Appendix C
Devil's Slide Construction Water Irrigation Dispersal Plan

The irrigation system for the entire 14.2 acre site will consist of approximately 1,500 ft of 3 in aluminum latch pipe main, 5,000 ft of 2 in laterals and 100 valves and 10 impact sprinkler heads and risers. A 7.5 hp pump will be needed to pressurize the system and isolation valves will be required. Flow through the system will be 50 to 100 gpm. Estimated costs, provided in Section 7.0 are for the entire irrigation system. The breakdown for these estimated costs are shown below.

Cost Breakdown for Irrigation System

System size (Ac)	Lateral cost ($)	Main cost ($)	Valve cost & swing joint (number) ($)	Sprinkler, riser & (number) ($)	Pump & motor ($)	Misc ($)	Total ($)
14.2	8,000	5,400	2,700 (100)	1,000 (10)	4,100	4,000	25,280

DEVIL'S SLIDE

CONSTRUCTION WATER IRRIGATION DISPERSAL PLAN

By

RONALD W. ALBERS
ALBERS & ASSOCIATES
14 October 2005

The foundation basis for the Irrigation Disposal plan to dispose of steady state water inflow to the tunnel bores used in this report are the assumptions and data contained in the ILF "Geotechnical Baseline Report", August 15, 2005 and the ILF "Geohydrologic Study" of 22 December 2004. Data from the "Construction Water Inflow" draft graph dated 13 October 2005 showing estimated steady state water inflows and estimated construction time has also been used in the projections.

Tunnel outflow water is to be disposed of via a combination of Irrigation, Construction water use and Ocean disposal.

This document addresses itself to the feasibility of water dispersal via irrigation. The area immediately available for irrigation use is 7.0 acres (site "A"). This area will grow to 14.2 acres over the projected nineteen month construction period. An additional 1.01 acres (site "B") is also available for water disposal through irrigation. Total site area available for irrigation water disposal is 15.2 acres. A beginning area of 8.0 acres (site A+B) is used in examining the feasibility of irrigation disposal.

Using the Construction Water Inflow projection as a base, the projected tunnel flow over the nineteen (19) month period is 420.2 million gallon. This equates to 1,290 Acre-Feet (A/F) of water over the 15.2 acres disposal site. In addition to the steady state construction flows, according the ILF study annual rainfall at the 15.2 acre site is predicted at 30" to 36" annually. The rainfall equates to an additional 12.4 million to 14.9 million gallons (38.0 to 45.6 A/F) that will be encountered during each rainy season encompassed during the construction period.

Rainfall is mentioned in that there will be little if any evapatransportation water loss during the period. Water loss during any period through evapatransportation should not be considered as a viable and constant source of loss. This is due to the rates of application, slope of the area, humidity and other variables.

Graph No. 1 shows the growth of the available land area over the nineteen month construction period (assumes a steady excavation rate) versus the tunnel steady state water inflow/outflow expressed in Acre Feet (A/F) applied per available acre each 30-day period. The peak period shown during months 12-13-14 represent the 50 l/s or 800 GPM anticipated worse case referred to in the ILS study.

CONCLUSIONS:

Water may be disposed of using irrigation. However, as seen in graph No.1 and stated herein the quantities of water are too large to apply over the designated area on a 24/7/365 basis. It is estimated that between 10% and 15% of the total waters produced may be disposed of over the area via irrigation on a 24/7/365 basis. The exact amount of water safely disposed of by irrigation is difficult to predict due to seasonal weather, soils, construction and other site variables unknown until construction begins.

A temporary and moveable irrigation system consisting of aluminum latch pipe and rotating sprinkler nozzles is to be employed. The contractor can move, expand and change this type system to meet the site condition. Water source will be from the Water Treatment System, after treatment.

Respectfully submitted,

Ronald W. Albers

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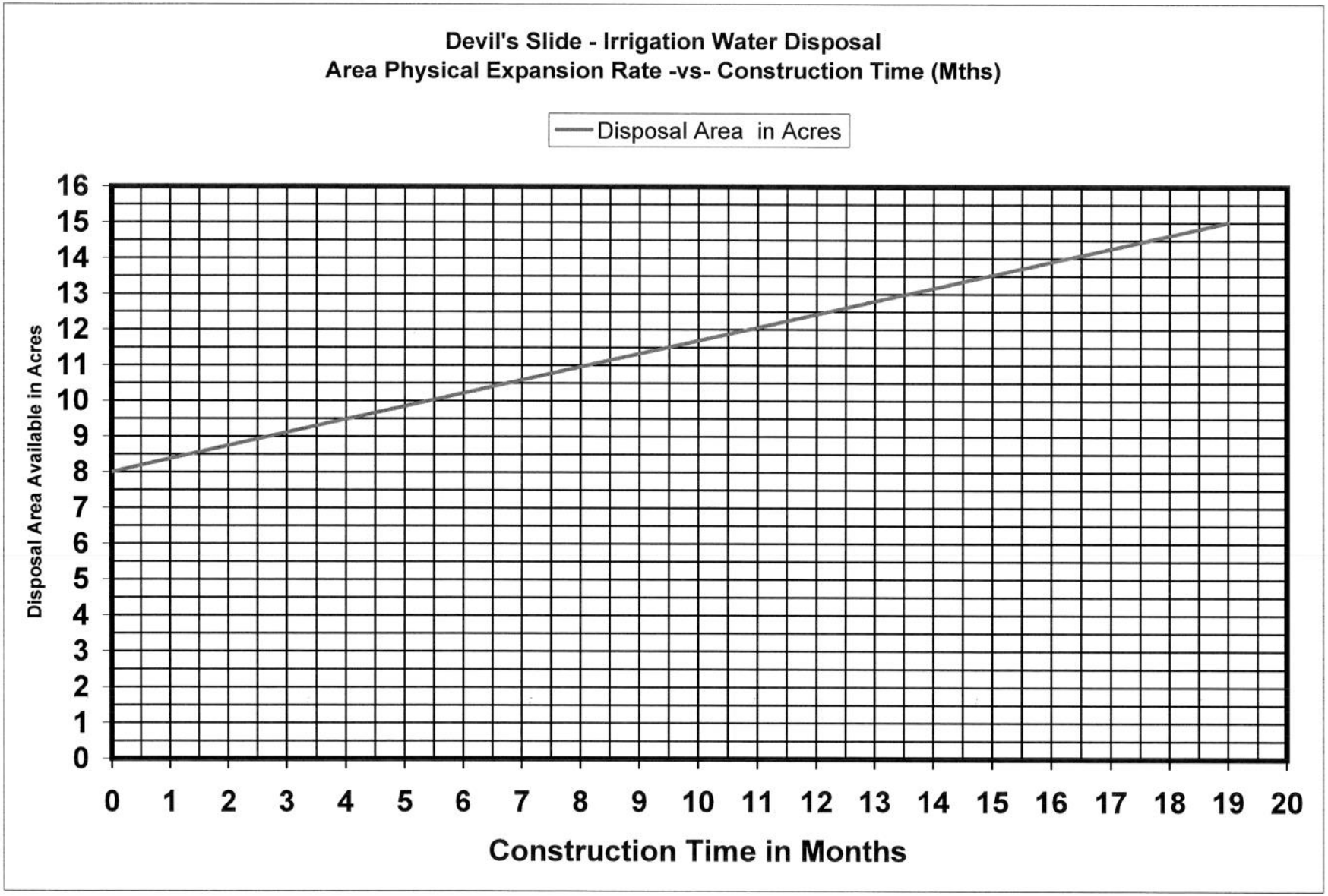
Attachments: Graph No. 1

F:\Devil's Slide Irrigation Plan

GRAPH NO.-1


Devil's Slide - Irrigation Water Disposal
Area Physical Expansion Rate -vs- Construction Time (Mths)
Disposal Area in Acres
Disposal Area Available in Acres
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Construction Time in Months