

0018



1407 West North Temple  
P.O. Box 899  
Salt Lake City, Utah 84110

*Mrs. Fols*  
*J. Whitehead*  
*W. Hechberg*  
**RECEIVED**  
JUL 16 1986

**DIVISION OF  
OIL, GAS & MINING**

*W. Hechberg*

July 16, 1986

*Trail Mtn. Coal Co.*  
*ACT/015/019*

Mr. Lowell P. Braxton  
Administrator; Mineral Resource Development  
and Reclamation Program  
State of Utah  
Department of Natural Resources  
Division of Oil, Gas & Mining  
355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203

Subject: Cottonwood Fan Portal Hydrology

Dear Mr. Braxton:

Submitted under separate cover are three copies of proposed hydrological changes necessary to accommodate the county road upgrading in Cottonwood Canyon.

As the new paved road primarily benefits Trail Mountain Coal Company we have been in contact with personnel from Trail Mountain Coal Company and the engineering consultant for the county. We believe we have worked out most of the problems except the added responsibility risk that the new road could pose. However, elimination of the lower sedimentation pond is justification in itself.

Thank you for your prompt consideration.

Sincerely yours

C. E. Shingleton  
Director of Property Management  
Mining Division

CES:bb:5466  
Enclosure

cc: Larry Guymon  
Val Payne

Department of Health, Division of Environmental Health has certified its compliance with State Water Quality Standards.

Water

No fresh water will be required in the operation of the proposed Cottonwood Portal nor will any waste water be generated or discharged. Measures to protect the hydrologic balance will take the form of diversions, ditches and sedimentation ponds.

Mine Water

There will be no mine water discharge from the Cottonwood Portal.

**RECEIVED**  
JUL 16 1986

COTTONWOOD FAN PORTAL

HYDROLOGICAL DESIGN

DIVISION OF  
OIL, GAS & MINING

The present disturbed area resulted as an action approved under a division exploratory license and subsequently included in the Wilberg coal mining permit.

Water quality and sediment control is accomplished by means of diversion culverts and small sedimentation ponds operated in series. Recent developments between Emery County and Trail Mountain Coal Mine have resulted in an agreement to reconstruct the existing road for purposes of providing an upgraded public transportation system to Trail Mountain Coal Company.

To accommodate the new road Utah Power & Light Company has agreed to modify its existing hydrological facilities.

Present facilities include three small sedimentation ponds linked together for providing control of runoff water from three areas (see hydrological Map CM-10501-CP). They are: sub-area 6 and 7, topsoil and subsoil storage areas, sub-areas 3 and 4, the original disturbed area, and sub-area 5.

It is proposed to eliminate the lowest catch basin, which provides protection of a small 1.8 acre area, sub-area 5, and substitute the old catch basin with four (4) small gabions placed across the road drainage ditch. Placement and spacing of gabions are designed to divide the revegetated area into four equal parts of approximately .45 acres.

Construction of the gabion will coincide with construction of the new county road and will be built as shown on the included drawing. Cleaning will correspond to the rate of runoff and sediment accumulation. For gabion placement and road centerline location refer to "Proposed Cottonwood Road Alignment - Proposed UP&L Drainage System" map.

It has been judged that pooling of the gabions afford at least the same or better water treatment than did the old sedimentation catch basin. Diversions will consist of open ditches and culverts sized and placed as shown on the highway location drawing and the hydrological map enclosed. Runoff values are taken as shown in the text and derived from calculations formed in Appendix XIX.

Disturbed Area

1. Disturbed area requiring water protection.

a. Exploration site sub-areas:

Area 3	2.0 acres
Area 4	2.0 acres
Area 5	1.8 acres
Area 6	.5 acres
Topsoil pile	<u>.1 acres</u>
Total Disturbed Area	6.4 acres

2. Runoff area to be diverted with culverts:

a. Disturbed area	6.4 acres
b. Sub-area 7	<u>1.8 acres</u>
	8.2 acres

3. Upper culvert - C-1 36" culvert existing.

a. Sub-area 2	65 acres
---------------	----------

4. Middle culvert - C-2 24" culvert proposed.

a. Sub-areas 3,4,6,7	6.3 acres
----------------------	-----------

5. Lower culvert - C-3 - 24" culvert proposed.

a. Sub-area 5	1.8 acres
---------------	-----------

6. County road culvert - 48" culvert proposed.

a. Sub-area 2	30 acres
---------------	----------

Existing aspect is an east slope at elevation 7,300 feet above sea level. Average slope measures 55-60% with a moderate vegetation cover.

### Culvert Determination

Drainages identified on drawing CM-10501-CP have been designed to utilize four separate culverts to conduit flows associated with the Cottonwood fan portal area. An existing 36 inch culvert designated C-1 and an unmarked 48 inch culvert to be installed by the county at station 147+00 will pass the undistributed runoff from areas 1 & 2, an area of approximately 95 acres.

Sub-areas 3, 4, 6 and 7 are controlled by culvert C-2, a 24 inch CMP fitted with two drop drains. This culvert will pass the runoff from most of the disturbed area and secondly, the runoff from the road surface itself.

Sub-areas 3	2 acres	1 CFS
4	2 acres	1 CFS
5 & 7	<u>2.3 acres</u>	<u>1 CFS</u>
	6.3 acres	3 CFS

$$\text{Culvert } Q = 2.581 \left( \frac{d}{12} \right)^{2.5} = 14.60 \text{ CFS}$$

24 inch culvert is adequate to pass runoff. Sub-area 5 constitutes the revegetated area which affords protection by a series of four gabions and controlled with culvert C-3.

Sub-area 5	1.8 acres	1.0 CFS
------------	-----------	---------

$$\text{Culvert } Q = 2.581 \left( \frac{d}{12} \right)^{2.5} = 14.60 \text{ CFS}$$

24 inch culvert is adequate to pass runoff.

Runoff waters above the planned disturbance will be intercepted by two ditches: (1) an existing three foot wide by 600 feet long contour ditch constructed as part of the exploration plan; (2) a second ditch located on the uphill or cut section of the existing access road will intercept and convey the undisturbed runoff waters through the project area to a culvert which diverts the water under the road and into Cottonwood Creek.

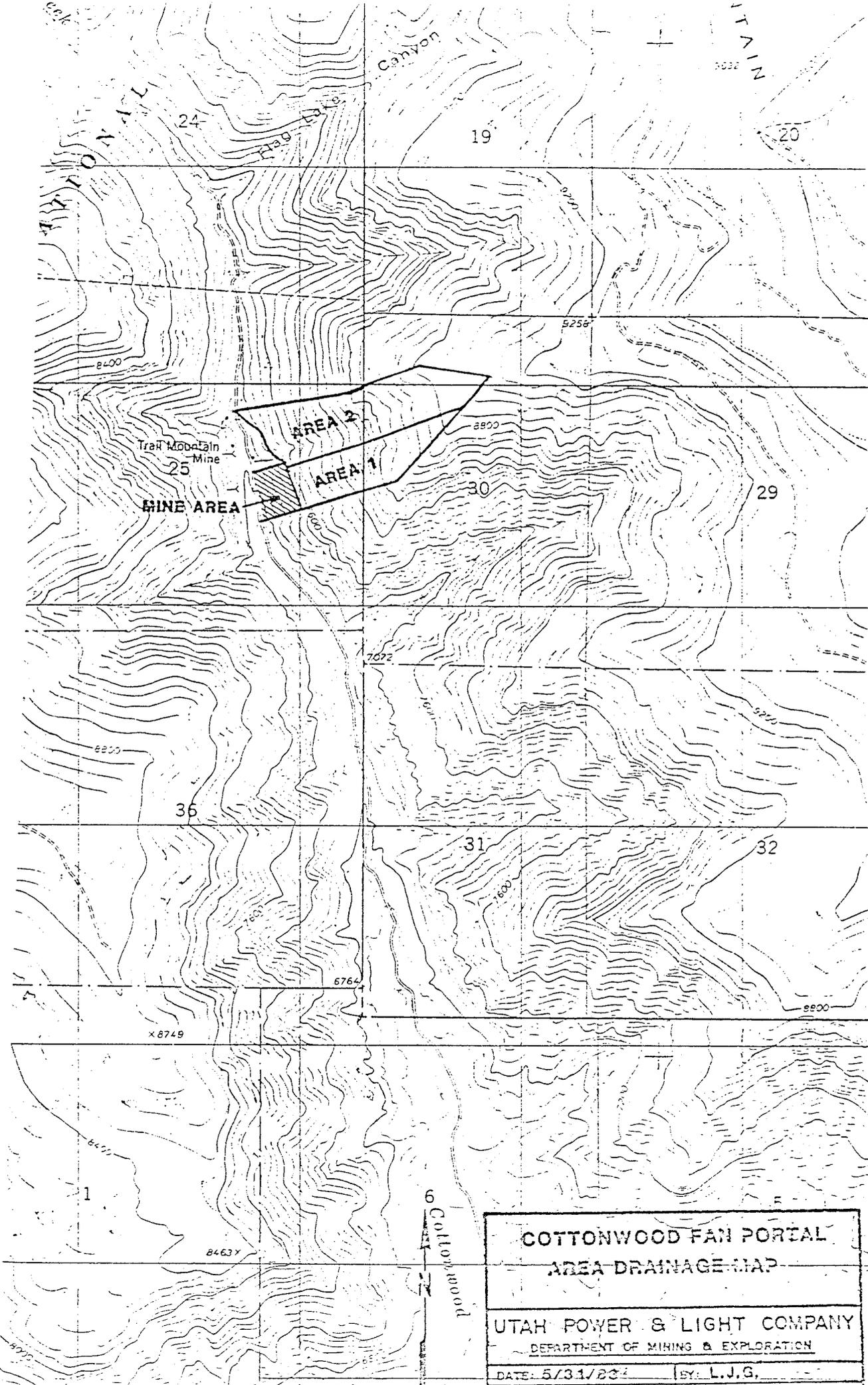
Ditch one diverts approximately thirty (30) acres and ditch two diverts almost sixty-two (62) acres.

Disturbed runoff from the Fan Portal is controlled by open ditch and will connect with another road collection system located on the cut side of the access road between survey stations 8 + 50 and 12 + 00 towards the middle, 10 + 50 where a culvert will convey the storm runoff under the road and down hill over slick rock outcrops to a constructed channel which empties into a sedimentation pond.

This collection system and sedimentation pond provides for the hydrological protection of the present and proposed Fan Portal site, acreage, 4.3 acres.

Runoff from the subsoil and topsoil storage piles are channelled by a ditch located on the east side of the county road to a small sedimentation pond located about two hundred (200) feet below the topsoil storage pile.

Runoff waters from the storage piles and county road drainage are divided by the inward super or slope of the road (see road details).



**COTTONWOOD FAN POREAL  
AREA DRAINAGE MAP**

**UTAH POWER & LIGHT COMPANY**  
DEPARTMENT OF MINING & EXPLORATION

DATE: 5/31/2024 BY: L.J.G.

Discharges from the two sedimentation ponds are also channelled by road side ditching to a 24 inch culvert located at road station 155+30.

Revegetation of the 1.3 acre outslope has recently been monitored and a report is included in the vegetation section.

Peak discharges from sub-areas of project area.

Area 1	30	Acres	U.S.G.S.	--	11 CFS
Area 2	65	Acres	U.S.G.S.	--	26 CFS
Area 3	2	Acres	CM-10501-CP	--	1 CFS
Area 4	2	Acres	CM-10501-CP	--	1 CFS
Area 5	1.8	Acres	CM-10501-CP	--	1 CFS
Area 6 and 7	.5	Acre	CM-10501-CP	--	1 CFS

Area 1 is diverted by a 600 foot long ditch whose configuration is two feet deep and outslped at 2:1 slope. Gradient varies from 5% on the north to 20% on the south where the ditch discharges. During the operational phase of mining this ditch will serve as a diversion for undisturbed runoff storm water above the Cottonwood fan portal. The ditch is sufficient in size to carry the anticipated peak flow of a 10-year, 24-hour storm event (approximately 11 cfs), using Manning's equation for bare soils .023 and an average 10% grade, a small ditch two feet wide and 2:1 side slopes will carry 15 cfs.

Although a channel lining of rock or vegetation is preferable, no protection is provided. Constructed in 1979, this diversion has handled the runoff waters to date with no visible effects or erosion. To access this small ditch

would require a major disturbance in an area not covered in the application (see Page 4-4-A).

Applicant will monitor the diversion and its outfall during the operation phase of mining. Reclamation will require some hand-work to allow surface runoff waters to flow as before mining.

### Diversions

Storm runoff from the largest area (65 acres) will be handled by a ditch constructed on the cut side of the reconstructed access road.

Present storm runoff has established small channels parallel to each other which intercept the road (old Johnson Mine access), and thence follow the road to the creek.

We plan to construct a trapezoidal ditch, two feet wide and two feet deep with 2:1 side slopes and riprapped with rock. See Drawing CM-10322-CP for details.

Using Manning's equation:  $Q = \frac{1.49}{R} AR^{2/3} S^{1/2}$   
the ditch would hold the 26 C+S runoff with sufficient free board.

These undisturbed waters will be diverted by a 36" culvert under the county road, as shown on Drawing CM-10501-CP.

Storm waters from the area immediately below the highest diversion ditch area 3 would flow downhill until intercepted with the fan portal access road, where a small ditch constructed on the uphill side of the new road would

collect the runoff from the approximately two acres above the road.

Peak runoff for the 10-year, 24-hour storm event would produce less than 2 cfs runoff, which can be handled by a small "V" ditch two feet wide, one foot deep.

Routing of this ditch discharges through a 15 inch culvert under the access road and into the main sedimentation pond for the disturbed area.

Two soil storage piles are placed adjacent to the county road runoff and sedimentation control is accomplished by small open ditches that flow into a small sedimentation pond. Pond sizes and dimensions are shown on included drawings.

The area below the old Johnson Mine access road is not planned for disturbance, and does not require sedimentation control. Methodology and calculations are in appendix.

**RECEIVED**  
JUL 16 1986

DIVISION OF  
OIL, GAS & MINING

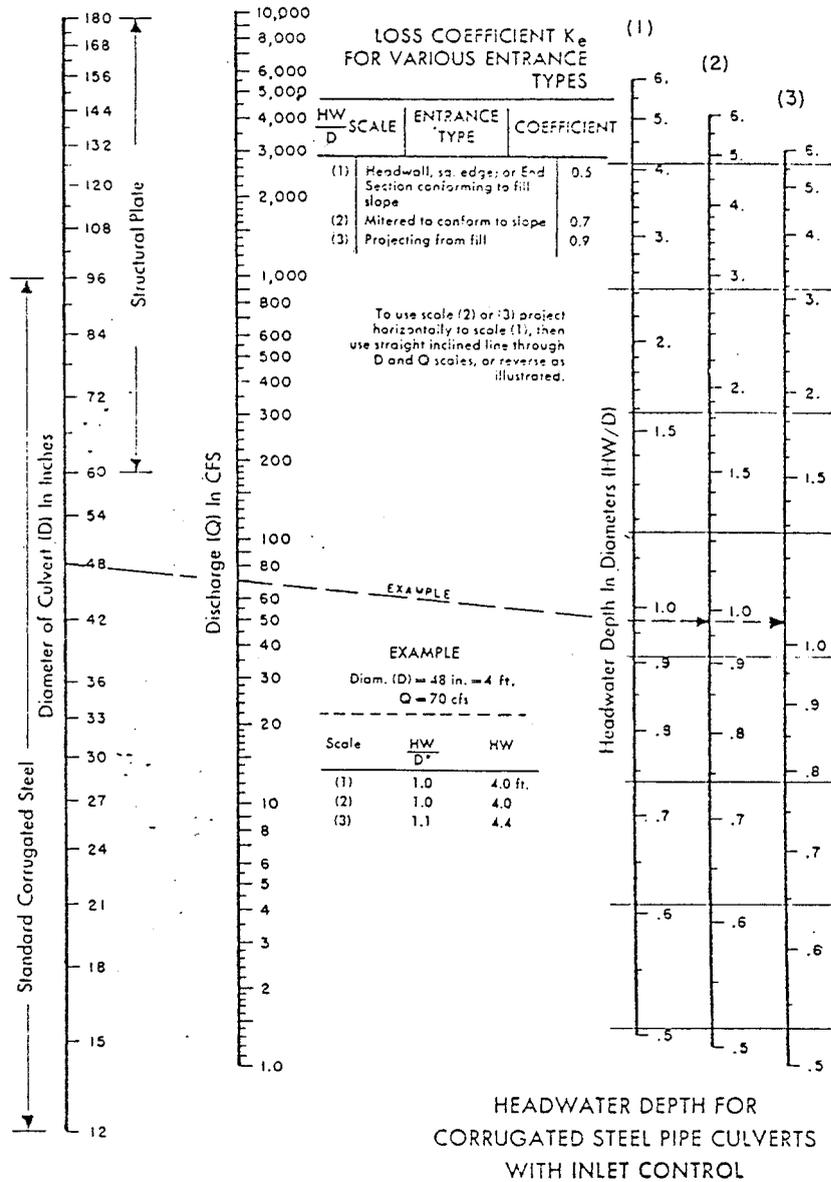
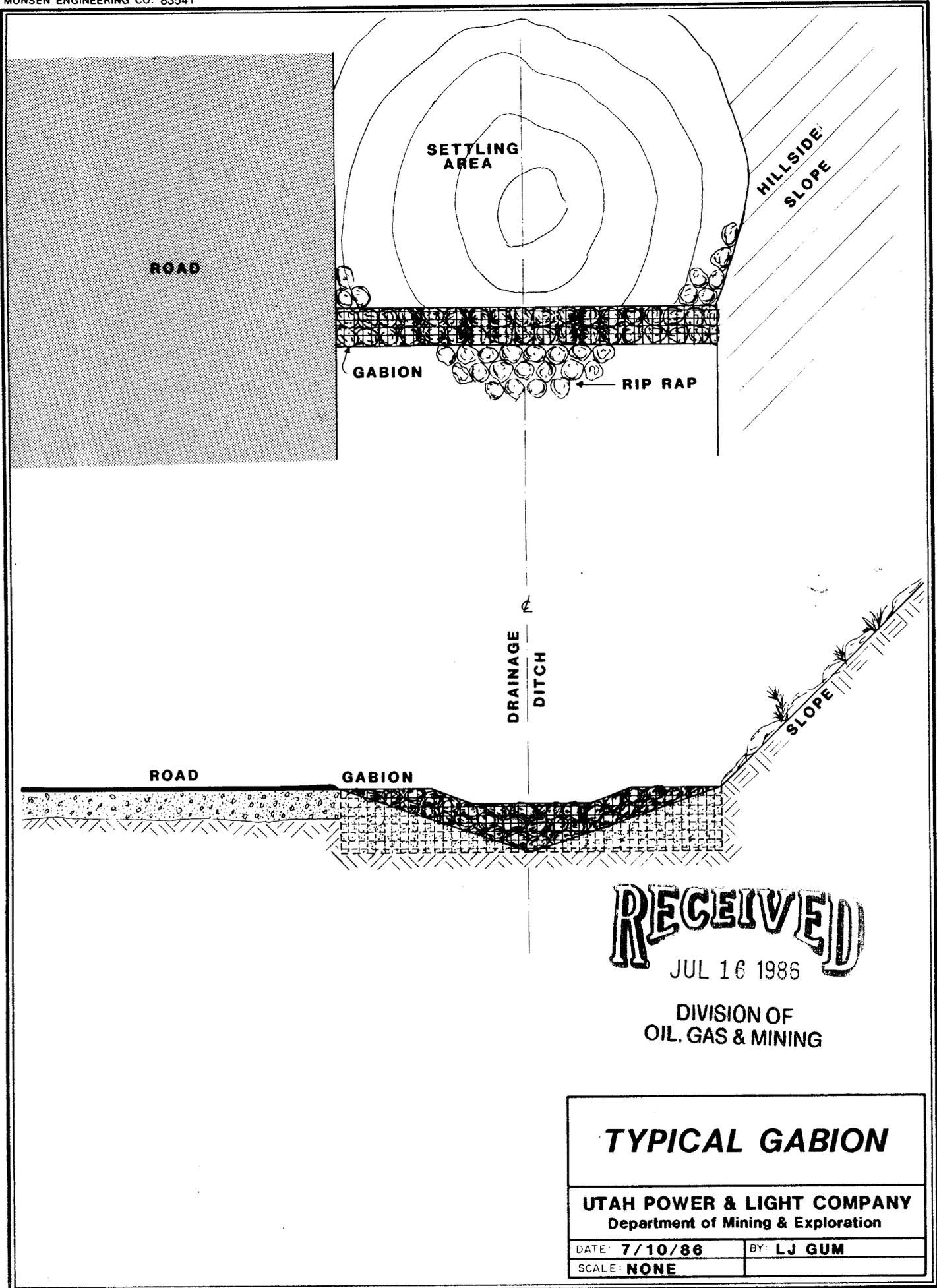


Fig. 4-18. Inlet control nomograph for corrugated steel pipe culverts. The manufacturers recommend keeping  $HW/D$  to a maximum of 1.5 and preferably to no more than 1.0.



**RECEIVED**  
JUL 16 1986

DIVISION OF  
OIL, GAS & MINING

**TYPICAL GABION**

UTAH POWER & LIGHT COMPANY  
Department of Mining & Exploration

DATE: 7/10/86

BY: LJ GUM

SCALE: NONE