFAX ENGINEERING, INC.
HYDROGRAPH GENERATION PROGRAM OUTPUT
BASED ON SCS CURVE NUMBER METHODOLOGY

INPUT FOR: ODCWS-1A POST-FIRE

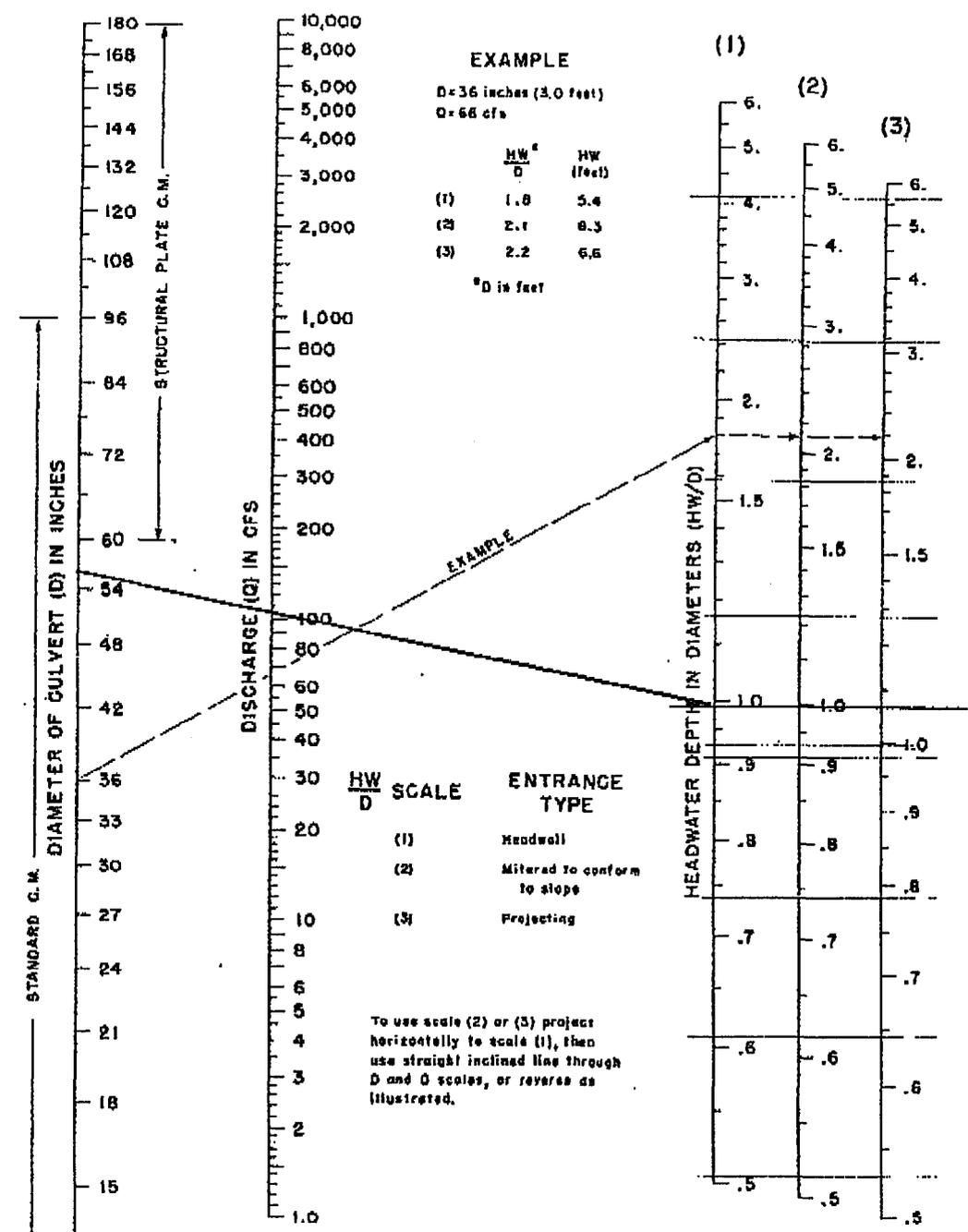
STORM :		WATERSHED :	
Dist.=SCS Type 'b' - 6 Hr		Area = 1794.70	acres
Depth = 2.05	inches	CN = 67.00	
Duration = 6.00	hrs	Time conc.= 1.040	hrs

OUTPUT SUMMARY

Runoff depth	0.18932	inches	
Initial abstr	0.98507	inches	
Peak flow =	102.79	cfs	(0.05680 iph)
at time	4.160	hrs	

3/3

CHART 5



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

5-25