

**PERMIT TRACKING FORM**

Permit Amendment    Exploration Permit    NOV Abatement    Division Order    Permit Transfer    Incidental Boundary Change  
 Permit Midterm (MT)    Permit Renewal (PR)    New Permit    Significant Revision    Bond Release

Date Received: 8/7	By: tam	PERMIT NUMBER	PRO/007/039
Title of Proposal: New temp waste rock		PERMIT CHANGE #	98C
Description: Storage Area		PERMITTEE	Canyon Fuel Company, LLC
# Copies Required: 3	# Copies Received: 5	MINE NAME	Dugout Canyon Mine

**PERMIT CHANGE APPLICATION SENT TO SLC**   Date: \_\_\_\_\_   Letter to Permittee: \_\_\_\_\_

**15 DAY INITIAL RESPONSE TO PERMIT CHANGE APPLICATION OR INITIAL COMPLETENESS REVIEW**

Date Due:	Date Done:	Letter to Permittee:
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**Notice of Affidavit of Publication. (If change is a Significant Revision, New Permit, or Permit Transfer.)**

Date Due:	Date Done:	Public Comment Received:
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PFO Review Tracking	Round		Round		SLC Review Tracking	Round		Round	
	Due	Done	Due	Done		Due	Done	Due	Done
<input type="checkbox"/> Lead <input type="checkbox"/> Generalist					<input type="checkbox"/> Lead <input type="checkbox"/> Generalist				
<input type="checkbox"/> Administrative					<input type="checkbox"/> Administrative				
<input type="checkbox"/> Land Use/ AQ					<input type="checkbox"/> Land Use/ AQ				
<input type="checkbox"/> Biology					<input type="checkbox"/> Biology				
<input type="checkbox"/> Engineering <i>SB 8/21</i>					<input checked="" type="checkbox"/> Engineering <i>W/AM 8/21</i>				
<input type="checkbox"/> Geology					<input type="checkbox"/> Geology				
<input type="checkbox"/> Soils <i>RUB 8/21</i>					<input type="checkbox"/> Soils <i>RUB 8/21</i>				
<input type="checkbox"/> Hydrology					<input type="checkbox"/> Hydrology				

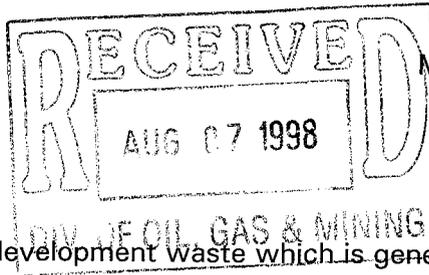
TA Review Due:	Date:	Permittee Response Due: <input type="checkbox"/> Stipulation <input type="checkbox"/> Condition <input type="checkbox"/> No Requirements	Date:	Division Decision Letter: <input type="checkbox"/> Approve <input type="checkbox"/> Deny
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TA Review Done	Date:	Response Received:	Date:	Date:
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Coordinated Reviews:	Phone Cont.	Round		Round		Received:	Additional Tracking:	Date:
		Sent	Due	Sent	Due			
<input type="checkbox"/> OSM- C							Public Hearing	
<input type="checkbox"/> Water Rights-L							Letter from Comp. Super.	
<input type="checkbox"/> DEQ- L							AVS Completed	
<input type="checkbox"/> DWR- L							Approval Effective Date	
<input type="checkbox"/> SITLA- L							Approved Copy to File	

Comments:

Approve copy to Permittee	
Approve copy to PFO/SLC	
Approved copy to agencies	
CHIA Modified	
Update master TA   Y/N	



**Surface Facilities.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- At the approved waste-rock disposal facility at the SUFCo Mine (a sister operation of SCM); or
- At the approved waste-rock disposal facility at the Skyline Mine (also a sister operation of SCM); or
- **At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.**

Copies of the Division correspondence approving the SUFCo and Skyline waste-rock disposal facilities for receipt of Dugout Canyon waste rock are provided in Appendix 5-2.

Certified maps and cross sections concerning the disposal of underground development waste at the SUFCo and Skyline Mines are provided in the respective Mining and Reclamation Plans (M&RPs) for those mines. A certified map showing the proposed location of non-coal (non-waste rock) waste storage, coal storage and loading areas, and explosive storage and handling facilities, is provided as Plate 5-2A. Cross sections of the proposed facilities area are provided on Plate 5-2B. *A location map, cross section, material description, volume calculation, and slope stability analysis for a temporary waste rock storage area to be utilized during site construction is included in Appendix 5-7.*

A map of the existing topography prior to disturbance by SCM is provided as Plate 5-2C. Also noted on Plate 5-2C is the area of disturbance which was mapped to exist at the site in 1980. Since mining ceased at the site in 1964 (as noted earlier in this section), this boundary represents the area of pre-SMCRA disturbance. Plate 5-2C also shows areas of non-mining disturbance which occurred after 1980 but prior to 1996. These disturbances were created by logging activities in the area and are not subject to the requirements of R645-301 through R645-302. No areas shown on Plate 5-2C are subject to the requirements of R645-200 through R645-203.

A certified map showing the location of the topsoil stockpile is provided as Plate 2-3.

The proposed location of the sedimentation pond is noted on Plate 5-2A. No water treatment facilities will exist at the site other than the sewage leach field and the sedimentation pond.

The following facilities or activities will not exist or occur within the permit area:

- Coal preparation plant,
- Coal cleaning,
- Coal processing waste banks, dams, or embankments,
- Disposal of non-coal (non-waste rock) waste other than durable rock-type construction materials such as cinder block, and
- Air pollution control facilities.

Hence, certified maps or cross sections of these facilities are not provided in this plan. The durable rock-type construction materials will be disposed of in locations designated to receive underground development waste (i.e., at the approved waste-rock disposal facilities. ~~associated with the SUFCo or Skyline Mines~~).

**Surface Configurations.** Certified maps and cross sections showing the proposed final (post-reclamation) surface configuration of the Dugout Canyon disturbed area are provided on Plates 5-3 and 5-4.

**Hydrology.** Certified maps and cross sections associated with the hydrology of the Dugout Canyon Mine area are provided in Chapter 7.

**Geology.** Certified maps and cross sections associated with the geology of the Dugout Canyon Mine area are provided in Chapter 6.

### **513 Compliance with MSHA Regulations and MSHA Approvals**

#### **513.100 Coal Processing Waste Dams and Embankments**

No coal processing waste dams or embankments will exist within the permit area.

#### **513.200 Impoundments and Sedimentation Ponds**

No impoundments or sedimentation ponds in the permit area will meet the size criteria of 30 CFR 77.216(a).

#### **513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil**

No coal processing waste or excess spoil will be generated within the permit area. It is not anticipated that underground development waste will be disposed of in underground mine workings.

#### **513.400 Refuse Piles**

Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A *and the map in Appendix 5-7*. This storage will be for a short period of time prior to ultimate disposal in the waste-rock disposal areas associated with the SUFCo, Skyline Mines **and/or other permitted and approved sites**. Waste rock ***not used as fill material*** will be disposed of after ~~a truck load~~ *approximately 1500 CY* of material accumulates or every ~~34~~ months, whichever is shorter. Runoff from the stored materials will drain to the site sedimentation pond *or appropriate sediment control structures*.

### **513 Compliance with MSHA Regulations and MSHA Approvals**

#### **513.100 Coal Processing Waste Dams and Embankments**

No coal processing waste dams or embankments will exist within the permit area.

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#### **513.400 Refuse Piles**

Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A *and the map in Appendix 5-7*. This storage will be for a short period of time prior to ultimate disposal in the waste-rock disposal areas associated with the SUFCo, Skyline Mines **and/or other permitted and approved sites**. Waste rock ***not used as fill material*** will be disposed of after ~~a truck load~~ *approximately 1500 CY* of material accumulates or every ~~34~~ months, whichever is shorter. Runoff from the stored materials will drain to the site sedimentation pond *or appropriate sediment control structures*.

of this M&RP). No burning mine waste will be removed from the temporary storage area without a removal plan approved by the Division.

## **514 Inspections**

### **514.100 Excess Spoil**

Excess spoil will not be generated at the Dugout Canyon Mine.

### **514.200 Refuse Piles**

The frequency and methods of inspections of the waste-rock areas at the SUFCo and Skyline Mines is discussed in their respective M&RPs. Quarterly inspections will be made of the temporary waste-rock storage area at the mine site (see Plate 5-2A). These inspections will be performed by a professional engineer or a specialist experienced in the construction of similar earth and waste structures. The inspector will provide a certified report to the Division within two weeks after each inspection. The report will discuss any appearances of instability, structural weakness, or other hazardous conditions. A copy of this report will also be maintained at the mine site.

~~An MSHA permit will be obtained before any waste rock is placed in the temporary storage area.~~ All activities performed at this area will be in accordance with the applicable MSHA permit.

### **514.300 Impoundments**

Regular inspections will be made during construction of the sedimentation pond and other impoundments as well as upon completion of construction. These inspections will be made

Plates 4-1 and 5-2A depict the location of an existing UP&L distribution line that will be improved and activated to provide electrical service to the mine. This distribution line, which is not classified as a major electric transmission line, will be owned and upgraded by UP&L.

As noted previously, waste rock which is generated at the Dugout Canyon Mine will be disposed of in the approved waste-rock disposal areas at the SUFCo and/or Skyline Mines.-  
~~**However, if the material is found to be non-toxic or acid-forming, it may be used as fill during site construction.**~~ The location of the sedimentation pond within the permit area is shown on Plate 5-2A. There will be no permanent water impoundments within the permit area.

**Landowner, Right-of-Entry, and Public Interest.** Figures 1-1 and 1-2 of Chapter 1 show the boundaries of lands and the names of present owners of record of surface lands and subsurface coal, respectively, included in or contiguous to the permit area. CFC has a legal right to enter and begin coal mining operations on all of the lands within the permit area, as noted in Chapter 1, Section 114 of this M&RP.

Coal mining and reclamation operations will be conducted within 100 feet of the right-of-way line of a public road (an as-yet unnumbered Carbon County road) only where the mine facilities road joins that right-of-way (i.e. at the downstream edge of the disturbed-area boundary).

As noted in Section 534.300, selection of the final alignment of the reconstructed county road will be the responsibility of Carbon County. It is anticipated that the county road will not be significantly realigned within the permit area. During mining and reclamation operations, this road will be used for mine access and coal haulage.

All roads upstream from the sedimentation pond are private roads.

Subsidence from underground mining operations is not projected to affect public lands where dirt roads exist within the permit and adjacent areas (see Section 525.100 of this M&RP).

### 528.200 Overburden

No overburden will be removed, handled, stored, or transported within the permit area.

### 528.300 Spoil, Coal Processing Waste, Non-Coal Waste, and Mine Development Waste

**Excess Spoil.** No spoil will be generated at the Dugout Canyon Mine. Sediment removed from the sedimentation pond will be handled in accordance with Section 732.200 of this M&RP.

**Coal Processing Waste.** SCM will not process their coal at the Dugout Canyon Mine beyond crushing and screening. Thus, no coal processing waste will be generated in the permit area.

**Burning and Burned Waste Utilization.** As noted below and in Section 536 of this M&RP, waste rock generated from the Dugout Canyon Mine will be permanently disposed of at permitted facilities located at the SUFCo, Skyline Mines, ~~or other permitted waste rock disposal sites provided the M&RP for those sites will allow for disposal of Dugout Canyon Mine waste rock. , or if suitable, used as fill material during site construction.~~ If coal mine waste fires occur ~~at the permitted disposal sites, SUFCo and Skyline Mines,~~ they will be controlled in the manner outlined in their respective permits.

Waste rock will only be temporarily stored at the surface of the Dugout Canyon Mine prior to ultimate disposal ~~or use~~. If spontaneous combustion of this material does occur, the burning section will be removed from the remainder of the pile using a backhoe or other appropriate means. The affected waste rock will then be spread so that the material can cool and mixed with soil to extinguish the fire. The extinguished material will then be returned to the waste pile.

**Non-Coal Mine Waste.** Non-coal (non-waste rock) waste generated in the permit area will be temporarily stored in a dumpster to be situated at a convenient location within the disturbed area. This dumpster will be located adjacent to the trailers shown on Plate 5-2A northeast of the coal pile. This waste will be disposed of periodically through Carbon County at a permitted landfill.

Liquid wastes such as oil and solvents will be contained and disposed of or recycled, in accordance with applicable State and Federal regulations, at facilities which are permitted to accept such wastes. Small quantities of such wastes (e.g., resulting from cleanup of small spills, etc.) may be contained onto absorbent pads prior to disposal. In all cases, disposal and/or recycling will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

No non-coal (non-waste rock) waste will be permanently disposed of within the permit area. Non-coal (non-waste rock) waste will be temporarily stored at the site prior to permanent off-site disposal either in a dumpster or in the temporary waste-rock storage area. Off-site disposal will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

It is currently anticipated that no non-coal waste that is defined as hazardous under 40 CFR 261 will be generated at the mine. If such waste is generated in the future, it will be handled in accordance with the requirements of Subtitle C of the Resource Conservation and Recovery Act and any implementing regulations.

**Underground Development Waste.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- At the approved water-rock disposal facility at the SUFCo Mine; ~~or~~
- At the approved waste-rock disposal facility at the Skyline Mine;
- **At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.**

**Road Maintenance.** The county road will be maintained by Carbon County.

**Road Culverts.** All culverts along the county road will be designed, installed, and maintained by Carbon County. Culverts to be installed within the surface facilities have been designed in accordance with the hydrologic criteria discussed in Section 742.300. These culverts will be installed in accordance with manufacturer's recommendations to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

### **535 Spoil**

No spoil will be generated in the permit area. No valley fills or head-of-hollow fills will be created for the disposal of spoil material. Furthermore, no excess spoil will be disposed of in pre-existing benches.

### **536 Coal Mine Waste**

Coal mine waste resulting from mining activities at the Dugout Canyon Mine will be disposed of at an approved waste-rock disposal facilities such as those operated at the SUFCo Mine or at the Skyline Mine. Both of these are sister operations of SCM. Descriptions of the aforementioned waste-rock disposal facilities are presented in the respective M&RPs.

The coal mine waste generated from the Dugout Canyon Mine may be temporarily stored on the surface of the Dugout Canyon Mine facilities at the location shown on Plate 5-2A prior to ultimate disposal. Coal mine waste which is stored at the mine site will be removed from the temporary waste-rock storage area and placed in its final disposal area at the frequency noted in Section 513.400 of this M&RP. Runoff from the temporary waste-rock storage area will report to the mine-site sedimentation pond and be treated accordingly. During the period of temporary storage, berms will be installed around the temporary storage area to contain and direct runoff to ditch DD-2a (see Plate 7-5). The berms around the temporary waste-rock

storage area are not noted on Plate 7-5 or elsewhere since these will be located as necessary, depending upon the extent of the waste-rock storage.

### **536.100 Design**

The waste-rock disposal facilities at the SUFCo Mine and Skyline Mine were designed to achieve minimum long-term static safety factors of at least 1.5. These designs and the associated evaluations were based on the results of detailed foundation and laboratory analyses of soils at the sites of the disposal facilities.

Due to the temporary nature of the waste-rock storage area shown on Plate 5-2A, the long-term static safety factor of this material has not been evaluated. Foundation conditions beneath the pad on which the waste rock will be temporarily stored are discussed in Chapter 2 and Appendix 5-4 of this M&RP.

### **536.200 Waste Emplacement**

Waste rock from the Dugout Canyon Mine that is to be hauled to the SUFCo, or Skyline Mine, ~~or other approved~~ disposal sites will be emplaced in accordance with the respective M&RPs. This waste will be placed in a controlled manner to ensure the mass stability of the waste piles and prevent mass movement during and after construction. The waste rock will be covered periodically to minimize public hazards and the potential for spontaneous combustion.

Waste rock will be emplaced in the temporary storage ~~area~~ areas at the Dugout Canyon Mine using front-end loaders and other appropriate earth-moving equipment. Due to the temporary nature of this storage, mass movement, public hazards, and spontaneous combustion of the material will not occur prior to its ultimate disposal.

### **536.300 Excess Spoil Fills**

No excess spoil fills will exist in the permit area.

### **536.400 Impounding Structures Constructed of Coal Mine Waste**

No impounding structures will be constructed of coal mine waste in the permit area.

### **536.500 Disposal of Coal Mine Waste in Special Areas**

Coal mine waste generated at the Dugout Canyon Mine will be disposed of at approved disposal sites such as ~~either the approved~~ SUFCo facility or the ~~approved~~ Skyline facility. Coal mine waste will not be permanently disposed of at the Dugout Canyon Mine.

### **536.600 Underground Development Waste**

A detailed description of the geotechnical investigations, design, construction, operation, maintenance, and reclamation of the waste-rock disposal sites at the SUFCo and Skyline Mines is provided in their respective M&RPs. These M&RPs also contain:

- Descriptions of pre-disturbance soil resources at the waste-rock disposal sites;
- Descriptions of plans for stockpiling topsoil at the waste-rock disposal sites; and
- Discussions of the suitability of the material for reclamation.

### **536.700 Coal Processing Waste**

No coal processing waste will be generated within the permit area.

### **536.800 Coal Processing Waste Banks, Dams, and Embankments**

No coal processing waste banks, dams, or embankments will exist within the permit area.

### **536.900 Refuse Piles**

A detailed description of the waste-rock disposal sites at the SUFCo, Skyline Mines, and other potential permitted disposal sites is provided in their respective M&RPs. These M&RPs provide:

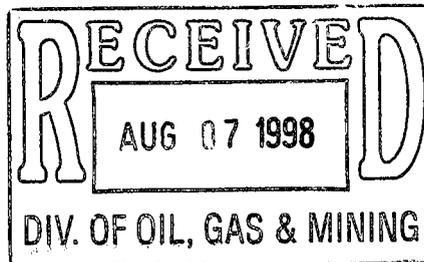
- A description of pre-disturbance soils at the sites;
- Certification of the design and plans;
- Compliance with applicable MSHA regulations;
- A description of proposed inspection activities;
- A description of the design, stability, operation, and reclamation of the waste-rock sites; and
- A discussion of runoff- and sediment-control plans associated with the sites.

The suitability of the waste rock to be generated from the Dugout Canyon Mine for reclamation is discussed in Chapters 2 and 6 of this M&RP.

With respect to the temporary waste-rock disposal area designated on Plate 5-2A, the following information can be found in the indicated sections of this M&RP:

- A description of pre-disturbance soils at the sites - Chapter 2
- A description of the suitability of the waste rock for reclamation - Chapters 2 and 6

Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

**Surface Facilities.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of :

- At the approved waste-rock disposal facility at the SUFCo Mine (a sister operation of SCM);
- At the approved waste-rock disposal facility at the Skyline Mine (also a sister operation of SCM); or
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

Copies of the Division correspondence approving the SUFCo and Skyline waste-rock disposal facilities for receipt of Dugout Canyon waste rock are provided in Appendix 5-2.

Certified maps and cross sections concerning the disposal of underground development waste at the SUFCo and Skyline Mines are provided in the respective Mining and Reclamation Plans (M&RPs) for those mines. A certified map showing the proposed location of non-coal (non-waste rock) waste storage, coal storage and loading areas, and explosive storage and handling facilities, is provided as Plate 5-2A. Cross sections of the proposed facilities area are provided on Plate 5-2B. A location map, cross section, material description, volume calculation, and slope stability analysis for a temporary waste rock storage area to be utilized during site construction is included in Appendix 5-7.

A map of the existing topography prior to disturbance by SCM is provided as Plate 5-2C. Also noted on Plate 5-2C is the area of disturbance which was mapped to exist at the site in 1980. Since mining ceased at the site in 1964 (as noted earlier in this section), this boundary represents the area of pre-SMCRA disturbance. Plate 5-2C also shows areas of non-mining disturbance which occurred after 1980 but prior to 1996. These disturbances were created by logging activities in the area and are not subject to the requirements of R645-301 through R645-302. No areas shown on Plate 5-2C are subject to the requirements of R645-200 through R645-203.

A certified map showing the location of the topsoil stockpile is provided as Plate 2-3.

The proposed location of the sedimentation pond is noted on Plate 5-2A. No water treatment facilities will exist at the site other than the sewage leach field and the sedimentation pond.

The following facilities or activities will not exist or occur within the permit area:

- Coal preparation plant,
- Coal cleaning,
- Coal processing waste banks, dams, or embankments,
- Disposal of non-coal (non-waste rock) waste other than durable rock-type construction materials such as cinder block, and
- Air pollution control facilities.

Hence, certified maps or cross sections of these facilities are not provided in this plan. The durable rock-type construction materials will be disposed of in locations designated to receive underground development waste (i.e., at the approved waste-rock disposal facilities).

**Surface Configurations.** Certified maps and cross sections showing the proposed final (post-reclamation) surface configuration of the Dugout Canyon disturbed area are provided on Plates 5-3 and 5-4.

**Hydrology.** Certified maps and cross sections associated with the hydrology of the Dugout Canyon Mine area are provided in Chapter 7.

**Geology.** Certified maps and cross sections associated with the geology of the Dugout Canyon Mine area are provided in Chapter 6.

### **513 Compliance with MSHA Regulations and MSHA Approvals**

#### **513.100 Coal Processing Waste Dams and Embankments**

No coal processing waste dams or embankments will exist within the permit area.

#### **513.200 Impoundments and Sedimentation Ponds**

No impoundments or sedimentation ponds in the permit area will meet the size criteria of 30 CFR 77.216(a).

#### **513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil**

No coal processing waste or excess spoil will be generated within the permit area. It is not anticipated that underground development waste will be disposed of in underground mine workings.

#### **513.400 Refuse Piles**

Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A and the map in Appendix 5-7. This storage will be for a short period of time prior to ultimate disposal in the waste-rock disposal areas associated with the SUFCo, Skyline Mines and/or other permitted and approved sites. Waste rock will be disposed of after approximately 1500 CY of material accumulates or every 4 months, whichever is shorter. Runoff from the stored materials will drain to the site sedimentation pond or appropriate sediment control structures.

### **513.500 Underground Openings to the Surface**

Upon abandonment, each opening to the surface from the underground will be capped, sealed, backfilled, or otherwise properly managed in accordance with 30 CFR 75.1771. Details regarding final abandonment of mine openings are provided in Section 542.700.

### **513.600 Discharges to Underground Mines**

No discharges will occur from the surface to underground mine workings in the permit area.

### **513.700 Surface Coal Mining and Reclamation Activities**

No surface coal mining and reclamation activities will occur in the permit area.

### **513.800 Coal Mine Waste Fires**

If any coal mine waste fires occur within the permit area, these will be reported immediately to MSHA and the Division. Immediate remedial action will be taken as deemed necessary by SCM to protect public health and safety as well as the environment. Following initial remedial efforts, a long-term plan will be formulated in discussion with MSHA and the Division to extinguish any existing fires and prevent future fires.

SCM will utilize a program of prevention and suppression to minimize the potential for coal mine waste fires. An ongoing educational program will emphasize the need for attention to fire prevention. Prevention will be further enhanced by the short-term nature of the storage at the Dugout Canyon Mine. Suppression will occur by separating smoldering material and compacting the adjacent material (to minimize oxygen content in the adjacent material). The burning material will then be extinguished using appropriate methods (see Section 528.300

of this M&RP). No burning mine waste will be removed from the temporary storage area without a removal plan approved by the Division.

## **514 Inspections**

### **514.100 Excess Spoil**

Excess spoil will not be generated at the Dugout Canyon Mine.

### **514.200 Refuse Piles**

The frequency and methods of inspections of the waste-rock areas at the SUFCo and Skyline Mines is discussed in their respective M&RPs. Quarterly inspections will be made of the temporary waste-rock storage area at the mine site (see Plate 5-2A). These inspections will be performed by a professional engineer or a specialist experienced in the construction of similar earth and waste structures. The inspector will provide a certified report to the Division within two weeks after each inspection. The report will discuss any appearances of instability, structural weakness, or other hazardous conditions. A copy of this report will also be maintained at the mine site.

All activities performed at this area will be in accordance with the applicable MSHA permit.

### **514.300 Impoundments**

Regular inspections will be made during construction of the sedimentation pond and other impoundments as well as upon completion of construction. These inspections will be made

Plates 4-1 and 5-2A depict the location of an existing UP&L distribution line that will be improved and activated to provide electrical service to the mine. This distribution line, which is not classified as a major electric transmission line, will be owned and upgraded by UP&L.

As noted previously, waste rock which is generated at the Dugout Canyon Mine will be disposed of in the approved waste-rock disposal areas at the SUFCo and/or Skyline Mines.

The location of the sedimentation pond within the permit area is shown on Plate 5-2A. There will be no permanent water impoundments within the permit area.

**Landowner, Right-of-Entry, and Public Interest.** Figures 1-1 and 1-2 of Chapter 1 show the boundaries of lands and the names of present owners of record of surface lands and subsurface coal, respectively, included in or contiguous to the permit area. CFC has a legal right to enter and begin coal mining operations on all of the lands within the permit area, as noted in Chapter 1, Section 114 of this M&RP.

Coal mining and reclamation operations will be conducted within 100 feet of the right-of-way line of a public road (an as-yet unnumbered Carbon County road) only where the mine facilities road joins that right-of-way (i.e. at the downstream edge of the disturbed-area boundary).

As noted in Section 534.300, selection of the final alignment of the reconstructed county road will be the responsibility of Carbon County. It is anticipated that the county road will not be significantly realigned within the permit area. During mining and reclamation operations, this road will be used for mine access and coal haulage.

All roads upstream from the sedimentation pond are private roads.

Subsidence from underground mining operations is not projected to affect public lands where dirt roads exist within the permit and adjacent areas (see Section 525.100 of this M&RP).

### **528.200 Overburden**

No overburden will be removed, handled, stored, or transported within the permit area.

### **528.300 Spoil, Coal Processing Waste, Non-Coal Waste, and Mine Development Waste**

**Excess Spoil.** No spoil will be generated at the Dugout Canyon Mine. Sediment removed from the sedimentation pond will be handled in accordance with Section 732.200 of this M&RP.

**Coal Processing Waste.** SCM will not process their coal at the Dugout Canyon Mine beyond crushing and screening. Thus, no coal processing waste will be generated in the permit area.

**Burning and Burned Waste Utilization.** As noted below and in Section 536 of this M&RP, waste rock generated from the Dugout Canyon Mine will be disposed of at permitted facilities located at the SUFCo, Skyline Mines, or other permitted waste rock disposal sites provided the M&RP for those sites will allow for disposal of Dugout Canyon Mine waste rock. If coal mine waste fires occur at the permitted disposal sites, they will be controlled in the manner outlined in their respective permits.

Waste rock will only be temporarily stored at the surface of the Dugout Canyon Mine prior to ultimate disposal or use. If spontaneous combustion of this material does occur, the burning section will be removed from the remainder of the pile using a backhoe or other appropriate means. The affected waste rock will then be spread so that the material can cool and mixed with soil to extinguish the fire. The extinguished material will then be returned to the waste pile.

**Non-Coal Mine Waste.** Non-coal (non-waste rock) waste generated in the permit area will be temporarily stored in a dumpster to be situated at a convenient location within the disturbed

area. This dumpster will be located adjacent to the trailers shown on Plate 5-2A northeast of the coal pile. This waste will be disposed of periodically through Carbon County at a permitted landfill.

Liquid wastes such as oil and solvents will be contained and disposed of or recycled, in accordance with applicable State and Federal regulations, at facilities which are permitted to accept such wastes. Small quantities of such wastes (e.g., resulting from cleanup of small spills, etc.) may be contained onto absorbent pads prior to disposal. In all cases, disposal and/or recycling will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

No non-coal (non-waste rock) waste will be permanently disposed of within the permit area. Non-coal (non-waste rock) waste will be temporarily stored at the site prior to permanent off-site disposal either in a dumpster or in the temporary waste-rock storage area. Off-site disposal will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

It is currently anticipated that no non-coal waste that is defined as hazardous under 40 CFR 261 will be generated at the mine. If such waste is generated in the future, it will be handled in accordance with the requirements of Subtitle C of the Resource Conservation and Recovery Act and any implementing regulations.

**Underground Development Waste.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- At the approved water-rock disposal facility at the SUFCo Mine;
- At the approved waste-rock disposal facility at the Skyline Mine;
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

**Road Maintenance.** The county road will be maintained by Carbon County.

**Road Culverts.** All culverts along the county road will be designed, installed, and maintained by Carbon County. Culverts to be installed within the surface facilities have been designed in accordance with the hydrologic criteria discussed in Section 742.300. These culverts will be installed in accordance with manufacturer's recommendations to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

### **535 Spoil**

No spoil will be generated in the permit area. No valley fills or head-of-hollow fills will be created for the disposal of spoil material. Furthermore, no excess spoil will be disposed of in pre-existing benches.

### **536 Coal Mine Waste**

Coal mine waste resulting from mining activities at the Dugout Canyon Mine will be disposed of at an approved waste-rock disposal facilities such as those operated at the SUFCo Mine or at the Skyline Mine. Both of these are sister operations of SCM. Descriptions of the aforementioned waste-rock disposal facilities are presented in the respective M&RPs.

The coal mine waste generated from the Dugout Canyon Mine may be temporarily stored on the surface of the Dugout Canyon Mine facilities at the location shown on Plate 5-2A prior to ultimate disposal. Coal mine waste which is stored at the mine site will be removed from the temporary waste-rock storage area and placed in its final disposal area at the frequency noted in Section 513.400 of this M&RP. Runoff from the temporary waste-rock storage area will report to the mine-site sedimentation pond and be treated accordingly. During the period of temporary storage, berms will be installed around the temporary storage area to contain and direct runoff to ditch DD-2a (see Plate 7-5). The berms around the temporary waste-rock

storage area are not noted on Plate 7-5 or elsewhere since these will be located as necessary, depending upon the extent of the waste-rock storage.

### **536.100 Design**

The waste-rock disposal facilities at the SUFCo Mine and Skyline Mine were designed to achieve minimum long-term static safety factors of at least 1.5. These designs and the associated evaluations were based on the results of detailed foundation and laboratory analyses of soils at the sites of the disposal facilities.

Due to the temporary nature of the waste-rock storage area shown on Plate 5-2A, the long-term static safety factor of this material has not been evaluated. Foundation conditions beneath the pad on which the waste rock will be temporarily stored are discussed in Chapter 2 and Appendix 5-4 of this M&RP.

### **536.200 Waste Emplacement**

Waste rock from the Dugout Canyon Mine that is to be hauled to the SUFCo, Skyline Mine, or other approved disposal sites will be emplaced in accordance with the respective M&RPs. This waste will be placed in a controlled manner to ensure the mass stability of the waste piles and prevent mass movement during and after construction. The waste rock will be covered periodically to minimize public hazards and the potential for spontaneous combustion.

Waste rock will be emplaced in the temporary storage *areas* at the Dugout Canyon Mine using front-end loaders and other appropriate earth-moving equipment. Due to the temporary nature of this storage, mass movement, public hazards, and spontaneous combustion of the material will not occur prior to its ultimate disposal.

### **536.800 Coal Processing Waste Banks, Dams, and Embankments**

No coal processing waste banks, dams, or embankments will exist within the permit area.

### **536.900 Refuse Piles**

A detailed description of the waste-rock disposal sites at the SUFCo, Skyline Mines, and other potential permitted disposal sites is provided in their respective M&RPs. These M&RPs provide:

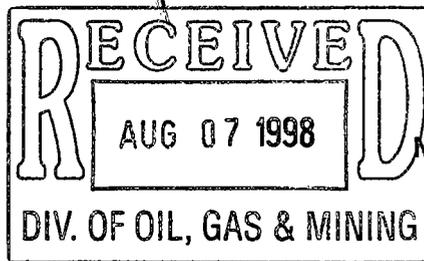
- A description of pre-disturbance soils at the sites;
- Certification of the design and plans;
- Compliance with applicable MSHA regulations;
- A description of proposed inspection activities;
- A description of the design, stability, operation, and reclamation of the waste-rock sites; and
- A discussion of runoff- and sediment-control plans associated with the sites.

The suitability of the waste rock to be generated from the Dugout Canyon Mine for reclamation is discussed in Chapters 2 and 6 of this M&RP.

With respect to the temporary waste-rock disposal area designated on Plate 5-2A, the following information can be found in the indicated sections of this M&RP:

- A description of pre-disturbance soils at the sites - Chapter 2
- A description of the suitability of the waste rock for reclamation - Chapters 2 and 6
- Certification of the design and plans - Section 512

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**Surface Facilities.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of :

- At the approved waste-rock disposal facility at the SUFCo Mine (a sister operation of SCM);
- At the approved waste-rock disposal facility at the Skyline Mine (also a sister operation of SCM); or
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

Copies of the Division correspondence approving the SUFCo and Skyline waste-rock disposal facilities for receipt of Dugout Canyon waste rock are provided in Appendix 5-2.

Certified maps and cross sections concerning the disposal of underground development waste at the SUFCo and Skyline Mines are provided in the respective Mining and Reclamation Plans (M&RPs) for those mines. A certified map showing the proposed location of non-coal (non-waste rock) waste storage, coal storage and loading areas, and explosive storage and handling facilities, is provided as Plate 5-2A. Cross sections of the proposed facilities area are provided on Plate 5-2B. A location map, cross section, material description, volume calculation, and slope stability analysis for a temporary waste rock storage area to be utilized during site construction is included in Appendix 5-7.

A map of the existing topography prior to disturbance by SCM is provided as Plate 5-2C. Also noted on Plate 5-2C is the area of disturbance which was mapped to exist at the site in 1980. Since mining ceased at the site in 1964 (as noted earlier in this section), this boundary represents the area of pre-SMCRA disturbance. Plate 5-2C also shows areas of non-mining disturbance which occurred after 1980 but prior to 1996. These disturbances were created by logging activities in the area and are not subject to the requirements of R645-301 through R645-302. No areas shown on Plate 5-2C are subject to the requirements of R645-200 through R645-203.

A certified map showing the location of the topsoil stockpile is provided as Plate 2-3.

The proposed location of the sedimentation pond is noted on Plate 5-2A. No water treatment facilities will exist at the site other than the sewage leach field and the sedimentation pond.

The following facilities or activities will not exist or occur within the permit area:

- Coal preparation plant,
- Coal cleaning,
- Coal processing waste banks, dams, or embankments,
- Disposal of non-coal (non-waste rock) waste other than durable rock-type construction materials such as cinder block, and
- Air pollution control facilities.

Hence, certified maps or cross sections of these facilities are not provided in this plan. The durable rock-type construction materials will be disposed of in locations designated to receive underground development waste (i.e., at the approved waste-rock disposal facilities).

**Surface Configurations.** Certified maps and cross sections showing the proposed final (post-reclamation) surface configuration of the Dugout Canyon disturbed area are provided on Plates 5-3 and 5-4.

**Hydrology.** Certified maps and cross sections associated with the hydrology of the Dugout Canyon Mine area are provided in Chapter 7.

**Geology.** Certified maps and cross sections associated with the geology of the Dugout Canyon Mine area are provided in Chapter 6.

### **513 Compliance with MSHA Regulations and MSHA Approvals**

#### **513.100 Coal Processing Waste Dams and Embankments**

No coal processing waste dams or embankments will exist within the permit area.

#### **513.200 Impoundments and Sedimentation Ponds**

No impoundments or sedimentation ponds in the permit area will meet the size criteria of 30 CFR 77.216(a).

#### **513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil**

No coal processing waste or excess spoil will be generated within the permit area. It is not anticipated that underground development waste will be disposed of in underground mine workings.

#### **513.400 Refuse Piles**

Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A and the map in Appendix 5-7. This storage will be for a short period of time prior to ultimate disposal in the waste-rock disposal areas associated with the SUFCo, Skyline Mines and/or other permitted and approved sites. Waste rock will be disposed of after approximately 1500 CY of material accumulates or every 4 months, whichever is shorter. Runoff from the stored materials will drain to the site sedimentation pond or appropriate sediment control structures.

### **513.500 Underground Openings to the Surface**

Upon abandonment, each opening to the surface from the underground will be capped, sealed, backfilled, or otherwise properly managed in accordance with 30 CFR 75.1771. Details regarding final abandonment of mine openings are provided in Section 542.700.

### **513.600 Discharges to Underground Mines**

No discharges will occur from the surface to underground mine workings in the permit area.

### **513.700 Surface Coal Mining and Reclamation Activities**

No surface coal mining and reclamation activities will occur in the permit area.

### **513.800 Coal Mine Waste Fires**

If any coal mine waste fires occur within the permit area, these will be reported immediately to MSHA and the Division. Immediate remedial action will be taken as deemed necessary by SCM to protect public health and safety as well as the environment. Following initial remedial efforts, a long-term plan will be formulated in discussion with MSHA and the Division to extinguish any existing fires and prevent future fires.

SCM will utilize a program of prevention and suppression to minimize the potential for coal mine waste fires. An ongoing educational program will emphasize the need for attention to fire prevention. Prevention will be further enhanced by the short-term nature of the storage at the Dugout Canyon Mine. Suppression will occur by separating smoldering material and compacting the adjacent material (to minimize oxygen content in the adjacent material). The burning material will then be extinguished using appropriate methods (see Section 528.300

of this M&RP). No burning mine waste will be removed from the temporary storage area without a removal plan approved by the Division.

## **514 Inspections**

### **514.100 Excess Spoil**

Excess spoil will not be generated at the Dugout Canyon Mine.

### **514.200 Refuse Piles**

The frequency and methods of inspections of the waste-rock areas at the SUFCo and Skyline Mines is discussed in their respective M&RPs. Quarterly inspections will be made of the temporary waste-rock storage area at the mine site (see Plate 5-2A). These inspections will be performed by a professional engineer or a specialist experienced in the construction of similar earth and waste structures. The inspector will provide a certified report to the Division within two weeks after each inspection. The report will discuss any appearances of instability, structural weakness, or other hazardous conditions. A copy of this report will also be maintained at the mine site.

All activities performed at this area will be in accordance with the applicable MSHA permit.

### **514.300 Impoundments**

Regular inspections will be made during construction of the sedimentation pond and other impoundments as well as upon completion of construction. These inspections will be made

Plates 4-1 and 5-2A depict the location of an existing UP&L distribution line that will be improved and activated to provide electrical service to the mine. This distribution line, which is not classified as a major electric transmission line, will be owned and upgraded by UP&L.

As noted previously, waste rock which is generated at the Dugout Canyon Mine will be disposed of in the approved waste-rock disposal areas at the SUFCo and/or Skyline Mines.

The location of the sedimentation pond within the permit area is shown on Plate 5-2A. There will be no permanent water impoundments within the permit area.

**Landowner, Right-of-Entry, and Public Interest.** Figures 1-1 and 1-2 of Chapter 1 show the boundaries of lands and the names of present owners of record of surface lands and subsurface coal, respectively, included in or contiguous to the permit area. CFC has a legal right to enter and begin coal mining operations on all of the lands within the permit area, as noted in Chapter 1, Section 114 of this M&RP.

Coal mining and reclamation operations will be conducted within 100 feet of the right-of-way line of a public road (an as-yet unnumbered Carbon County road) only where the mine facilities road joins that right-of-way (i.e. at the downstream edge of the disturbed-area boundary).

As noted in Section 534.300, selection of the final alignment of the reconstructed county road will be the responsibility of Carbon County. It is anticipated that the county road will not be significantly realigned within the permit area. During mining and reclamation operations, this road will be used for mine access and coal haulage.

All roads upstream from the sedimentation pond are private roads.

Subsidence from underground mining operations is not projected to affect public lands where dirt roads exist within the permit and adjacent areas (see Section 525.100 of this M&RP).

### **528.200 Overburden**

No overburden will be removed, handled, stored, or transported within the permit area.

### **528.300 Spoil, Coal Processing Waste, Non-Coal Waste, and Mine Development Waste**

**Excess Spoil.** No spoil will be generated at the Dugout Canyon Mine. Sediment removed from the sedimentation pond will be handled in accordance with Section 732.200 of this M&RP.

**Coal Processing Waste.** SCM will not process their coal at the Dugout Canyon Mine beyond crushing and screening. Thus, no coal processing waste will be generated in the permit area.

**Burning and Burned Waste Utilization.** As noted below and in Section 536 of this M&RP, waste rock generated from the Dugout Canyon Mine will be disposed of at permitted facilities located at the SUFCo, Skyline Mines, or other permitted waste rock disposal sites provided the M&RP for those sites will allow for disposal of Dugout Canyon Mine waste rock. If coal mine waste fires occur at the permitted disposal sites, they will be controlled in the manner outlined in their respective permits.

Waste rock will only be temporarily stored at the surface of the Dugout Canyon Mine prior to ultimate disposal or use. If spontaneous combustion of this material does occur, the burning section will be removed from the remainder of the pile using a backhoe or other appropriate means. The affected waste rock will then be spread so that the material can cool and mixed with soil to extinguish the fire. The extinguished material will then be returned to the waste pile.

**Non-Coal Mine Waste.** Non-coal (non-waste rock) waste generated in the permit area will be temporarily stored in a dumpster to be situated at a convenient location within the disturbed

area. This dumpster will be located adjacent to the trailers shown on Plate 5-2A northeast of the coal pile. This waste will be disposed of periodically through Carbon County at a permitted landfill.

Liquid wastes such as oil and solvents will be contained and disposed of or recycled, in accordance with applicable State and Federal regulations, at facilities which are permitted to accept such wastes. Small quantities of such wastes (e.g., resulting from cleanup of small spills, etc.) may be contained onto absorbent pads prior to disposal. In all cases, disposal and/or recycling will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

No non-coal (non-waste rock) waste will be permanently disposed of within the permit area. Non-coal (non-waste rock) waste will be temporarily stored at the site prior to permanent off-site disposal either in a dumpster or in the temporary waste-rock storage area. Off-site disposal will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

It is currently anticipated that no non-coal waste that is defined as hazardous under 40 CFR 261 will be generated at the mine. If such waste is generated in the future, it will be handled in accordance with the requirements of Subtitle C of the Resource Conservation and Recovery Act and any implementing regulations.

**Underground Development Waste.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- At the approved water-rock disposal facility at the SUFCo Mine;
- At the approved waste-rock disposal facility at the Skyline Mine;
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

**Road Maintenance.** The county road will be maintained by Carbon County.

**Road Culverts.** All culverts along the county road will be designed, installed, and maintained by Carbon County. Culverts to be installed within the surface facilities have been designed in accordance with the hydrologic criteria discussed in Section 742.300. These culverts will be installed in accordance with manufacturer's recommendations to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

### **535 Spoil**

No spoil will be generated in the permit area. No valley fills or head-of-hollow fills will be created for the disposal of spoil material. Furthermore, no excess spoil will be disposed of in pre-existing benches.

### **536 Coal Mine Waste**

Coal mine waste resulting from mining activities at the Dugout Canyon Mine will be disposed of at an approved waste-rock disposal facilities such as those operated at the SUFCo Mine or at the Skyline Mine. Both of these are sister operations of SCM. Descriptions of the aforementioned waste-rock disposal facilities are presented in the respective M&RPs.

The coal mine waste generated from the Dugout Canyon Mine may be temporarily stored on the surface of the Dugout Canyon Mine facilities at the location shown on Plate 5-2A prior to ultimate disposal. Coal mine waste which is stored at the mine site will be removed from the temporary waste-rock storage area and placed in its final disposal area at the frequency noted in Section 513.400 of this M&RP. Runoff from the temporary waste-rock storage area will report to the mine-site sedimentation pond and be treated accordingly. During the period of temporary storage, berms will be installed around the temporary storage area to contain and direct runoff to ditch DD-2a (see Plate 7-5). The berms around the temporary waste-rock

storage area are not noted on Plate 7-5 or elsewhere since these will be located as necessary, depending upon the extent of the waste-rock storage.

### **536.100 Design**

The waste-rock disposal facilities at the SUFCo Mine and Skyline Mine were designed to achieve minimum long-term static safety factors of at least 1.5. These designs and the associated evaluations were based on the results of detailed foundation and laboratory analyses of soils at the sites of the disposal facilities.

Due to the temporary nature of the waste-rock storage area shown on Plate 5-2A, the long-term static safety factor of this material has not been evaluated. Foundation conditions beneath the pad on which the waste rock will be temporarily stored are discussed in Chapter 2 and Appendix 5-4 of this M&RP.

### **536.200 Waste Emplacement**

Waste rock from the Dugout Canyon Mine that is to be hauled to the SUFCo, Skyline Mine, or other approved disposal sites will be emplaced in accordance with the respective M&RPs. This waste will be placed in a controlled manner to ensure the mass stability of the waste piles and prevent mass movement during and after construction. The waste rock will be covered periodically to minimize public hazards and the potential for spontaneous combustion.

Waste rock will be emplaced in the temporary storage *areas* at the Dugout Canyon Mine using front-end loaders and other appropriate earth-moving equipment. Due to the temporary nature of this storage, mass movement, public hazards, and spontaneous combustion of the material will not occur prior to its ultimate disposal.

### **536.800 Coal Processing Waste Banks, Dams, and Embankments**

No coal processing waste banks, dams, or embankments will exist within the permit area.

### **536.900 Refuse Piles**

A detailed description of the waste-rock disposal sites at the SUFCo, Skyline Mines, and other potential permitted disposal sites is provided in their respective M&RPs. These M&RPs provide:

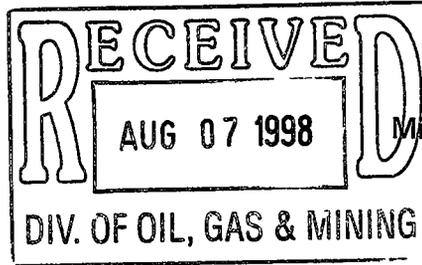
- A description of pre-disturbance soils at the sites;
- Certification of the design and plans;
- Compliance with applicable MSHA regulations;
- A description of proposed inspection activities;
- A description of the design, stability, operation, and reclamation of the waste-rock sites; and
- A discussion of runoff- and sediment-control plans associated with the sites.

The suitability of the waste rock to be generated from the Dugout Canyon Mine for reclamation is discussed in Chapters 2 and 6 of this M&RP.

With respect to the temporary waste-rock disposal area designated on Plate 5-2A, the following information can be found in the indicated sections of this M&RP:

- A description of pre-disturbance soils at the sites - Chapter 2
- A description of the suitability of the waste rock for reclamation - Chapters 2 and 6
- Certification of the design and plans - Section 512

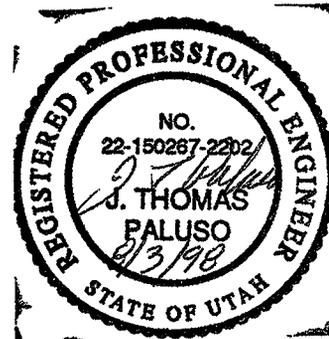
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Mining and Reclamation Plan  
August 1998

**APPENDIX 5-7**

**NEW TEMPORARY WASTE ROCK STORAGE LOCATION INFORMATION**



This appendix includes the following items:

- A description of the material to be stored,
- A brief material handling description,
- Stockpile capacity,
- A cross section of the temporary waste rock pile,
- Chemical analysis of the waste rock to be stored.

The description of the material and material handling plan follows below while the remaining three items are included in the attached pages.

**Material Description:**

The waste rock material consists of shale, siltstone, and sandstone fragments. This material has fallen from the roof of the mine over the past 40 years. The material consists of angular sand, gravel, and cobble size clasts. Acid- and toxic-forming analysis results have been included in the attached pages. As noted on the cross section sheet, the storage volume is 1926 CY.

**Material Handling:**

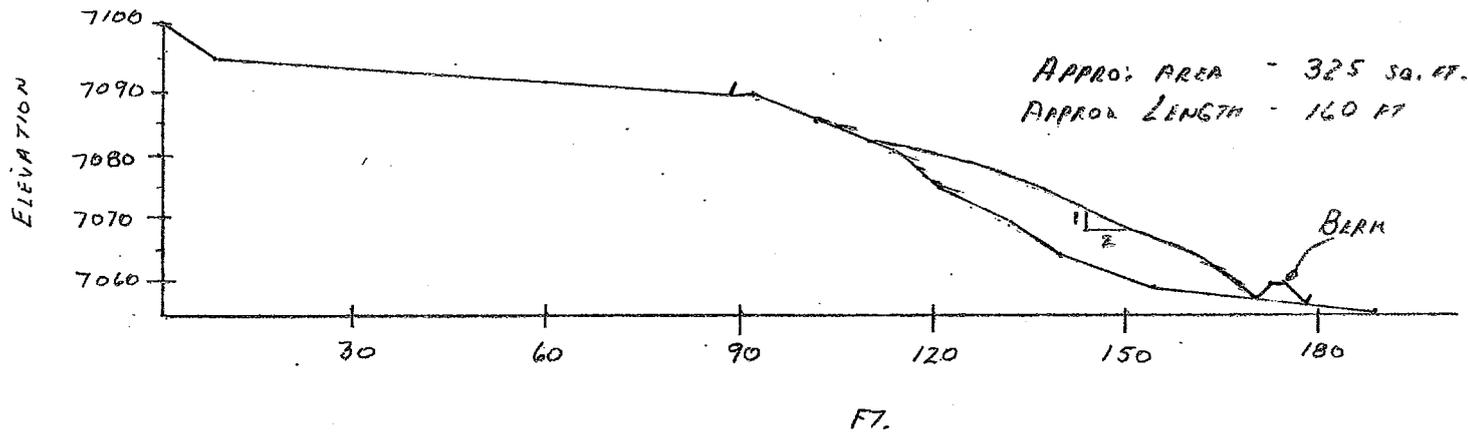
The waste rock will be scooped and loaded underground using underground mining equipment. The waste rock will then be brought to the surface and dumped over the existing pad slope as shown in the attached figure. As waste rock accumulates on and at the base of the slope, appropriate earthmoving equipment will be used to distribute the waste rock within the containment area. This will allow for the maximum storage volume to be achieved and reduce the risk of creating unstable slopes. Every 1000 tons of waste rock removed will be tested for acid- and toxic- forming characteristics after it has been stored at the surface for approximately two weeks. If it is not found to have acid- or toxic-forming characteristics, it may be used for fill during mine site construction activities. It will be placed and compacted as fill following the methods described in the approved M&RP. If the waste rock is found to be unsuitable as fill, it will be transported to either the SUFCo or Skyline Mine waste rock storage areas as approved in the M&RP.



TYPICAL CROSS-SECTION  
TEMPORARY WASTE ROCK  
STORAGE AREA

10 June 1998  
G. TAYLOR

$$\begin{aligned} \text{VOLUME} &= 325 \text{ SQ. FT.} \times 160 \text{ FT.} / 27 \text{ CU. FT. / CU. YD.} \\ &= 1926 \text{ CU. YD.} \end{aligned}$$



SCALE 1" = 30' H AND V

22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS





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SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

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Lab No.	Location	Depth feet	pH	EC umhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124887	ROCK CYN ROOF	0.0-0.0	7.8	1.53	24.2	3.49	8.06	4.34	1.81		72.4	20.0	7.6	SANDY LOAM
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124889	COAL	0.0-0.0	8.4	0.97	58.4	0.42	0.46	8.02	12.1		88.4	9.0	2.6	SAND
124890	GILSON ROOF	0.0-0.0	7.5	0.66	28.1	2.34	2.79	0.88	0.55		39.4	41.0	19.6	LOAM
124891	FLOOR	0.0-0.0	7.8	1.58	23.4	3.35	8.76	4.57	1.86		69.4	22.0	8.6	SANDY LOAM
124892	COAL	0.0-0.0	7.2	2.30	56.7	23.2	5.68	0.85	0.22		88.4	8.0	3.6	SAND

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P004/009

TO SKYLINE

06-11-98 12:14PM FROM 801 637 0108



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Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124887	ROCK CYN ROOF	0.0-0.0	3.6	0.17	5.31	181.	176.					
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124889	COAL	0.0-0.0	93.3	0.38	11.9	43.6	31.7					
124890	GILSON ROOF	0.0-0.0	4.9	0.02	0.62	1.74	1.12					
124891	FLOOR	0.0-0.0	4.5	0.09	2.81	173.	171.					
124892	COAL	0.0-0.0	93.3	0.45	14.1	23.8	9.69					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P005/009

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Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124887	ROCK CYN ROOF	0.0-0.0	1.02	0.28	0.02	0.37	0.26	2.24	0.03	9.6	2.4
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124889	COAL	0.0-0.0	1.22	1.64	<0.02	0.69	0.22	1.30	0.77	9.5	8.1
124890	GILSON ROOF	0.0-0.0	1.20	0.97	0.08	0.28	0.26	8.62	0.04	14.9	4.1
124891	FLOOR	0.0-0.0	1.26	0.28	0.02	0.38	0.27	2.40	0.03	13.7	2.9
124892	COAL	0.0-0.0	1.20	1.77	<0.02	0.39	0.34	1.38	0.74	17.8	7.9

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P006/009

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Page 1 of

Lab No.	Location	Depths feet	pH	EC mmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124894	124888(DOP)	0.0-0.0	7.8	0.94	35.6	4.18	4.53	0.80	0.38		67.4	23.0	9.6	SANDY LOAM

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P007/009

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WELLINGTON, UTAH

August 24, 1995

Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124894	124888(DUP)	0.0-0.0	1.6	0.02	0.62	92.0	91.4					

Abbreviations used in acid-base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P008/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 3 of

Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124894	124888(DUP)	0.0-0.0	1.04	0.28	<0.02	0.28	0.25	3.54	0.02	14.6	2.8

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P009/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM

Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine

Mining and Reclamation Plan  
August 1998

## **SLOPE STABILITY ANALYSIS**

July 27, 1998



**EarthFax**

Mr. Chris Hansen  
Canyon Fuel Company, LLC  
Skyline Mine  
P.O. Box 719  
Helper, UT 84526

EarthFax  
Engineering Inc.  
Engineers/Scientists  
7324 So. Union Park Ave.  
Suite 100  
Midvale, Utah 84047  
Telephone 801-561-1555  
Fax 801-561-1861

Subject: Stability of Temporary Waste-Rock Pile  
at the Dugout Canyon Mine

Dear Chris:

Pursuant to your request, we have evaluated the stability of the temporary waste-rock pile at the Dugout Canyon Mine in Carbon County, Utah. This pile has been created from the sidecast of roof-fall and other rock materials being cleaned from the old Dugout Canyon portals. The material has been sidecast off the old portal pad to an area adjacent to the dirt road which exists at an elevation approximately 20 to 25 feet lower than the pad. This analysis was performed to address the concerns expressed by the Utah Division of Oil, Gas and Mining at a recent site meeting.

A sample of the sidecast waste rock was collected and submitted to Applied Geotechnical Engineering Consultants, Inc. for analyses of the following physical properties:

- Particle-size analysis (ASTM D-422)
- Atterberg limits (ASTM D-4318)
- Direct shear (ASTM D-3080)
- Standard Proctor (ASTM D-698)

Results of these analyses are presented in Attachment A. According to these analyses, the waste rock is coarse-grained, with approximately 95 percent retained on the No. 200 sieve (i.e., sand fraction or larger) and approximately 82 percent being retained on the No. 4 sieve (i.e., gravel fraction). The material has further been classified as poorly-graded, with a Unified Soil Classification of GP-GM. The sample had an internal angle of friction of 35 degrees and a cohesive strength of 490 pounds per square foot.

Slope-stability analyses were performed using the computer program GEOSLOPE (Version 5.0), which is based on the FORTRAN program STABL3, developed at Purdue University. GEOSLOPE utilizes the limit equilibrium procedure of slices (Simplified Bishop's method) to determine the safety factor of potential failure surfaces for circular shapes.

Given the lack of seepage from the pad outslope, the slope-stability analyses were conducted based on unsaturated conditions. The materials were assumed to drain rapidly with no excess pore pressures developing in response to strains and stress changes.

Mr. Chris Hansen  
July 27, 1998  
Page 2

The engineering properties of the pad and other soil materials at the site were obtained from Appendix 5-4 of the Dugout Canyon Mine Phase II Mining and Reclamation Plan. Two conditions were evaluated

- Condition I - failure surfaces were allowed to begin and end in the road and pad areas, outside of the waste rock,
- Condition II - failure surfaces were allowed to begin and end only within the waste rock.

Results of the slope-stability analyses are presented in Attachment B. As indicated, the minimum safety factor for Condition I was determined to be 2.67. The minimum safety factor under Condition II is 2.83. Hence, the waste rock and the adjacent slope are stable.

Please contact me if you have any questions.

Sincerely,



Richard B. White, P.E.  
President

Attachments



Mr. Chris Hansen  
July 27, 1998  
Page 3

**ATTACHMENT A**

Results of Waste-Rock Analyses



Applied Geotechnical Engineering Consultants, Inc.

July 15, 1998

Earthfax Engineering  
7324 South 1300 East, Suite 100  
Midvale, UT 84047

Attention: Richard B. White  
Subject: Soils Laboratory Testing  
AGEC Project No. 973301

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to provide laboratory testing on a sample received July 2, 1998. The following tests have been performed in general accordance with the test method listed.

Test	Test Method
Particle Size Analysis	ASTM D-422
Atterberg Limits	ASTM D-4318
Direct Shear	ASTM D-3080
Standard Proctor	ASTM D-698

The results of the laboratory testing are shown graphically in Figures 1-2. The direct shear test specimens were remolded to approximately 90% of the standard proctor maximum dry density near optimum moisture content. Only material passing the #4 sieve was used in direct shear testing.

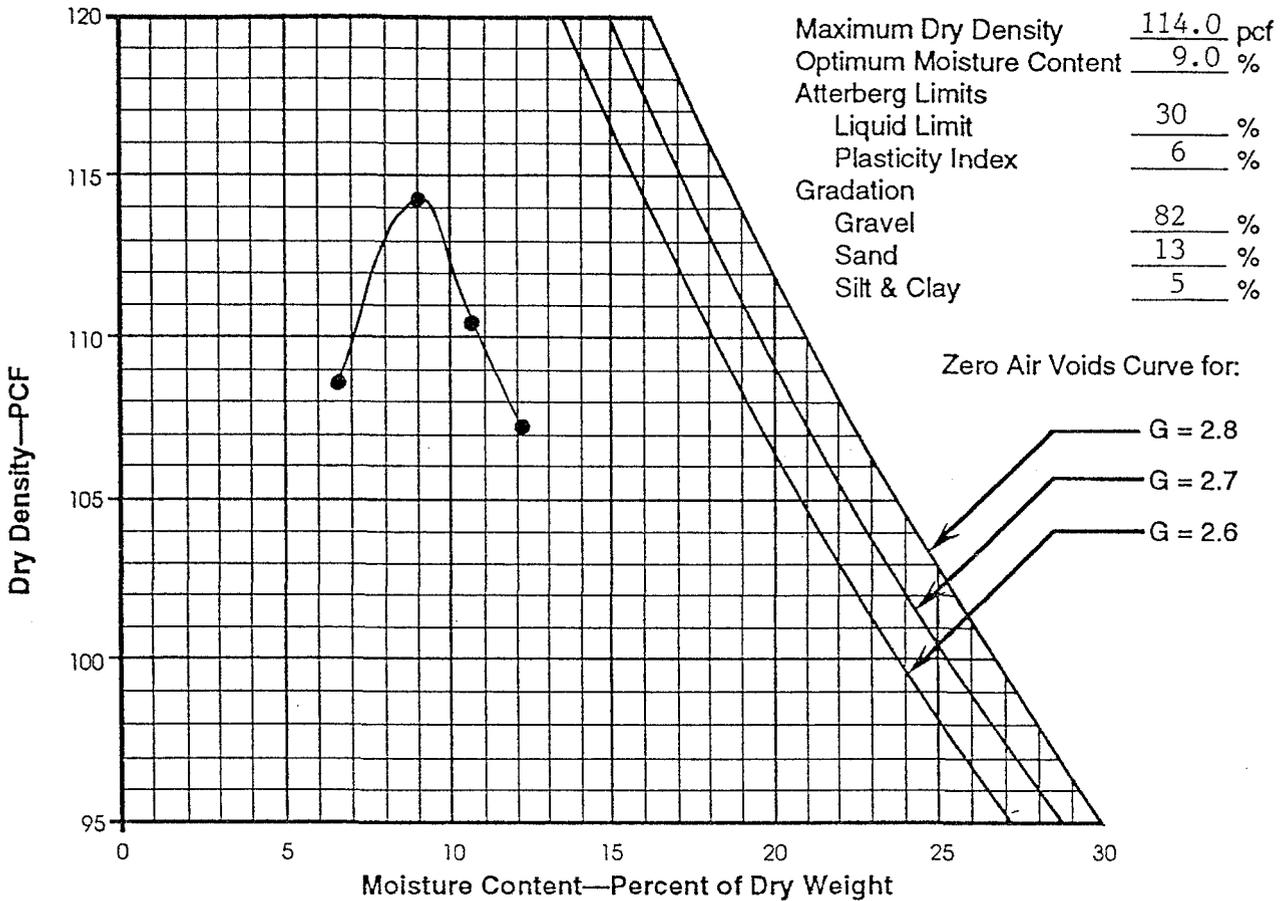
If you have any questions, or if we can be of further service, please call.

Sincerely,

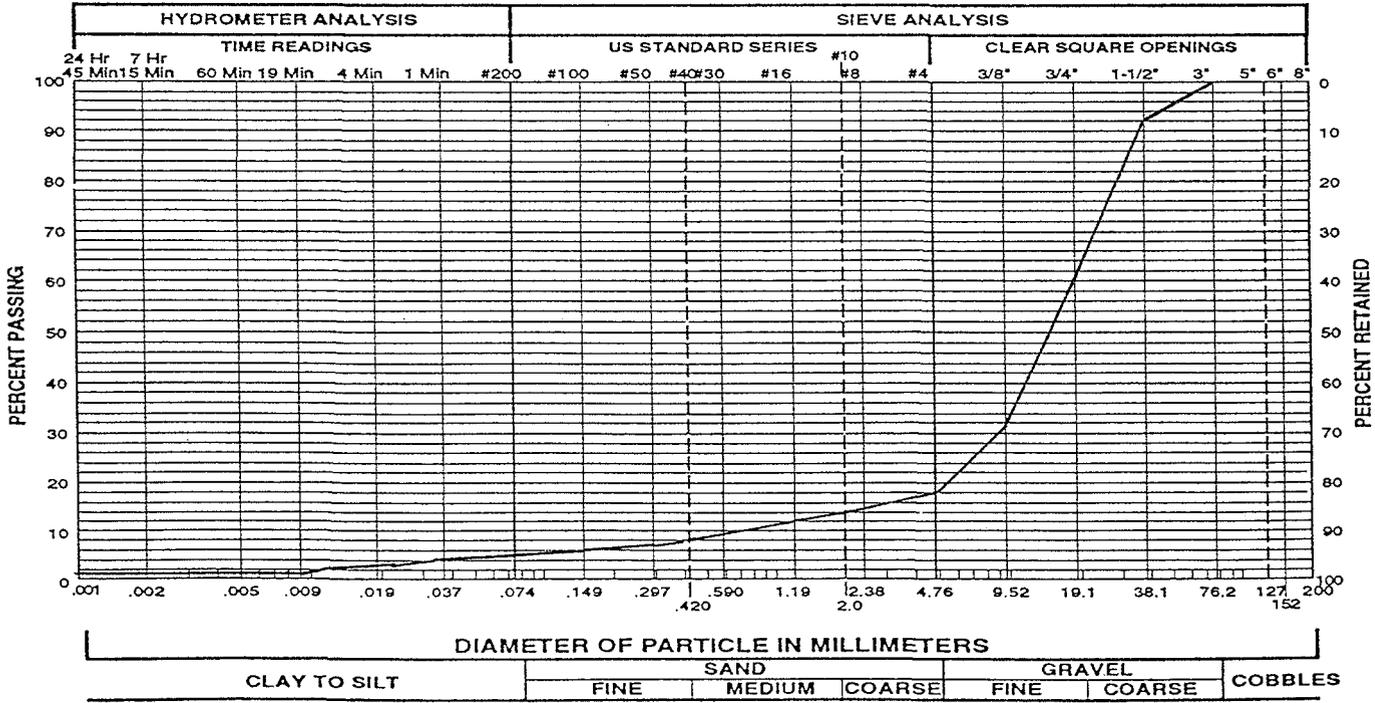
APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

*Stephanie Francom*  
Stephanie Francom  
Rev. SDA, E.I.T.

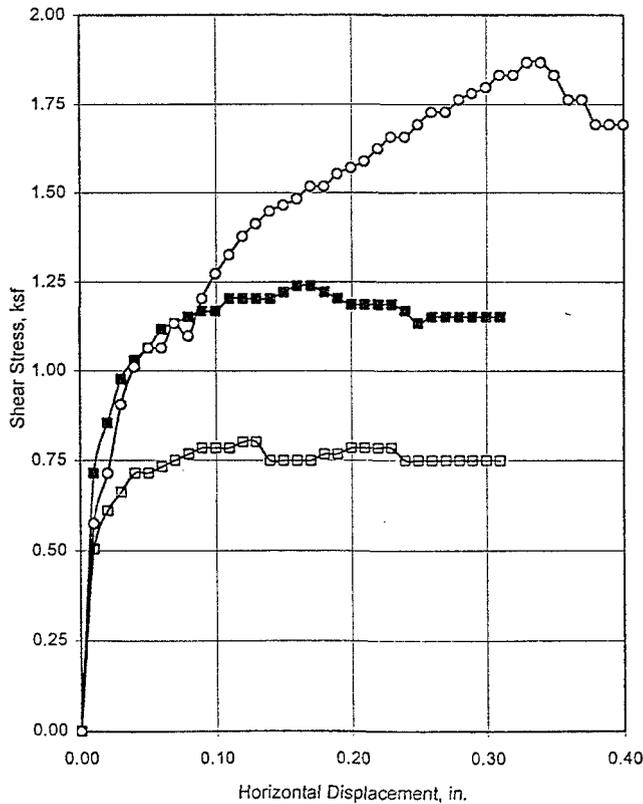
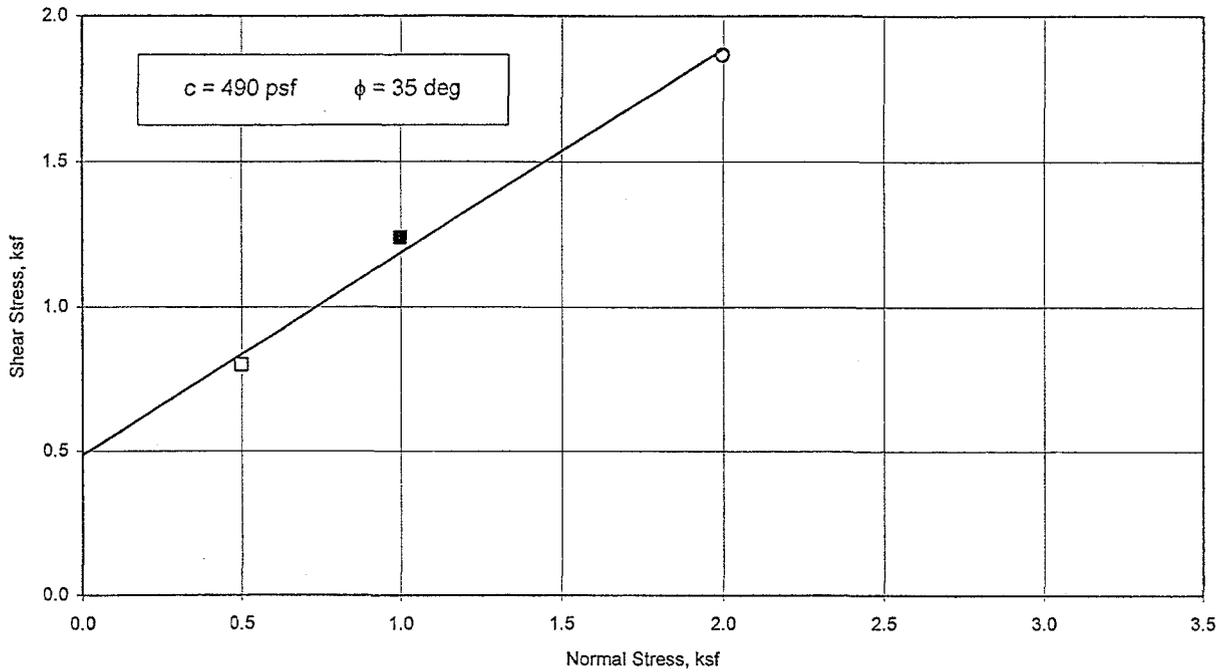
# Applied Geotechnical Engineering Consultants, Inc.



Compaction Test Procedure ASTM D-698 Method D  
 Sample of: Poorly-Graded Gravel with From: DCM-1 (7/6/98)  
Silt (GP-GM)



# Applied Geotechnical Engineering Consultants, Inc.



Test No. (Symbol)	1(□)	2(■)	3(O)
Sample Type	Remolded		
Length, in.	0.75	0.75	0.75
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	112	112	112
Moisture Content, %	9	9	9
Consolidation Load, ksf	0.5	1.0	2.0
Normal Load, ksf	0.5	1.0	2.0
Shear Stress, ksf	0.80	1.24	1.87
Remarks	Strain Rate 0.05 in/min. Only soil passing the #4 sieve was used in test.		

Sample Index Properties	
Dry Density, pcf	N/A
Moisture Content, %	N/A
Liquid Limit, %	30
Plasticity Index, %	6
Percent Gravel	82
Percent Sand	13
Percent Passing No. 200 Sieve	5

Type of Test Consolidated Undrained/Saturated  
 Sample Description Poorly Graded Gravel with Silt (GP-GM) From DCM-1

Project No. 973301

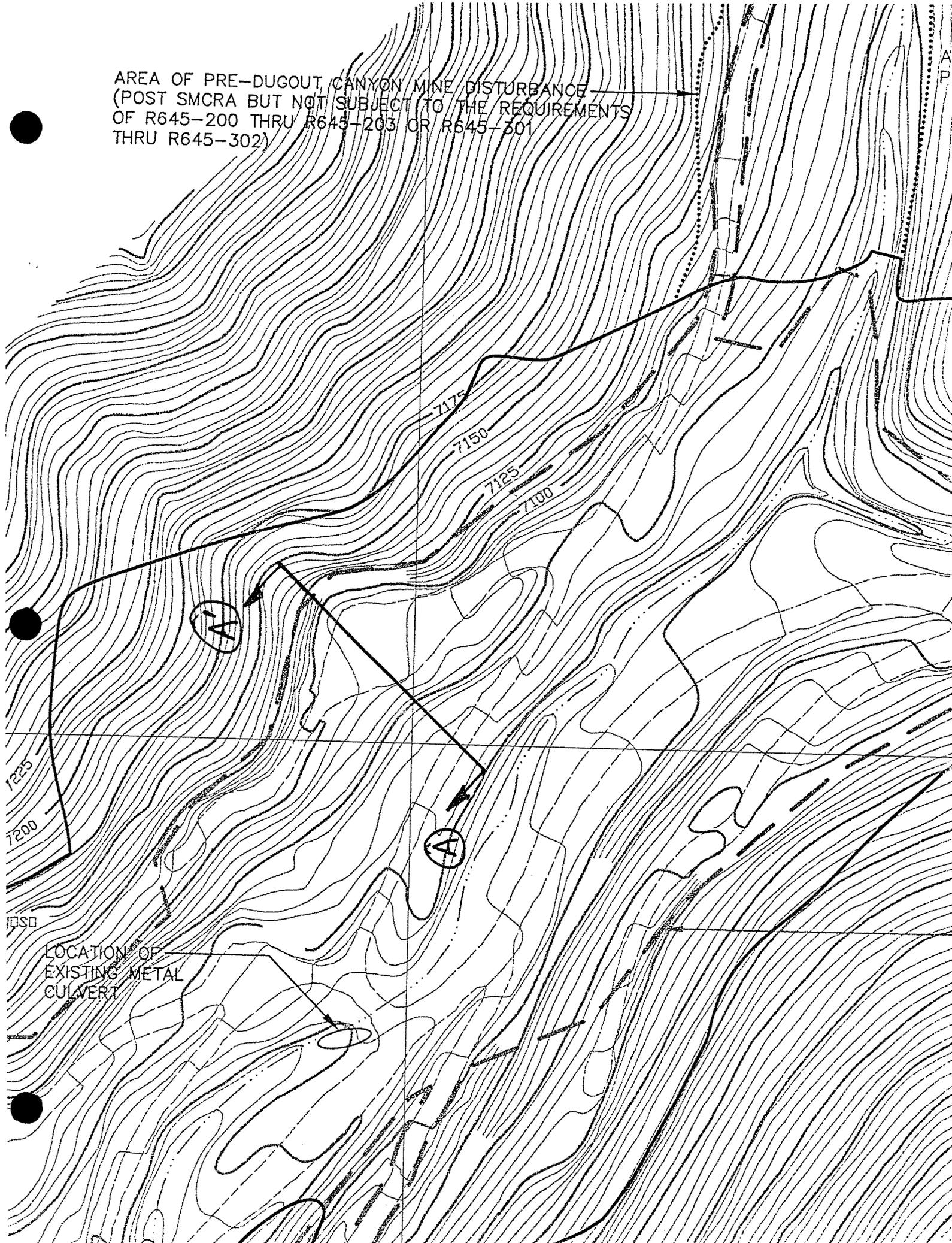
## DIRECT SHEAR TEST RESULTS

Figure 2

**ATTACHMENT B**

Results of Slope-Stability Analyses

AREA OF PRE-DUGOUT CANYON MINE DISTURBANCE  
(POST SMCRA BUT NOT SUBJECT TO THE REQUIREMENTS  
OF R645-200 THRU R645-203 OR R645-301  
THRU R645-302)



LOCATION OF  
EXISTING METAL  
CULVERT

GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY — *Failure surfaces can begin and end outside of the waste rock*

Remarks :

#### INPUT DATA

##### Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

##### Soil Parameters

Number of Soil Types : 2

#### TRIAL SURFACE GENERATION

##### Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 30.00 ft  
Right Initiation Point : 69.00 ft  
Left Termination Point : 70.00 ft  
Right Termination Point : 120.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

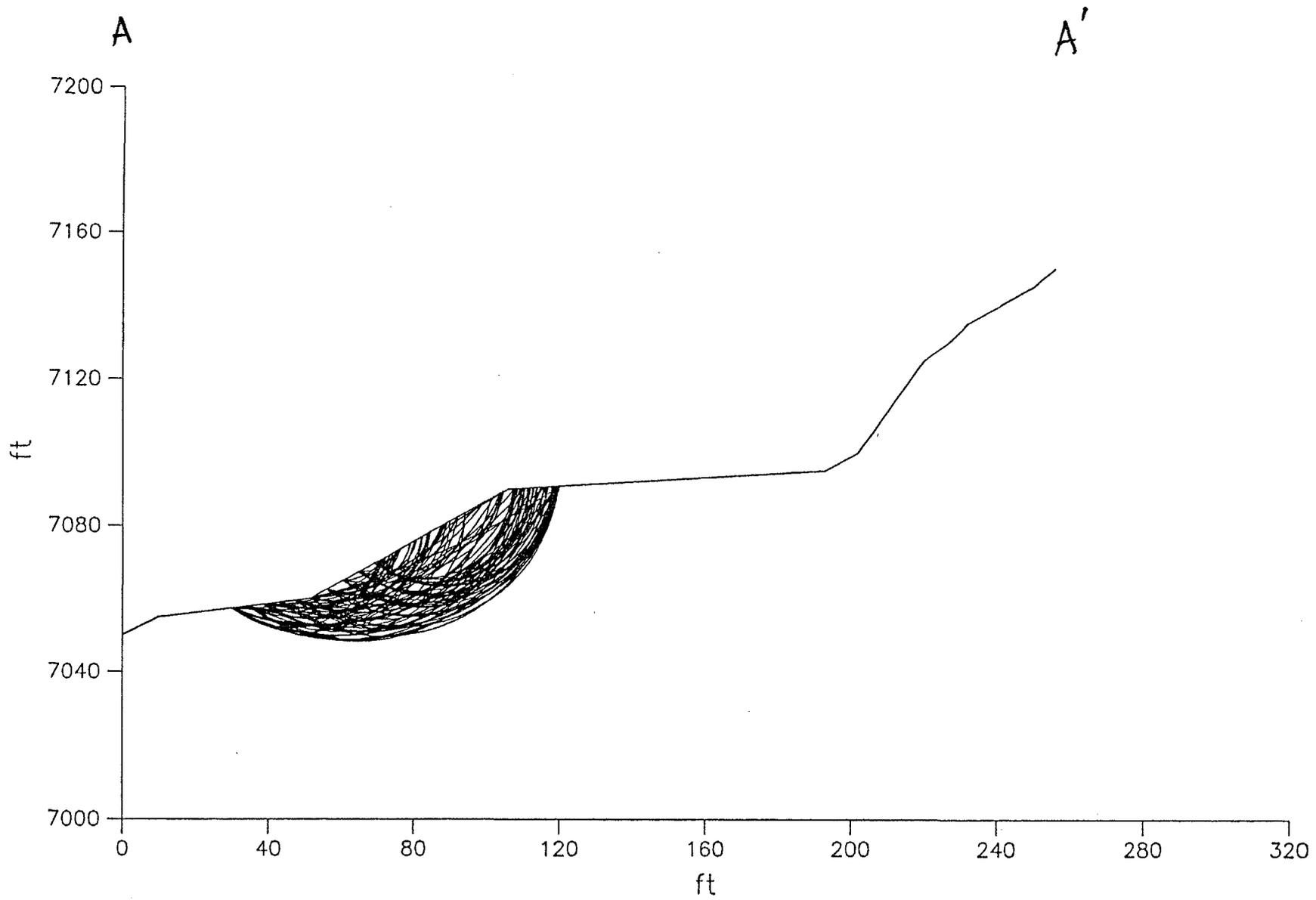
#### RESULTS

##### Critical Surface

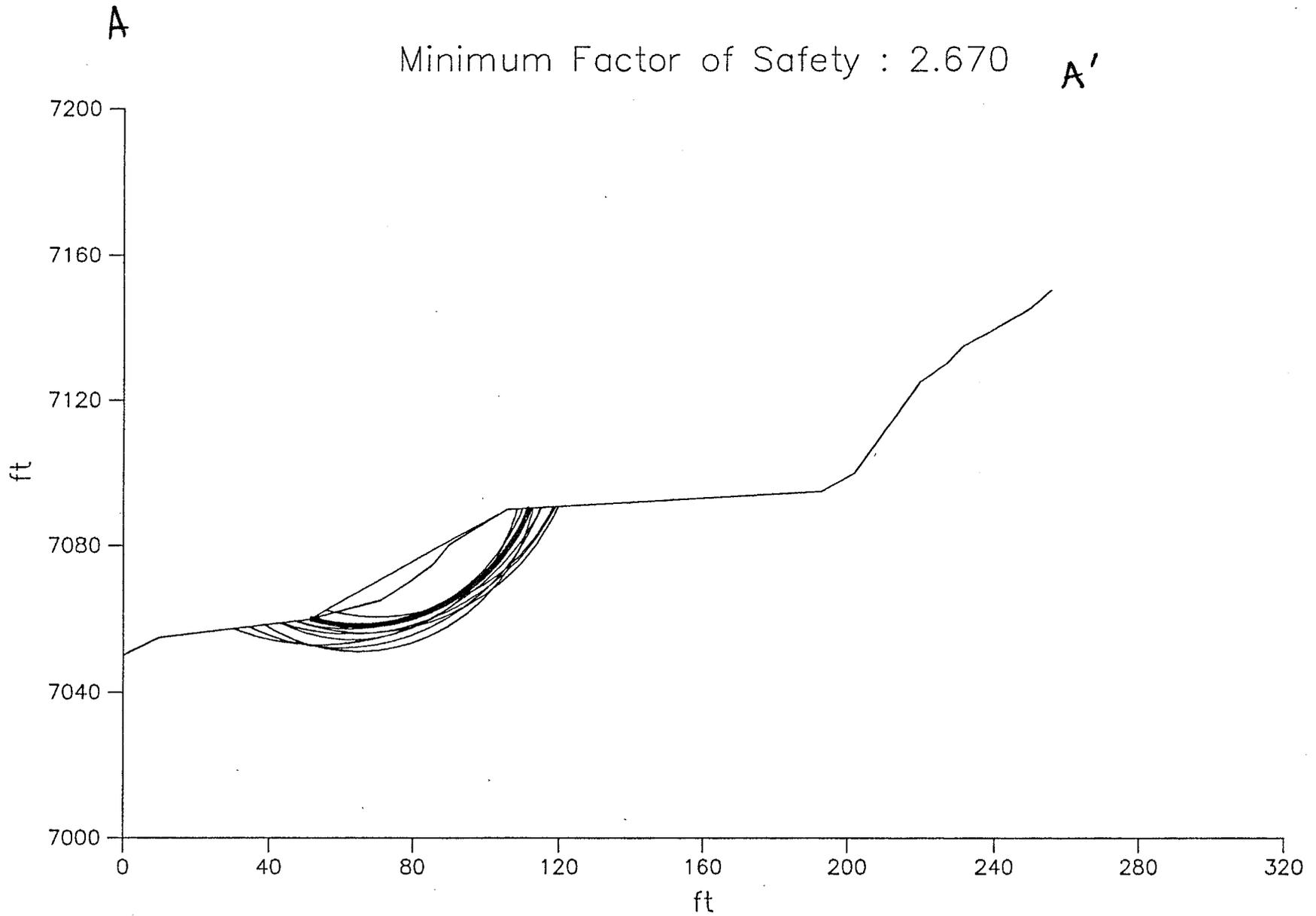
Factor of Safety : 2.670

□

# Circular Surfaces – Search for Critical Surfaces



Circular Surfaces – Most Critical Surfaces



GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY -

Remarks :

*Failure surfaces can begin and end  
in the waste rock only*

INPUT DATA

Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

Soil Parameters

Number of Soil Types : 2

TRIAL SURFACE GENERATION

Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 51.50 ft  
Right Initiation Point : 71.50 ft  
Left Termination Point : 86.00 ft  
Right Termination Point : 106.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

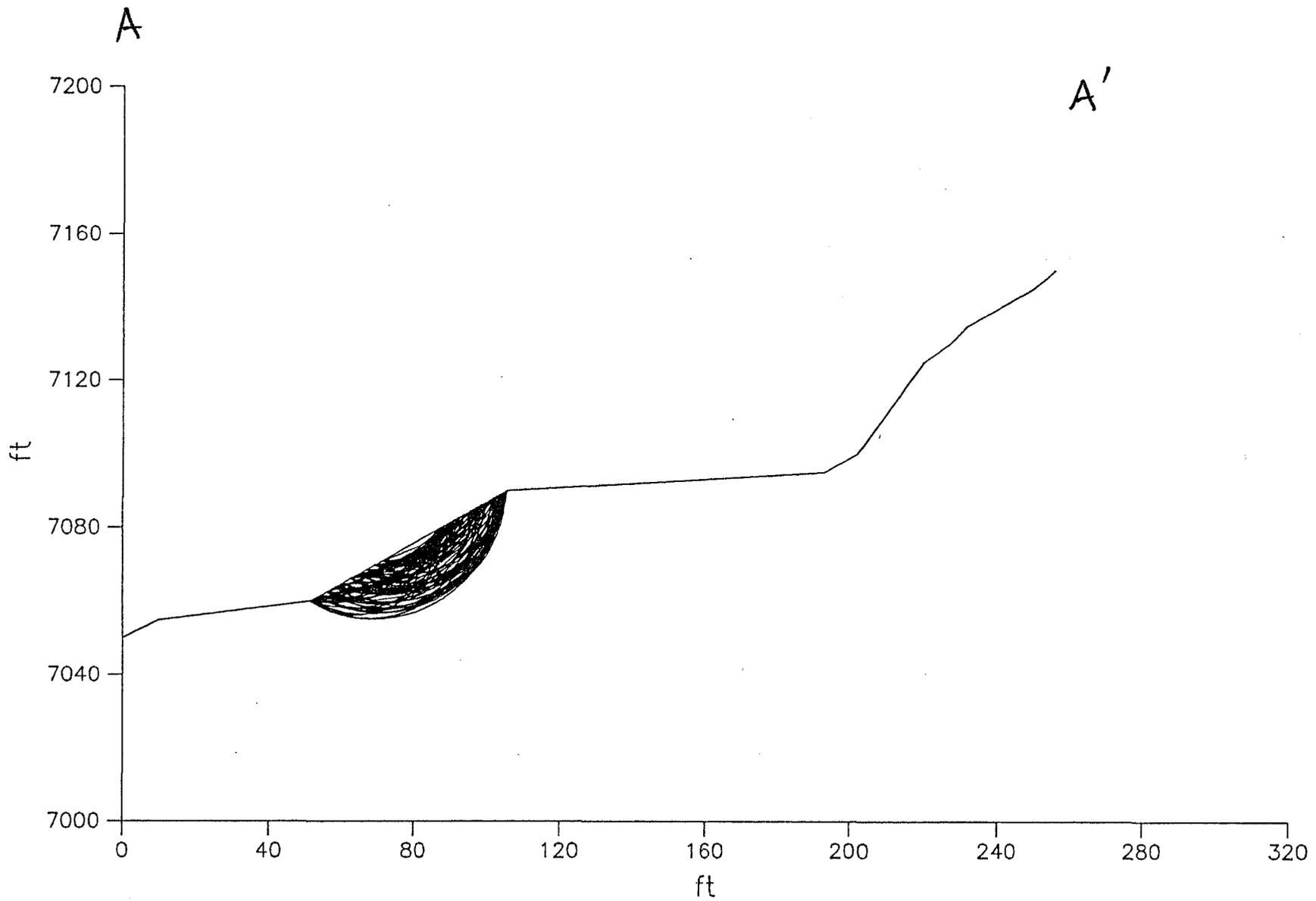
RESULTS

Critical Surface

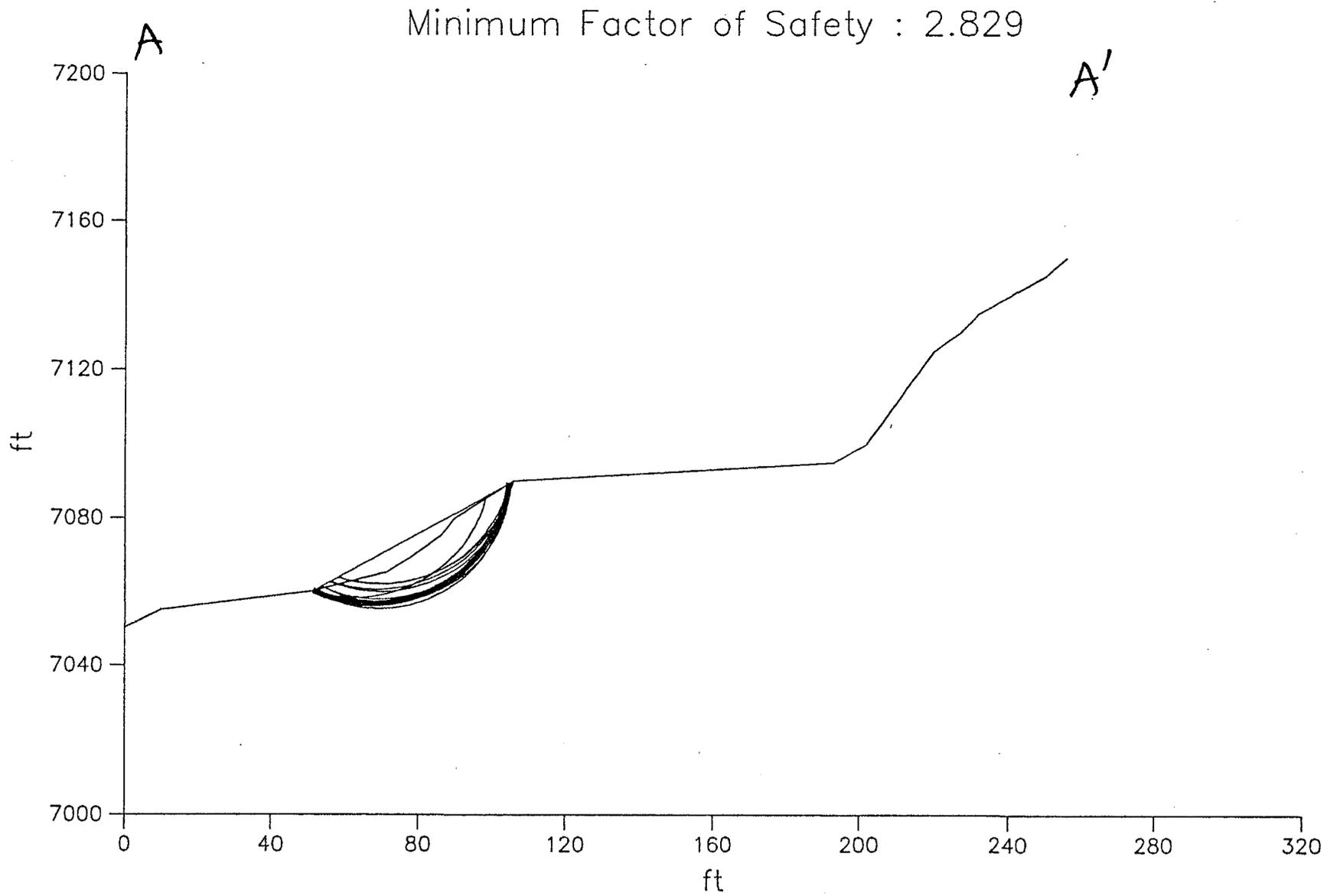
Factor of Safety : 2.829

□

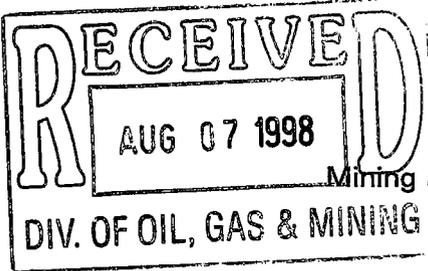
# Circular Surfaces – Search for Critical Surfaces



Circular Surfaces - Most Critical Surfaces



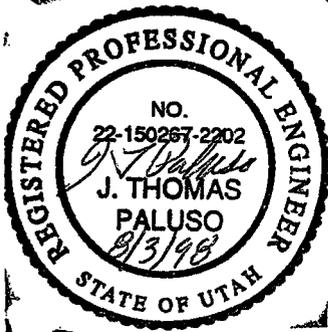
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

**APPENDIX 7-12**

**NEW TEMPORARY WASTE ROCK STORAGE DIVERSION STRUCTURES**



This appendix includes a figure illustrating the new temporary waste rock storage area, containment berm, silt fence locations, and surface runoff flow direction in the storage area and calculations supporting the design of the berms for a 100-year 6-hour storm event that produces 2.05 inches of precipitation. Silt fences are located down gradient of the storage area as shown on the attached figure to treat runoff from the berm and road.

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

RUNOFF FROM MINE WASTE ROCK PILE

by

Name: Gary E. Taylor

Company Name: CANYON FUEL CO., SKYLINE MINE  
File Name: C:\SEDCAD3\SPOIL

Date: 06-15-1998

Civil Software Design -- SEDCAD+ Version 3.1  
Copyright (C) 1987-1992. Pamela J. Schwab. All rights reserved.

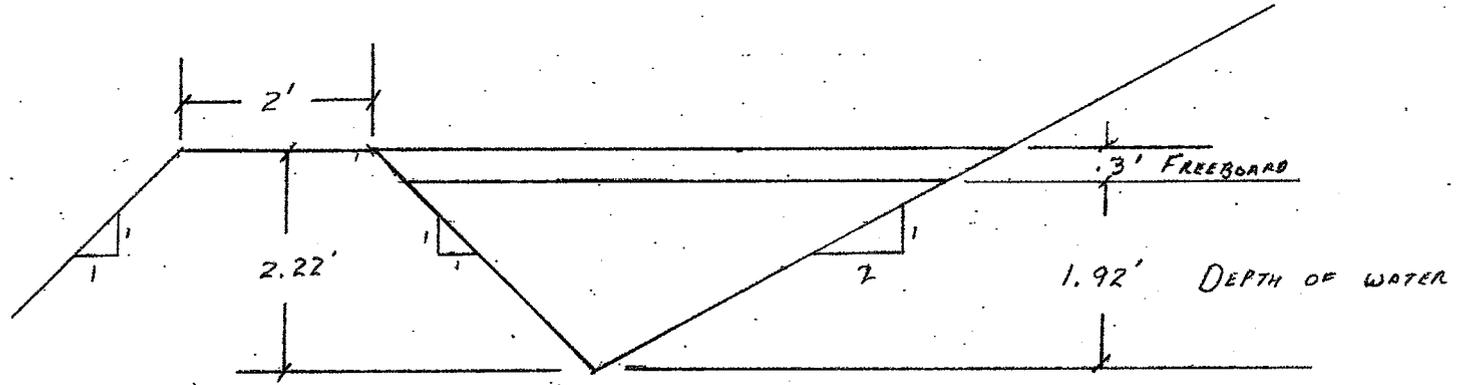
Company Name: CANYON FUEL CO., SKYLINE MINE  
Filename: C:\SEDCAD3\SPOIL User: Gary E. Taylor  
Date: 06-15-1998 Time: 15:41:04  
Runoff from Mine Waste Rock Pile  
Storm: 2.05 inches, 100 year- 6 hour, SCS Type II  
Hydrograph Convolution Interval: 1.0 hr

=====  
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE  
=====

-Hydrology-

JBS SWS	Area (ac)	CN UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111 1	0.33	85 M	0.030	0.000	0.000	0.0	0.02	0.44
			Type: Null	Label: spoil				
111 Structure	0.33						0.02	
111 Total IN/OUT	0.33						0.02	0.44

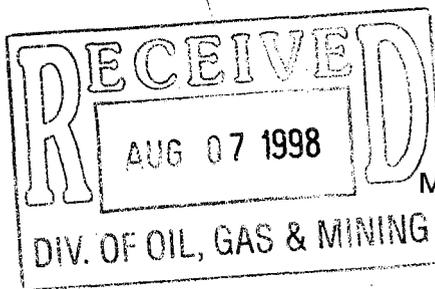
TYPICAL CROSS-SECTION  
OF CONFINEMENT AREA



22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS







**Surface Facilities.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of :

- At the approved waste-rock disposal facility at the SUFCo Mine (a sister operation of SCM);
- At the approved waste-rock disposal facility at the Skyline Mine (also a sister operation of SCM); or
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

Copies of the Division correspondence approving the SUFCo and Skyline waste-rock disposal facilities for receipt of Dugout Canyon waste rock are provided in Appendix 5-2.

Certified maps and cross sections concerning the disposal of underground development waste at the SUFCo and Skyline Mines are provided in the respective Mining and Reclamation Plans (M&RPs) for those mines. A certified map showing the proposed location of non-coal (non-waste rock) waste storage, coal storage and loading areas, and explosive storage and handling facilities, is provided as Plate 5-2A. Cross sections of the proposed facilities area are provided on Plate 5-2B. A location map, cross section, material description, volume calculation, and slope stability analysis for a temporary waste rock storage area to be utilized during site construction is included in Appendix 5-7.

A map of the existing topography prior to disturbance by SCM is provided as Plate 5-2C. Also noted on Plate 5-2C is the area of disturbance which was mapped to exist at the site in 1980. Since mining ceased at the site in 1964 (as noted earlier in this section), this boundary represents the area of pre-SMCRA disturbance. Plate 5-2C also shows areas of non-mining disturbance which occurred after 1980 but prior to 1996. These disturbances were created by logging activities in the area and are not subject to the requirements of R645-301 through R645-302. No areas shown on Plate 5-2C are subject to the requirements of R645-200 through R645-203.

A certified map showing the location of the topsoil stockpile is provided as Plate 2-3.

The proposed location of the sedimentation pond is noted on Plate 5-2A. No water treatment facilities will exist at the site other than the sewage leach field and the sedimentation pond.

The following facilities or activities will not exist or occur within the permit area:

- Coal preparation plant,
- Coal cleaning,
- Coal processing waste banks, dams, or embankments,
- Disposal of non-coal (non-waste rock) waste other than durable rock-type construction materials such as cinder block, and
- Air pollution control facilities.

Hence, certified maps or cross sections of these facilities are not provided in this plan. The durable rock-type construction materials will be disposed of in locations designated to receive underground development waste (i.e., at the approved waste-rock disposal facilities).

**Surface Configurations.** Certified maps and cross sections showing the proposed final (post-reclamation) surface configuration of the Dugout Canyon disturbed area are provided on Plates 5-3 and 5-4.

**Hydrology.** Certified maps and cross sections associated with the hydrology of the Dugout Canyon Mine area are provided in Chapter 7.

**Geology.** Certified maps and cross sections associated with the geology of the Dugout Canyon Mine area are provided in Chapter 6.

### **513 Compliance with MSHA Regulations and MSHA Approvals**

#### **513.100 Coal Processing Waste Dams and Embankments**

No coal processing waste dams or embankments will exist within the permit area.

#### **513.200 Impoundments and Sedimentation Ponds**

No impoundments or sedimentation ponds in the permit area will meet the size criteria of 30 CFR 77.216(a).

#### **513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil**

No coal processing waste or excess spoil will be generated within the permit area. It is not anticipated that underground development waste will be disposed of in underground mine workings.

#### **513.400 Refuse Piles**

Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A and the map in Appendix 5-7. This storage will be for a short period of time prior to ultimate disposal in the waste-rock disposal areas associated with the SUFCo, Skyline Mines and/or other permitted and approved sites. Waste rock will be disposed of after approximately 1500 CY of material accumulates or every 4 months, whichever is shorter. Runoff from the stored materials will drain to the site sedimentation pond or appropriate sediment control structures.

### **513.500 Underground Openings to the Surface**

Upon abandonment, each opening to the surface from the underground will be capped, sealed, backfilled, or otherwise properly managed in accordance with 30 CFR 75.1771. Details regarding final abandonment of mine openings are provided in Section 542.700.

### **513.600 Discharges to Underground Mines**

No discharges will occur from the surface to underground mine workings in the permit area.

### **513.700 Surface Coal Mining and Reclamation Activities**

No surface coal mining and reclamation activities will occur in the permit area.

### **513.800 Coal Mine Waste Fires**

If any coal mine waste fires occur within the permit area, these will be reported immediately to MSHA and the Division. Immediate remedial action will be taken as deemed necessary by SCM to protect public health and safety as well as the environment. Following initial remedial efforts, a long-term plan will be formulated in discussion with MSHA and the Division to extinguish any existing fires and prevent future fires.

SCM will utilize a program of prevention and suppression to minimize the potential for coal mine waste fires. An ongoing educational program will emphasize the need for attention to fire prevention. Prevention will be further enhanced by the short-term nature of the storage at the Dugout Canyon Mine. Suppression will occur by separating smoldering material and compacting the adjacent material (to minimize oxygen content in the adjacent material). The burning material will then be extinguished using appropriate methods (see Section 528.300

of this M&RP). No burning mine waste will be removed from the temporary storage area without a removal plan approved by the Division.

## **514 Inspections**

### **514.100 Excess Spoil**

Excess spoil will not be generated at the Dugout Canyon Mine.

### **514.200 Refuse Piles**

The frequency and methods of inspections of the waste-rock areas at the SUFCo and Skyline Mines is discussed in their respective M&RPs. Quarterly inspections will be made of the temporary waste-rock storage area at the mine site (see Plate 5-2A). These inspections will be performed by a professional engineer or a specialist experienced in the construction of similar earth and waste structures. The inspector will provide a certified report to the Division within two weeks after each inspection. The report will discuss any appearances of instability, structural weakness, or other hazardous conditions. A copy of this report will also be maintained at the mine site.

All activities performed at this area will be in accordance with the applicable MSHA permit.

### **514.300 Impoundments**

Regular inspections will be made during construction of the sedimentation pond and other impoundments as well as upon completion of construction. These inspections will be made

Plates 4-1 and 5-2A depict the location of an existing UP&L distribution line that will be improved and activated to provide electrical service to the mine. This distribution line, which is not classified as a major electric transmission line, will be owned and upgraded by UP&L.

As noted previously, waste rock which is generated at the Dugout Canyon Mine will be disposed of in the approved waste-rock disposal areas at the SUFCo and/or Skyline Mines.

The location of the sedimentation pond within the permit area is shown on Plate 5-2A. There will be no permanent water impoundments within the permit area.

**Landowner, Right-of-Entry, and Public Interest.** Figures 1-1 and 1-2 of Chapter 1 show the boundaries of lands and the names of present owners of record of surface lands and subsurface coal, respectively, included in or contiguous to the permit area. CFC has a legal right to enter and begin coal mining operations on all of the lands within the permit area, as noted in Chapter 1, Section 114 of this M&RP.

Coal mining and reclamation operations will be conducted within 100 feet of the right-of-way line of a public road (an as-yet unnumbered Carbon County road) only where the mine facilities road joins that right-of-way (i.e. at the downstream edge of the disturbed-area boundary).

As noted in Section 534.300, selection of the final alignment of the reconstructed county road will be the responsibility of Carbon County. It is anticipated that the county road will not be significantly realigned within the permit area. During mining and reclamation operations, this road will be used for mine access and coal haulage.

All roads upstream from the sedimentation pond are private roads.

Subsidence from underground mining operations is not projected to affect public lands where dirt roads exist within the permit and adjacent areas (see Section 525.100 of this M&RP).

### **528.200 Overburden**

No overburden will be removed, handled, stored, or transported within the permit area.

### **528.300 Spoil, Coal Processing Waste, Non-Coal Waste, and Mine Development Waste**

**Excess Spoil.** No spoil will be generated at the Dugout Canyon Mine. Sediment removed from the sedimentation pond will be handled in accordance with Section 732.200 of this M&RP.

**Coal Processing Waste.** SCM will not process their coal at the Dugout Canyon Mine beyond crushing and screening. Thus, no coal processing waste will be generated in the permit area.

**Burning and Burned Waste Utilization.** As noted below and in Section 536 of this M&RP, waste rock generated from the Dugout Canyon Mine will be disposed of at permitted facilities located at the SUFCo, Skyline Mines, or other permitted waste rock disposal sites provided the M&RP for those sites will allow for disposal of Dugout Canyon Mine waste rock. If coal mine waste fires occur at the permitted disposal sites, they will be controlled in the manner outlined in their respective permits.

Waste rock will only be temporarily stored at the surface of the Dugout Canyon Mine prior to ultimate disposal or use. If spontaneous combustion of this material does occur, the burning section will be removed from the remainder of the pile using a backhoe or other appropriate means. The affected waste rock will then be spread so that the material can cool and mixed with soil to extinguish the fire. The extinguished material will then be returned to the waste pile.

**Non-Coal Mine Waste.** Non-coal (non-waste rock) waste generated in the permit area will be temporarily stored in a dumpster to be situated at a convenient location within the disturbed

area. This dumpster will be located adjacent to the trailers shown on Plate 5-2A northeast of the coal pile. This waste will be disposed of periodically through Carbon County at a permitted landfill.

Liquid wastes such as oil and solvents will be contained and disposed of or recycled, in accordance with applicable State and Federal regulations, at facilities which are permitted to accept such wastes. Small quantities of such wastes (e.g., resulting from cleanup of small spills, etc.) may be contained onto absorbent pads prior to disposal. In all cases, disposal and/or recycling will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

No non-coal (non-waste rock) waste will be permanently disposed of within the permit area. Non-coal (non-waste rock) waste will be temporarily stored at the site prior to permanent off-site disposal either in a dumpster or in the temporary waste-rock storage area. Off-site disposal will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

It is currently anticipated that no non-coal waste that is defined as hazardous under 40 CFR 261 will be generated at the mine. If such waste is generated in the future, it will be handled in accordance with the requirements of Subtitle C of the Resource Conservation and Recovery Act and any implementing regulations.

**Underground Development Waste.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- At the approved water-rock disposal facility at the SUFCo Mine;
- At the approved waste-rock disposal facility at the Skyline Mine;
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

**Road Maintenance.** The county road will be maintained by Carbon County.

**Road Culverts.** All culverts along the county road will be designed, installed, and maintained by Carbon County. Culverts to be installed within the surface facilities have been designed in accordance with the hydrologic criteria discussed in Section 742.300. These culverts will be installed in accordance with manufacturer's recommendations to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

### **535 Spoil**

No spoil will be generated in the permit area. No valley fills or head-of-hollow fills will be created for the disposal of spoil material. Furthermore, no excess spoil will be disposed of in pre-existing benches.

### **536 Coal Mine Waste**

Coal mine waste resulting from mining activities at the Dugout Canyon Mine will be disposed of at an approved waste-rock disposal facilities such as those operated at the SUFCo Mine or at the Skyline Mine. Both of these are sister operations of SCM. Descriptions of the aforementioned waste-rock disposal facilities are presented in the respective M&RPs.

The coal mine waste generated from the Dugout Canyon Mine may be temporarily stored on the surface of the Dugout Canyon Mine facilities at the location shown on Plate 5-2A prior to ultimate disposal. Coal mine waste which is stored at the mine site will be removed from the temporary waste-rock storage area and placed in its final disposal area at the frequency noted in Section 513.400 of this M&RP. Runoff from the temporary waste-rock storage area will report to the mine-site sedimentation pond and be treated accordingly. During the period of temporary storage, berms will be installed around the temporary storage area to contain and direct runoff to ditch DD-2a (see Plate 7-5). The berms around the temporary waste-rock

storage area are not noted on Plate 7-5 or elsewhere since these will be located as necessary, depending upon the extent of the waste-rock storage.

### **536.100 Design**

The waste-rock disposal facilities at the SUFCo Mine and Skyline Mine were designed to achieve minimum long-term static safety factors of at least 1.5. These designs and the associated evaluations were based on the results of detailed foundation and laboratory analyses of soils at the sites of the disposal facilities.

Due to the temporary nature of the waste-rock storage area shown on Plate 5-2A, the long-term static safety factor of this material has not been evaluated. Foundation conditions beneath the pad on which the waste rock will be temporarily stored are discussed in Chapter 2 and Appendix 5-4 of this M&RP.

### **536.200 Waste Emplacement**

Waste rock from the Dugout Canyon Mine that is to be hauled to the SUFCo, Skyline Mine, or other approved disposal sites will be emplaced in accordance with the respective M&RPs. This waste will be placed in a controlled manner to ensure the mass stability of the waste piles and prevent mass movement during and after construction. The waste rock will be covered periodically to minimize public hazards and the potential for spontaneous combustion.

Waste rock will be emplaced in the temporary storage *areas* at the Dugout Canyon Mine using front-end loaders and other appropriate earth-moving equipment. Due to the temporary nature of this storage, mass movement, public hazards, and spontaneous combustion of the material will not occur prior to its ultimate disposal.

### **536.800 Coal Processing Waste Banks, Dams, and Embankments**

No coal processing waste banks, dams, or embankments will exist within the permit area.

### **536.900 Refuse Piles**

A detailed description of the waste-rock disposal sites at the SUFCo, Skyline Mines, and other potential permitted disposal sites is provided in their respective M&RPs. These M&RPs provide:

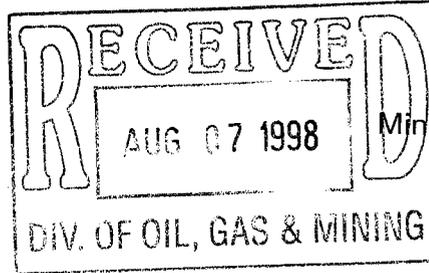
- A description of pre-disturbance soils at the sites;
- Certification of the design and plans;
- Compliance with applicable MSHA regulations;
- A description of proposed inspection activities;
- A description of the design, stability, operation, and reclamation of the waste-rock sites; and
- A discussion of runoff- and sediment-control plans associated with the sites.

The suitability of the waste rock to be generated from the Dugout Canyon Mine for reclamation is discussed in Chapters 2 and 6 of this M&RP.

With respect to the temporary waste-rock disposal area designated on Plate 5-2A, the following information can be found in the indicated sections of this M&RP:

- A description of pre-disturbance soils at the sites - Chapter 2
- A description of the suitability of the waste rock for reclamation - Chapters 2 and 6
- Certification of the design and plans - Section 512

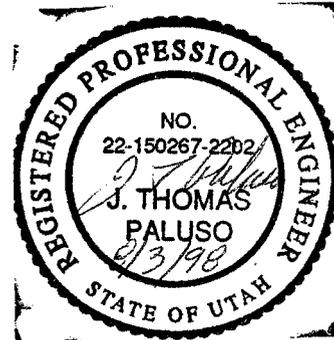
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

**APPENDIX 5-7**

**NEW TEMPORARY WASTE ROCK STORAGE LOCATION INFORMATION**



This appendix includes the following items:

- A description of the material to be stored,
- A brief material handling description,
- Stockpile capacity,
- A cross section of the temporary waste rock pile,
- Chemical analysis of the waste rock to be stored.

The description of the material and material handling plan follows below while the remaining three items are included in the attached pages.

#### Material Description:

The waste rock material consists of shale, siltstone, and sandstone fragments. This material has fallen from the roof of the mine over the past 40 years. The material consists of angular sand, gravel, and cobble size clasts. Acid- and toxic-forming analysis results have been included in the attached pages. As noted on the cross section sheet, the storage volume is 1926 CY.

#### Material Handling:

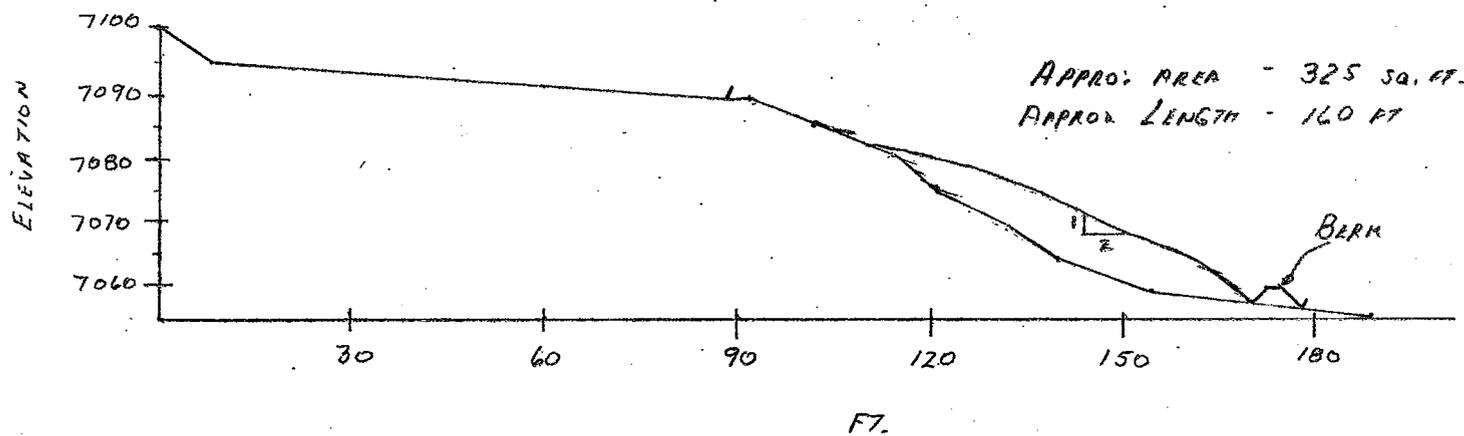
The waste rock will be scooped and loaded underground using underground mining equipment. The waste rock will then be brought to the surface and dumped over the existing pad slope as shown in the attached figure. As waste rock accumulates on and at the base of the slope, appropriate earthmoving equipment will be used to distribute the waste rock within the containment area. This will allow for the maximum storage volume to be achieved and reduce the risk of creating unstable slopes. Every 1000 tons of waste rock removed will be tested for acid- and toxic- forming characteristics after it has been stored at the surface for approximately two weeks. If it is not found to have acid- or toxic-forming characteristics, it may be used for fill during mine site construction activities. It will be placed and compacted as fill following the methods described in the approved M&RP. If the waste rock is found to be unsuitable as fill, it will be transported to either the SUFCo or Skyline Mine waste rock storage areas as approved in the M&RP.



TYPICAL CROSS-SECTION  
TEMPORARY WASTE ROCK  
STORAGE AREA

18 June 1998  
G. Taylor

$$\begin{aligned} \text{VOLUME} &= 325 \text{ SQ. FT.} \times 160 \text{ FT.} / 27 \text{ CU. FT. / CU. YD.} \\ &= 1926 \text{ CU. YD.} \end{aligned}$$



SCALE 1" = 30' H AND V

22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS





Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WBLINGTON, UTAH

August 24, 1995

Page 1 of

Lab No.	Location	Depth feet	pH	EC umhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124887	ROCK CYN ROOF	0.0-0.0	7.8	1.53	24.2	3.49	8.06	4.34	1.81		72.4	20.0	7.6	SANDY LOAM
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124889	COAL	0.0-0.0	8.4	0.97	58.4	0.42	0.46	8.02	12.1		88.4	9.0	2.6	SAND
124890	GILSON ROOF	0.0-0.0	7.5	0.66	28.1	2.34	2.79	0.88	0.55		39.4	41.0	19.6	LOAM
124891	FLOOR	0.0-0.0	7.8	1.58	23.4	3.35	8.76	4.57	1.86		69.4	22.0	8.6	SANDY LOAM
124892	COAL	0.0-0.0	7.2	2.30	56.7	23.2	5.68	0.85	0.22		88.4	8.0	3.6	SAND

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P004/009

TO SKYLINE

06-11-98 12:14PM FROM 801 637 0108



InterMountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

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SOLDIER CREEK COAL COMPANY  
WRELLINGTON, UTAH

August 24, 1995

Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124887	ROCK CYN ROOF	0.0-0.0	3.6	0.17	5.31	181.	176.					
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124889	COAL	0.0-0.0	93.3	0.38	11.9	43.6	31.7					
124890	GILSON ROOF	0.0-0.0	4.9	0.02	0.62	1.74	1.12					
124891	FLOOR	0.0-0.0	4.5	0.09	2.81	173.	171.					
124892	COAL	0.0-0.0	93.3	0.45	14.1	23.8	9.69					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P005/009

TO SKYLINE

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WELLINGTON, UTAH

August 24, 1995

Page 3 of

Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124887	ROCK CYN ROOF	0.0-0.0	1.02	0.28	0.02	0.37	0.26	2.24	0.03	9.6	2.4
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124889	COAL	0.0-0.0	1.22	1.64	<0.02	0.69	0.22	1.30	0.77	9.5	8.1
124890	GILSON ROOF	0.0-0.0	1.20	0.97	0.08	0.28	0.26	8.62	0.04	14.9	4.1
124891	FLOOR	0.0-0.0	1.26	0.28	0.02	0.38	0.27	2.40	0.03	13.7	2.9
124892	COAL	0.0-0.0	1.20	1.77	<0.02	0.39	0.34	1.38	0.74	17.8	7.9

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P006/009

TO SKYLINE

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WELLINGTON, UTAH

August 24, 1995

Page 1 of

Lab No.	Location	Depths feet	pH	EC mmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124894	124888 (DOP)	0.0-0.0	7.8	0.94	35.6	4.18	4.53	0.80	0.38		67.4	23.0	9.6	SANDY LOAM

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CRC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P007/009

TO SKYLINE

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WELLINGTON, UTAH

August 24, 1995

Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124894	124888(DDP)	0.0-0.0	1.6	0.02	0.62	92.0	91.4					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P008/009

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Sheridan, Wyoming 82801

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SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 3 of

Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124894	124888 (DUP)	0.0-0.0	1.04	0.28	<0.02	0.28	0.25	3.54	0.02	14.6	2.8

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P009/009

TO SKYLINE

06-11-98 12:14PM FROM 801 637 0108

Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine

Mining and Reclamation Plan  
August 1998

## **SLOPE STABILITY ANALYSIS**

July 27, 1998



**EarthFax**

Mr. Chris Hansen  
Canyon Fuel Company, LLC  
Skyline Mine  
P.O. Box 719  
Helper, UT 84526

EarthFax  
Engineering Inc.  
Engineers/Scientists  
7324 So. Union Park Ave.  
Suite 100  
Midvale, Utah 84047  
Telephone 801-561-1555  
Fax 801-561-1861

**Subject: Stability of Temporary Waste-Rock Pile  
at the Dugout Canyon Mine**

Dear Chris:

Pursuant to your request, we have evaluated the stability of the temporary waste-rock pile at the Dugout Canyon Mine in Carbon County, Utah. This pile has been created from the sidecast of roof-fall and other rock materials being cleaned from the old Dugout Canyon portals. The material has been sidecast off the old portal pad to an area adjacent to the dirt road which exists at an elevation approximately 20 to 25 feet lower than the pad. This analysis was performed to address the concerns expressed by the Utah Division of Oil, Gas and Mining at a recent site meeting.

A sample of the sidecast waste rock was collected and submitted to Applied Geotechnical Engineering Consultants, Inc. for analyses of the following physical properties:

- Particle-size analysis (ASTM D-422)
- Atterberg limits (ASTM D-4318)
- Direct shear (ASTM D-3080)
- Standard Proctor (ASTM D-698)

Results of these analyses are presented in Attachment A. According to these analyses, the waste rock is coarse-grained, with approximately 95 percent retained on the No. 200 sieve (i.e., sand fraction or larger) and approximately 82 percent being retained on the No. 4 sieve (i.e., gravel fraction). The material has further been classified as poorly-graded, with a Unified Soil Classification of GP-GM. The sample had an internal angle of friction of 35 degrees and a cohesive strength of 490 pounds per square foot.

Slope-stability analyses were performed using the computer program GEOSLOPE (Version 5.0), which is based on the FORTRAN program STABL3, developed at Purdue University. GEOSLOPE utilizes the limit equilibrium procedure of slices (Simplified Bishop's method) to determine the safety factor of potential failure surfaces for circular shapes.

Given the lack of seepage from the pad outslope, the slope-stability analyses were conducted based on unsaturated conditions. The materials were assumed to drain rapidly with no excess pore pressures developing in response to strains and stress changes.

Mr. Chris Hansen  
July 27, 1998  
Page 2

The engineering properties of the pad and other soil materials at the site were obtained from Appendix 5-4 of the Dugout Canyon Mine Phase II Mining and Reclamation Plan. Two conditions were evaluated

- Condition I - failure surfaces were allowed to begin and end in the road and pad areas, outside of the waste rock,
- Condition II - failure surfaces were allowed to begin and end only within the waste rock.

Results of the slope-stability analyses are presented in Attachment B. As indicated, the minimum safety factor for Condition I was determined to be 2.67. The minimum safety factor under Condition II is 2.83. Hence, the waste rock and the adjacent slope are stable.

Please contact me if you have any questions.

Sincerely,



Richard B. White, P.E.  
President

Attachments



Mr. Chris Hansen  
July 27, 1998  
Page 3

**ATTACHMENT A**

Results of Waste-Rock Analyses



Applied Geotechnical Engineering Consultants, Inc.

July 15, 1998

Earthfax Engineering  
7324 South 1300 East, Suite 100  
Midvale, UT 84047

Attention: Richard B. White  
Subject: Soils Laboratory Testing  
AGEC Project No. 973301

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to provide laboratory testing on a sample received July 2, 1998. The following tests have been performed in general accordance with the test method listed.

Test	Test Method
Particle Size Analysis	ASTM D-422
Atterberg Limits	ASTM D-4318
Direct Shear	ASTM D-3080
Standard Proctor	ASTM D-698

The results of the laboratory testing are shown graphically in Figures 1-2. The direct shear test specimens were remolded to approximately 90% of the standard proctor maximum dry density near optimum moisture content. Only material passing the #4 sieve was used in direct shear testing.

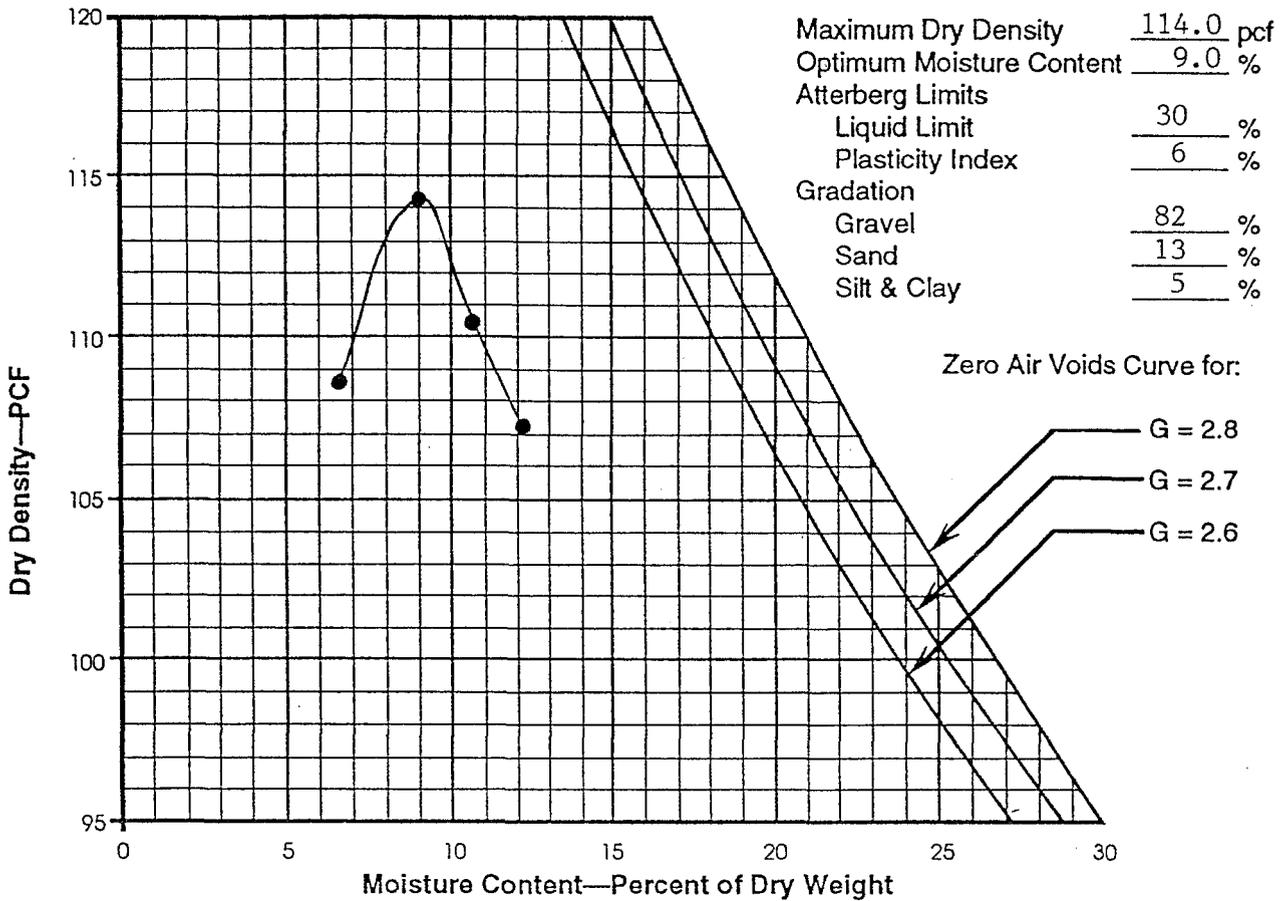
If you have any questions, or if we can be of further service, please call.

Sincerely,

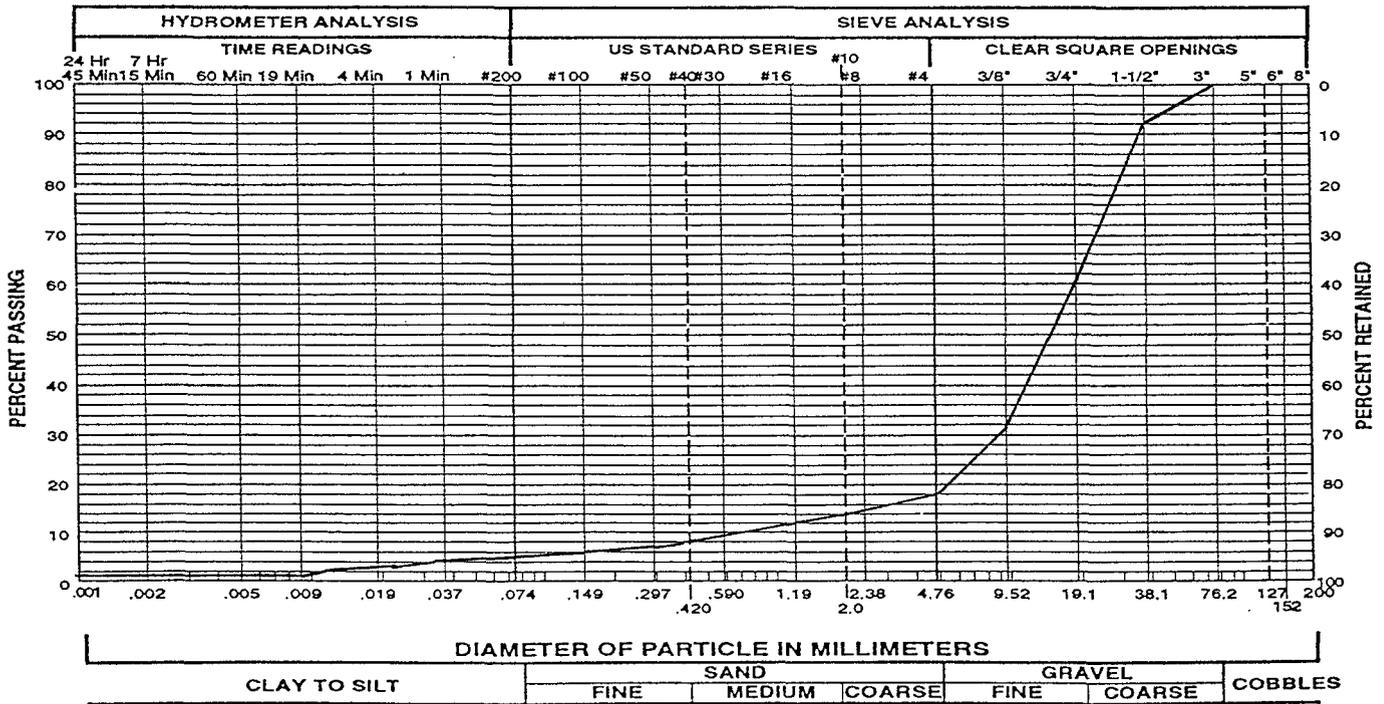
APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

*Stephanie Francom*  
Stephanie Francom  
Rev. SDA, E.I.T.

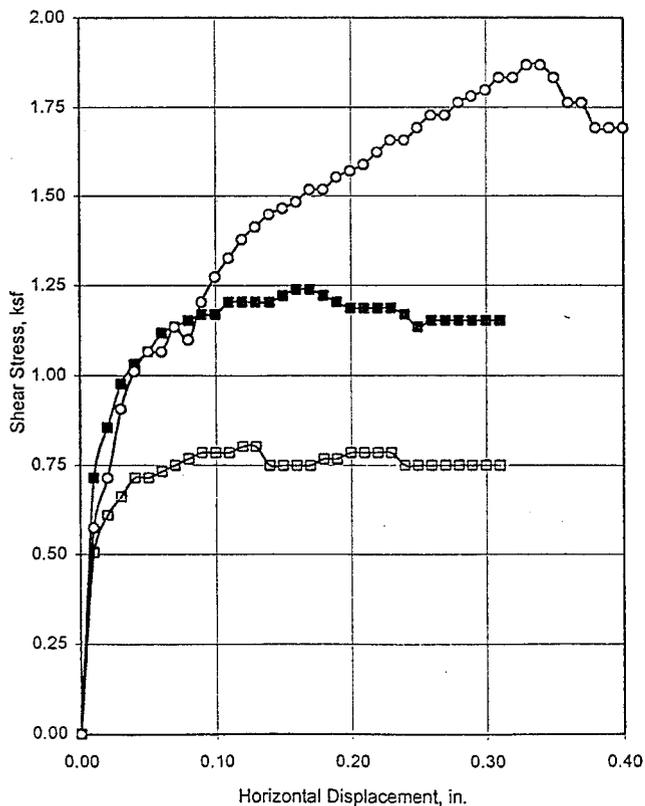
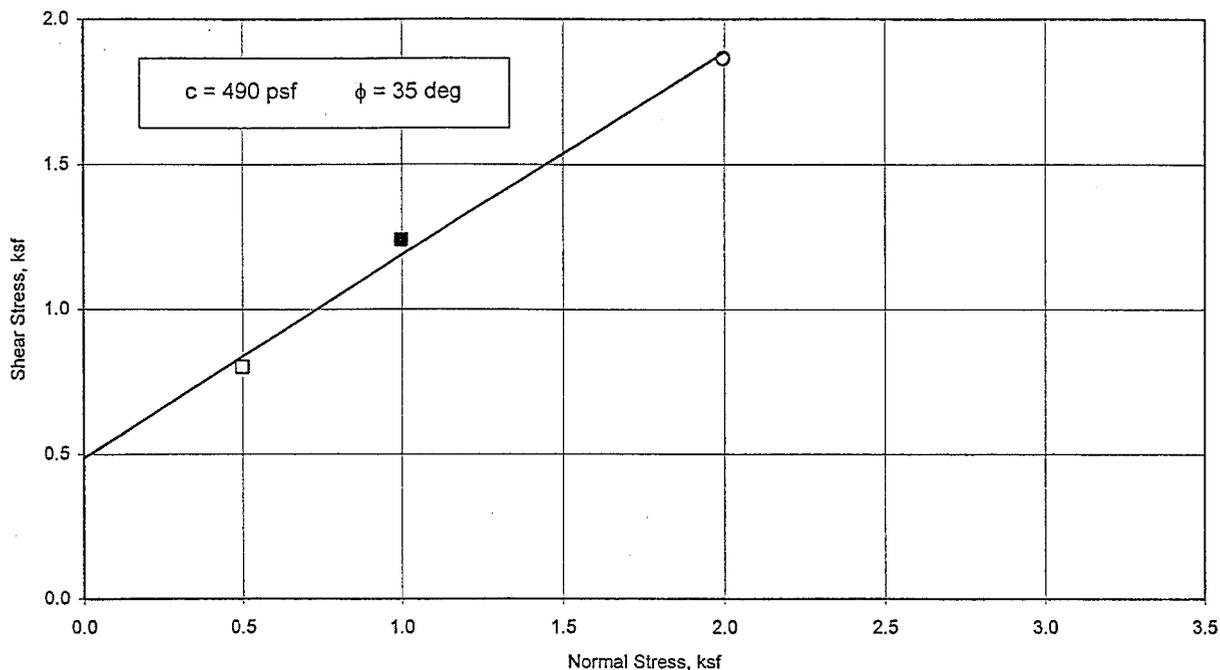
# Applied Geotechnical Engineering Consultants, Inc.



Compaction Test Procedure ASTM D-698 Method D  
 Sample of: Poorly-Graded Gravel with Silt (GP-GM) From: DCM-1 (7/6/98)



# Applied Geotechnical Engineering Consultants, Inc.



Test No. (Symbol)	1(□)	2(■)	3(O)
Sample Type	Remolded		
Length, in.	0.75	0.75	0.75
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	112	112	112
Moisture Content, %	9	9	9
Consolidation Load, ksf	0.5	1.0	2.0
Normal Load, ksf	0.5	1.0	2.0
Shear Stress, ksf	0.80	1.24	1.87
Remarks	Strain Rate 0.05 in/min. Only soil passing the #4 sieve was used in test.		

Sample Index Properties	
Dry Density, pcf	N/A
Moisture Content, %	N/A
Liquid Limit, %	30
Plasticity Index, %	6
Percent Gravel	82
Percent Sand	13
Percent Passing No. 200 Sieve	5

Type of Test     Consolidated Undrained/Saturated  
 Sample Description     Poorly Graded Gravel with Silt (GP-GM)     From     DCM-1

Project No.     973301

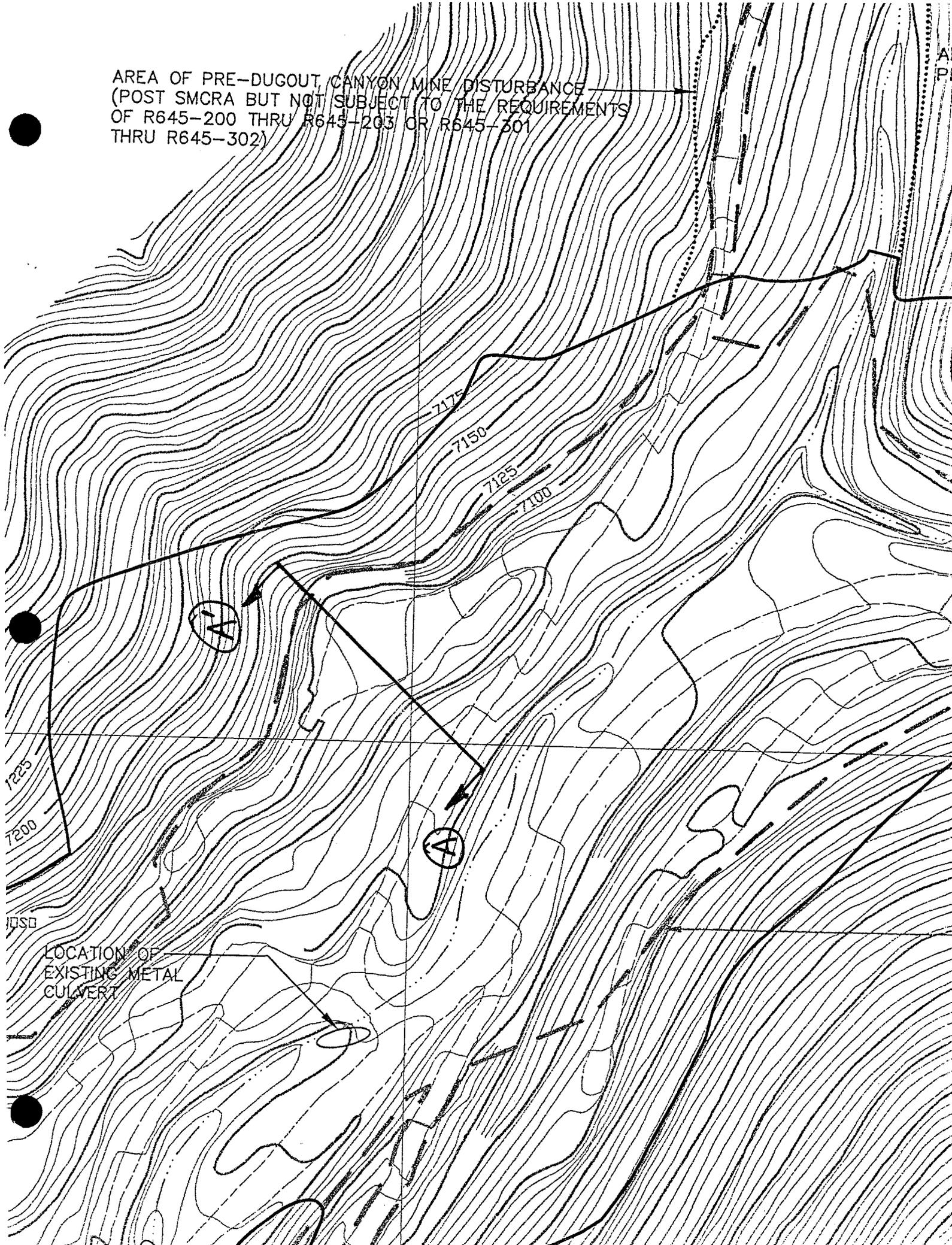
## DIRECT SHEAR TEST RESULTS

Figure     2

**ATTACHMENT B**

Results of Slope-Stability Analyses

AREA OF PRE-DUGOUT CANYON MINE DISTURBANCE  
(POST SMCRA BUT NOT SUBJECT TO THE REQUIREMENTS  
OF R645-200 THRU R645-203 OR R645-301  
THRU R645-302)



LOCATION OF  
EXISTING METAL  
CULVERT

GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY — *Failure surfaces can begin and end outside of the waste rock*

Remarks :

#### INPUT DATA

##### Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

##### Soil Parameters

Number of Soil Types : 2

#### TRIAL SURFACE GENERATION

##### Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 30.00 ft  
Right Initiation Point : 69.00 ft  
Left Termination Point : 70.00 ft  
Right Termination Point : 120.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

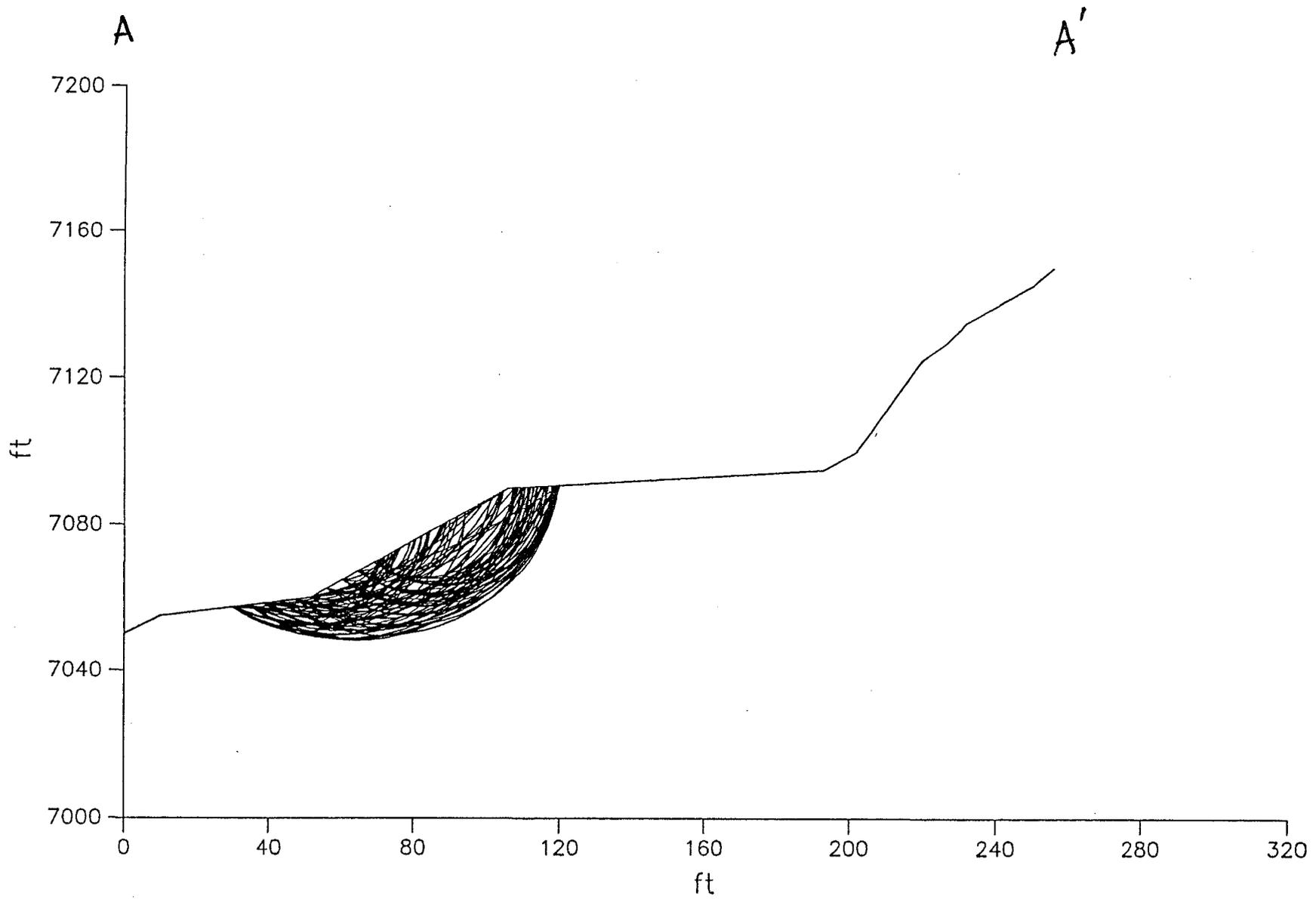
#### RESULTS

##### Critical Surface

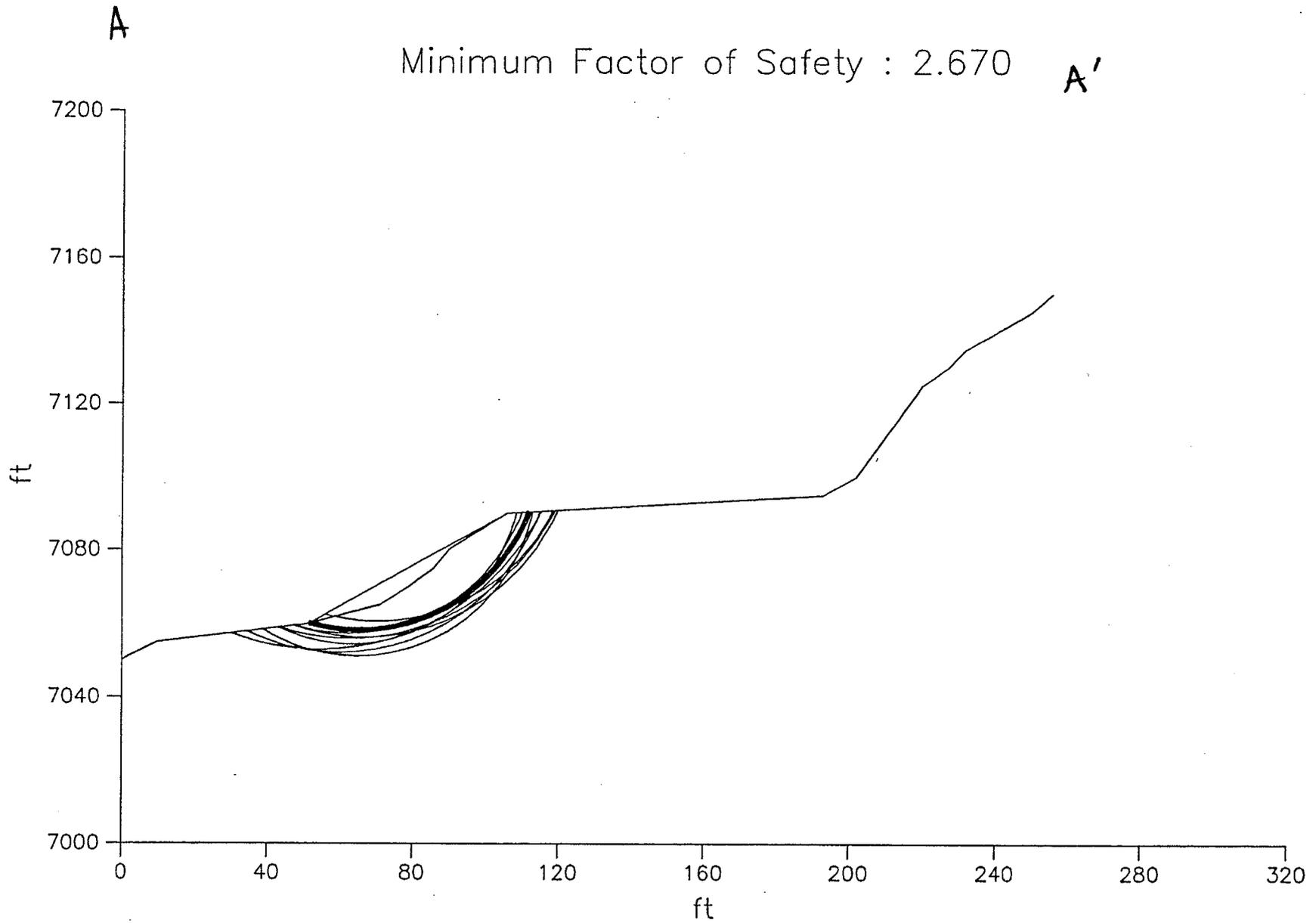
Factor of Safety : 2.670

□

# Circular Surfaces – Search for Critical Surfaces



Circular Surfaces – Most Critical Surfaces



GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY -

Remarks : Failure surfaces can begin and end  
in the waste rock only

INPUT DATA

Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

Soil Parameters

Number of Soil Types : 2

TRIAL SURFACE GENERATION

Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 51.50 ft  
Right Initiation Point : 71.50 ft  
Left Termination Point : 86.00 ft  
Right Termination Point : 106.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

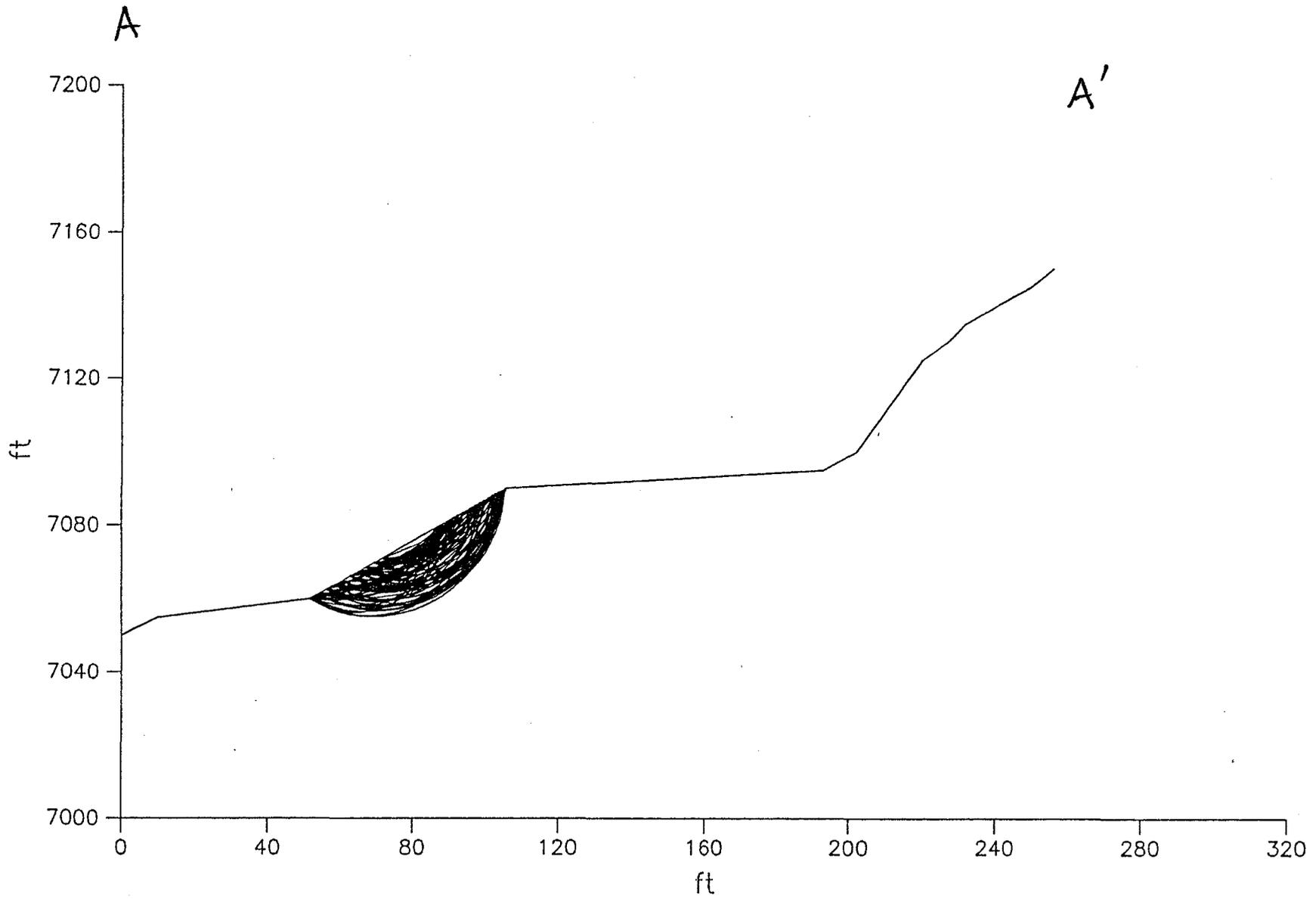
RESULTS

Critical Surface

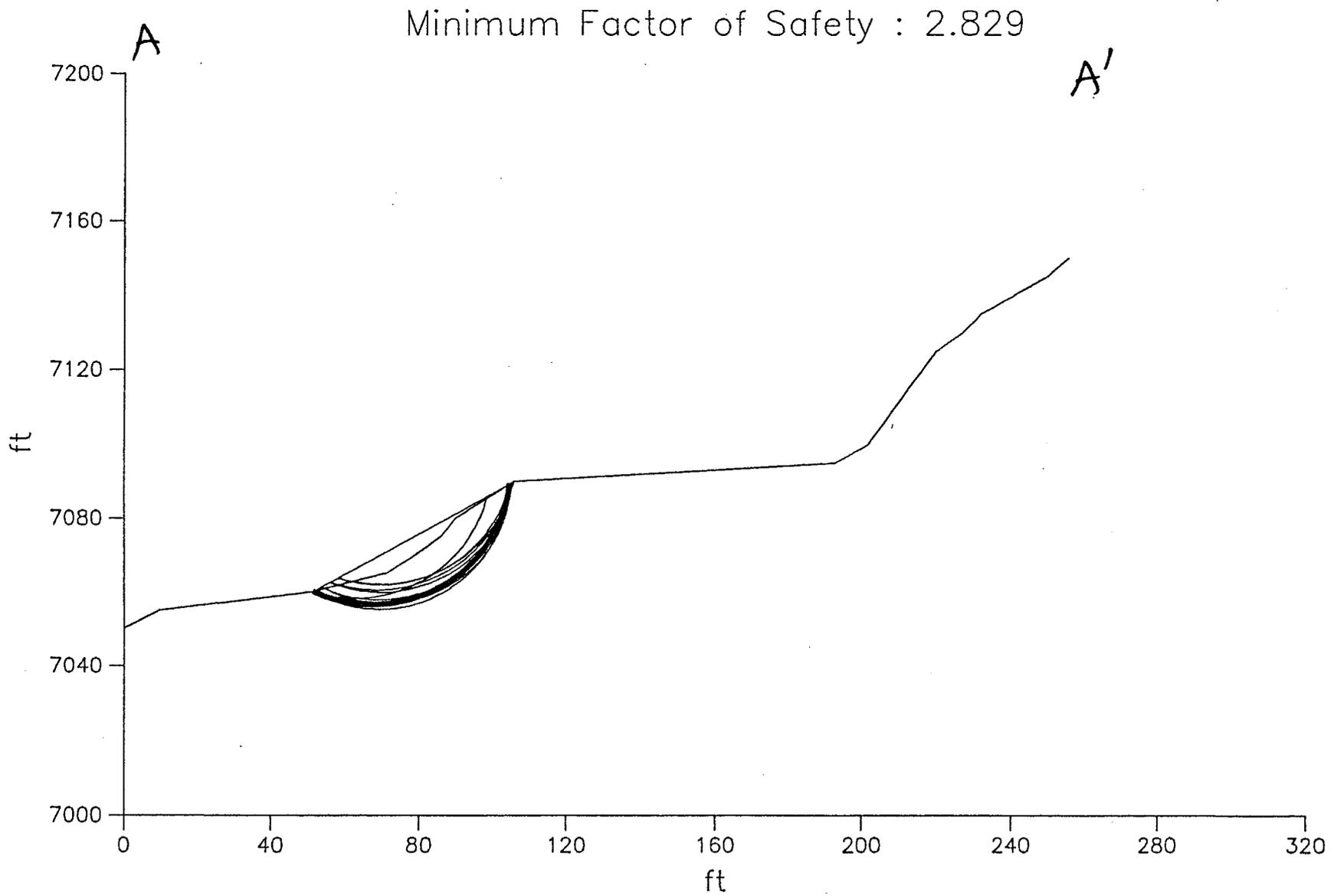
Factor of Safety : 2.829

□

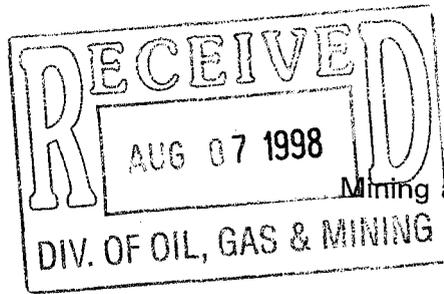
Circular Surfaces – Search for Critical Surfaces



Circular Surfaces – Most Critical Surfaces



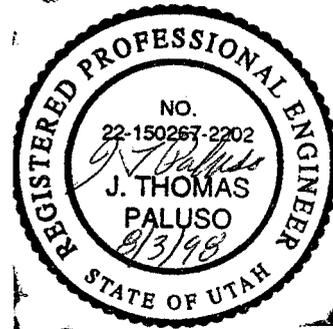
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

APPENDIX 7-12

NEW TEMPORARY WASTE ROCK STORAGE DIVERSION STRUCTURES



This appendix includes a figure illustrating the new temporary waste rock storage area, containment berm, silt fence locations, and surface runoff flow direction in the storage area and calculations supporting the design of the berms for a 100-year 6-hour storm event that produces 2.05 inches of precipitation. Silt fences are located down gradient of the storage area as shown on the attached figure to treat runoff from the berm and road.

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

RUNOFF FROM MINE WASTE ROCK PILE

by

Name: Gary E. Taylor

Company Name: CANYON FUEL CO., SKYLINE MINE  
File Name: C:\SEDCAD3\SP0IL

Date: 06-15-1998

Civil Software Design -- SEDCAD+ Version 3.1  
Copyright (C) 1987-1992. Pamela J. Schwab. All rights reserved.

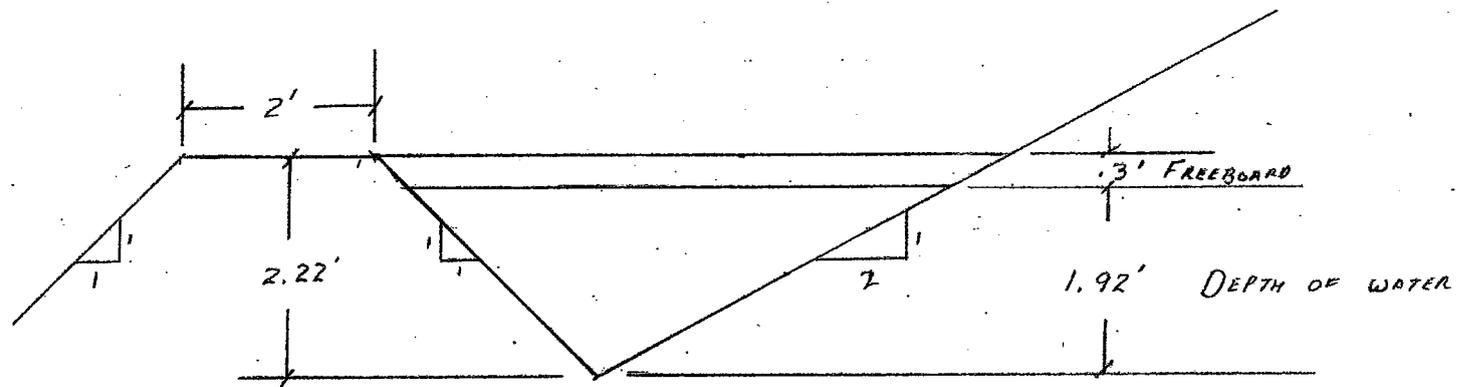
Company Name: CANYON FUEL CO., SKYLINE MINE  
Filename: C:\SEDCAD3\SPOIL User: Gary E. Taylor  
Date: 06-15-1998 Time: 15:41:04  
Runoff from Mine Waste Rock Pile  
Storm: 2.05 inches, 100 year- 6 hour, SCS Type II  
Hydrograph Convolution Interval: 1.0 hr

=====  
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE  
=====

-Hydrology-

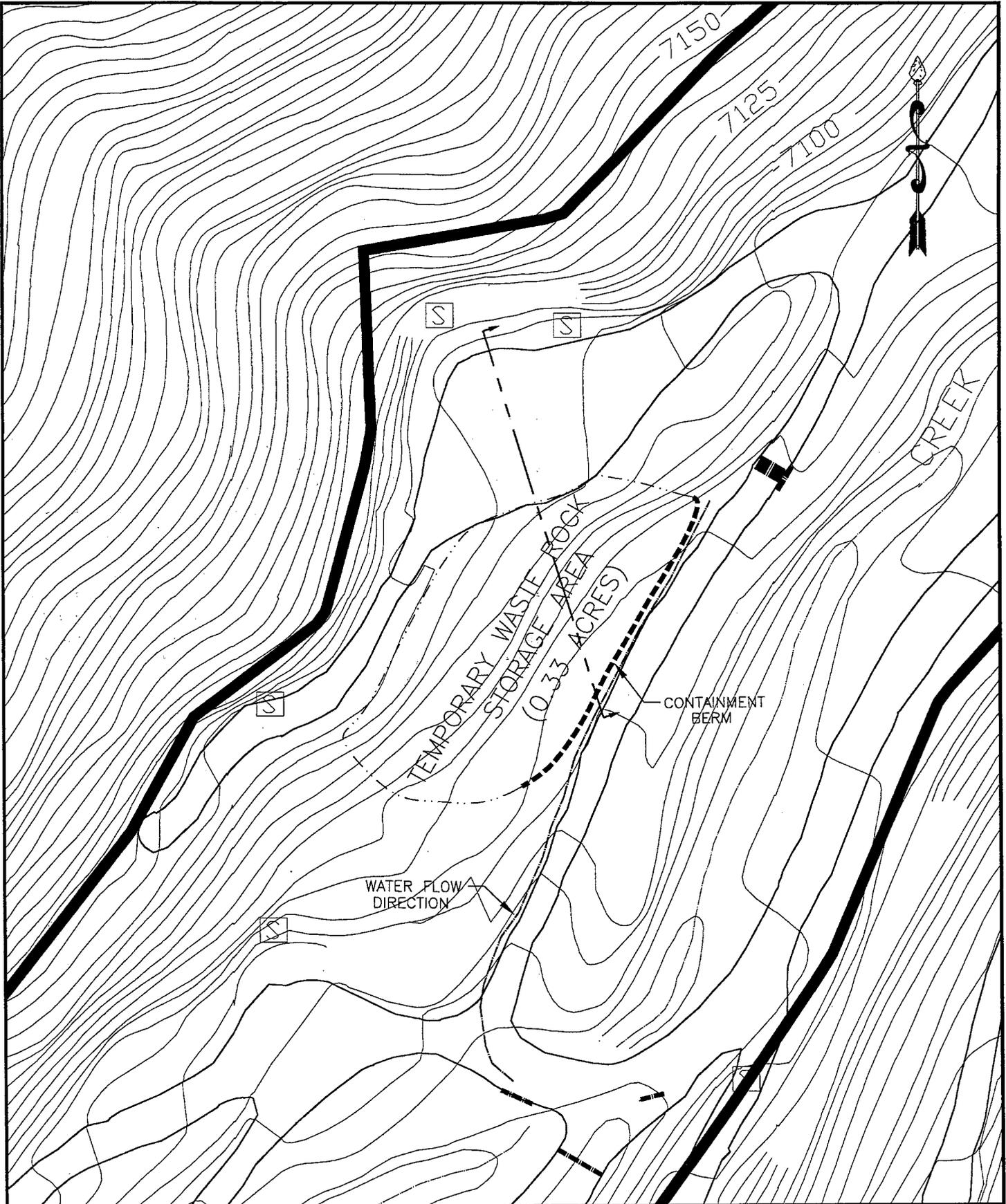
JBS SWS	Area (ac)	CN UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111 1	0.33	85 M	0.030	0.000	0.000	0.0	0.02	0.44
		Type: Null	Label: spoil					
111 Structure	0.33						0.02	
111 Total IN/OUT	0.33						0.02	0.44

TYPICAL CROSS-SECTION  
OF CONTAINMENT AREA



22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS





- LEGEND**
- SILT FENCE
  - BROAD SWALE
  - DISTURBED AREA BOUNDARY

REVISIONS OR UP-DATES			DATE:
NO.	DATE	BY	6-18-98
			DESIGNED BY: C. HANSEN
			DRAWN BY: G. TAYLOR
			CHECKED BY: C. HANSEN
			SCALE:
FILENAME: F:\conf\jackson\waste.dwg			

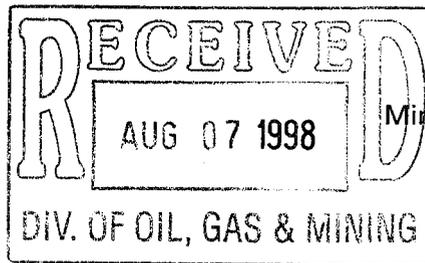
**CF** Canyon Fuel Company, LLC  
Soldier Canyon Mine

**TEMPORARY WASTE ROCK STORAGE AREA**

P.O. BOX 1028  
WELLINGTON, UTAH 84542

DRAWING OR MAP NUMBER  
ACT/007/039

Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

**Surface Facilities.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of :

- At the approved waste-rock disposal facility at the SUFCo Mine (a sister operation of SCM);
- At the approved waste-rock disposal facility at the Skyline Mine (also a sister operation of SCM); or
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

Copies of the Division correspondence approving the SUFCo and Skyline waste-rock disposal facilities for receipt of Dugout Canyon waste rock are provided in Appendix 5-2.

Certified maps and cross sections concerning the disposal of underground development waste at the SUFCo and Skyline Mines are provided in the respective Mining and Reclamation Plans (M&RPs) for those mines. A certified map showing the proposed location of non-coal (non-waste rock) waste storage, coal storage and loading areas, and explosive storage and handling facilities, is provided as Plate 5-2A. Cross sections of the proposed facilities area are provided on Plate 5-2B. A location map, cross section, material description, volume calculation, and slope stability analysis for a temporary waste rock storage area to be utilized during site construction is included in Appendix 5-7.

A map of the existing topography prior to disturbance by SCM is provided as Plate 5-2C. Also noted on Plate 5-2C is the area of disturbance which was mapped to exist at the site in 1980. Since mining ceased at the site in 1964 (as noted earlier in this section), this boundary represents the area of pre-SMCRA disturbance. Plate 5-2C also shows areas of non-mining disturbance which occurred after 1980 but prior to 1996. These disturbances were created by logging activities in the area and are not subject to the requirements of R645-301 through R645-302. No areas shown on Plate 5-2C are subject to the requirements of R645-200 through R645-203.

A certified map showing the location of the topsoil stockpile is provided as Plate 2-3.

The proposed location of the sedimentation pond is noted on Plate 5-2A. No water treatment facilities will exist at the site other than the sewage leach field and the sedimentation pond.

The following facilities or activities will not exist or occur within the permit area:

- Coal preparation plant,
- Coal cleaning,
- Coal processing waste banks, dams, or embankments,
- Disposal of non-coal (non-waste rock) waste other than durable rock-type construction materials such as cinder block, and
- Air pollution control facilities.

Hence, certified maps or cross sections of these facilities are not provided in this plan. The durable rock-type construction materials will be disposed of in locations designated to receive underground development waste (i.e., at the approved waste-rock disposal facilities).

**Surface Configurations.** Certified maps and cross sections showing the proposed final (post-reclamation) surface configuration of the Dugout Canyon disturbed area are provided on Plates 5-3 and 5-4.

**Hydrology.** Certified maps and cross sections associated with the hydrology of the Dugout Canyon Mine area are provided in Chapter 7.

**Geology.** Certified maps and cross sections associated with the geology of the Dugout Canyon Mine area are provided in Chapter 6.

### **513 Compliance with MSHA Regulations and MSHA Approvals**

#### **513.100 Coal Processing Waste Dams and Embankments**

No coal processing waste dams or embankments will exist within the permit area.

#### **513.200 Impoundments and Sedimentation Ponds**

No impoundments or sedimentation ponds in the permit area will meet the size criteria of 30 CFR 77.216(a).

#### **513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil**

No coal processing waste or excess spoil will be generated within the permit area. It is not anticipated that underground development waste will be disposed of in underground mine workings.

#### **513.400 Refuse Piles**

Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A and the map in Appendix 5-7. This storage will be for a short period of time prior to ultimate disposal in the waste-rock disposal areas associated with the SUFCo, Skyline Mines and/or other permitted and approved sites. Waste rock will be disposed of after approximately 1500 CY of material accumulates or every 4 months, whichever is shorter. Runoff from the stored materials will drain to the site sedimentation pond or appropriate sediment control structures.

### **513.500 Underground Openings to the Surface**

Upon abandonment, each opening to the surface from the underground will be capped, sealed, backfilled, or otherwise properly managed in accordance with 30 CFR 75.1771. Details regarding final abandonment of mine openings are provided in Section 542.700.

### **513.600 Discharges to Underground Mines**

No discharges will occur from the surface to underground mine workings in the permit area.

### **513.700 Surface Coal Mining and Reclamation Activities**

No surface coal mining and reclamation activities will occur in the permit area.

### **513.800 Coal Mine Waste Fires**

If any coal mine waste fires occur within the permit area, these will be reported immediately to MSHA and the Division. Immediate remedial action will be taken as deemed necessary by SCM to protect public health and safety as well as the environment. Following initial remedial efforts, a long-term plan will be formulated in discussion with MSHA and the Division to extinguish any existing fires and prevent future fires.

SCM will utilize a program of prevention and suppression to minimize the potential for coal mine waste fires. An ongoing educational program will emphasize the need for attention to fire prevention. Prevention will be further enhanced by the short-term nature of the storage at the Dugout Canyon Mine. Suppression will occur by separating smoldering material and compacting the adjacent material (to minimize oxygen content in the adjacent material). The burning material will then be extinguished using appropriate methods (see Section 528.300

of this M&RP). No burning mine waste will be removed from the temporary storage area without a removal plan approved by the Division.

## **514 Inspections**

### **514.100 Excess Spoil**

Excess spoil will not be generated at the Dugout Canyon Mine.

### **514.200 Refuse Piles**

The frequency and methods of inspections of the waste-rock areas at the SUFCo and Skyline Mines is discussed in their respective M&RPs. Quarterly inspections will be made of the temporary waste-rock storage area at the mine site (see Plate 5-2A). These inspections will be performed by a professional engineer or a specialist experienced in the construction of similar earth and waste structures. The inspector will provide a certified report to the Division within two weeks after each inspection. The report will discuss any appearances of instability, structural weakness, or other hazardous conditions. A copy of this report will also be maintained at the mine site.

All activities performed at this area will be in accordance with the applicable MSHA permit.

### **514.300 Impoundments**

Regular inspections will be made during construction of the sedimentation pond and other impoundments as well as upon completion of construction. These inspections will be made

Plates 4-1 and 5-2A depict the location of an existing UP&L distribution line that will be improved and activated to provide electrical service to the mine. This distribution line, which is not classified as a major electric transmission line, will be owned and upgraded by UP&L.

As noted previously, waste rock which is generated at the Dugout Canyon Mine will be disposed of in the approved waste-rock disposal areas at the SUFCo and/or Skyline Mines.

The location of the sedimentation pond within the permit area is shown on Plate 5-2A. There will be no permanent water impoundments within the permit area.

**Landowner, Right-of-Entry, and Public Interest.** Figures 1-1 and 1-2 of Chapter 1 show the boundaries of lands and the names of present owners of record of surface lands and subsurface coal, respectively, included in or contiguous to the permit area. CFC has a legal right to enter and begin coal mining operations on all of the lands within the permit area, as noted in Chapter 1, Section 114 of this M&RP.

Coal mining and reclamation operations will be conducted within 100 feet of the right-of-way line of a public road (an as-yet unnumbered Carbon County road) only where the mine facilities road joins that right-of-way (i.e. at the downstream edge of the disturbed-area boundary).

As noted in Section 534.300, selection of the final alignment of the reconstructed county road will be the responsibility of Carbon County. It is anticipated that the county road will not be significantly realigned within the permit area. During mining and reclamation operations, this road will be used for mine access and coal haulage.

All roads upstream from the sedimentation pond are private roads.

Subsidence from underground mining operations is not projected to affect public lands where dirt roads exist within the permit and adjacent areas (see Section 525.100 of this M&RP).

### **528.200 Overburden**

No overburden will be removed, handled, stored, or transported within the permit area.

### **528.300 Spoil, Coal Processing Waste, Non-Coal Waste, and Mine Development Waste**

**Excess Spoil.** No spoil will be generated at the Dugout Canyon Mine. Sediment removed from the sedimentation pond will be handled in accordance with Section 732.200 of this M&RP.

**Coal Processing Waste.** SCM will not process their coal at the Dugout Canyon Mine beyond crushing and screening. Thus, no coal processing waste will be generated in the permit area.

**Burning and Burned Waste Utilization.** As noted below and in Section 536 of this M&RP, waste rock generated from the Dugout Canyon Mine will be disposed of at permitted facilities located at the SUFCo, Skyline Mines, or other permitted waste rock disposal sites provided the M&RP for those sites will allow for disposal of Dugout Canyon Mine waste rock. If coal mine waste fires occur at the permitted disposal sites, they will be controlled in the manner outlined in their respective permits.

Waste rock will only be temporarily stored at the surface of the Dugout Canyon Mine prior to ultimate disposal or use. If spontaneous combustion of this material does occur, the burning section will be removed from the remainder of the pile using a backhoe or other appropriate means. The affected waste rock will then be spread so that the material can cool and mixed with soil to extinguish the fire. The extinguished material will then be returned to the waste pile.

**Non-Coal Mine Waste.** Non-coal (non-waste rock) waste generated in the permit area will be temporarily stored in a dumpster to be situated at a convenient location within the disturbed

area. This dumpster will be located adjacent to the trailers shown on Plate 5-2A northeast of the coal pile. This waste will be disposed of periodically through Carbon County at a permitted landfill.

Liquid wastes such as oil and solvents will be contained and disposed of or recycled, in accordance with applicable State and Federal regulations, at facilities which are permitted to accept such wastes. Small quantities of such wastes (e.g., resulting from cleanup of small spills, etc.) may be contained onto absorbent pads prior to disposal. In all cases, disposal and/or recycling will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

No non-coal (non-waste rock) waste will be permanently disposed of within the permit area. Non-coal (non-waste rock) waste will be temporarily stored at the site prior to permanent off-site disposal either in a dumpster or in the temporary waste-rock storage area. Off-site disposal will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

It is currently anticipated that no non-coal waste that is defined as hazardous under 40 CFR 261 will be generated at the mine. If such waste is generated in the future, it will be handled in accordance with the requirements of Subtitle C of the Resource Conservation and Recovery Act and any implementing regulations.

**Underground Development Waste.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- At the approved water-rock disposal facility at the SUFCo Mine;
- At the approved waste-rock disposal facility at the Skyline Mine;
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

**Road Maintenance.** The county road will be maintained by Carbon County.

**Road Culverts.** All culverts along the county road will be designed, installed, and maintained by Carbon County. Culverts to be installed within the surface facilities have been designed in accordance with the hydrologic criteria discussed in Section 742.300. These culverts will be installed in accordance with manufacturer's recommendations to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

### **535 Spoil**

No spoil will be generated in the permit area. No valley fills or head-of-hollow fills will be created for the disposal of spoil material. Furthermore, no excess spoil will be disposed of in pre-existing benches.

### **536 Coal Mine Waste**

Coal mine waste resulting from mining activities at the Dugout Canyon Mine will be disposed of at an approved waste-rock disposal facilities such as those operated at the SUFCo Mine or at the Skyline Mine. Both of these are sister operations of SCM. Descriptions of the aforementioned waste-rock disposal facilities are presented in the respective M&RPs.

The coal mine waste generated from the Dugout Canyon Mine may be temporarily stored on the surface of the Dugout Canyon Mine facilities at the location shown on Plate 5-2A prior to ultimate disposal. Coal mine waste which is stored at the mine site will be removed from the temporary waste-rock storage area and placed in its final disposal area at the frequency noted in Section 513.400 of this M&RP. Runoff from the temporary waste-rock storage area will report to the mine-site sedimentation pond and be treated accordingly. During the period of temporary storage, berms will be installed around the temporary storage area to contain and direct runoff to ditch DD-2a (see Plate 7-5). The berms around the temporary waste-rock

storage area are not noted on Plate 7-5 or elsewhere since these will be located as necessary, depending upon the extent of the waste-rock storage.

### **536.100 Design**

The waste-rock disposal facilities at the SUFCo Mine and Skyline Mine were designed to achieve minimum long-term static safety factors of at least 1.5. These designs and the associated evaluations were based on the results of detailed foundation and laboratory analyses of soils at the sites of the disposal facilities.

Due to the temporary nature of the waste-rock storage area shown on Plate 5-2A, the long-term static safety factor of this material has not been evaluated. Foundation conditions beneath the pad on which the waste rock will be temporarily stored are discussed in Chapter 2 and Appendix 5-4 of this M&RP.

### **536.200 Waste Emplacement**

Waste rock from the Dugout Canyon Mine that is to be hauled to the SUFCo, Skyline Mine, or other approved disposal sites will be emplaced in accordance with the respective M&RPs. This waste will be placed in a controlled manner to ensure the mass stability of the waste piles and prevent mass movement during and after construction. The waste rock will be covered periodically to minimize public hazards and the potential for spontaneous combustion.

Waste rock will be emplaced in the temporary storage *areas* at the Dugout Canyon Mine using front-end loaders and other appropriate earth-moving equipment. Due to the temporary nature of this storage, mass movement, public hazards, and spontaneous combustion of the material will not occur prior to its ultimate disposal.

### **536.800 Coal Processing Waste Banks, Dams, and Embankments**

No coal processing waste banks, dams, or embankments will exist within the permit area.

### **536.900 Refuse Piles**

A detailed description of the waste-rock disposal sites at the SUFCo, Skyline Mines, and other potential permitted disposal sites is provided in their respective M&RPs. These M&RPs provide:

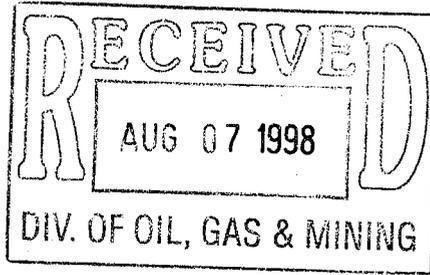
- A description of pre-disturbance soils at the sites;
- Certification of the design and plans;
- Compliance with applicable MSHA regulations;
- A description of proposed inspection activities;
- A description of the design, stability, operation, and reclamation of the waste-rock sites; and
- A discussion of runoff- and sediment-control plans associated with the sites.

The suitability of the waste rock to be generated from the Dugout Canyon Mine for reclamation is discussed in Chapters 2 and 6 of this M&RP.

With respect to the temporary waste-rock disposal area designated on Plate 5-2A, the following information can be found in the indicated sections of this M&RP:

- A description of pre-disturbance soils at the sites - Chapter 2
- A description of the suitability of the waste rock for reclamation - Chapters 2 and 6
- Certification of the design and plans - Section 512

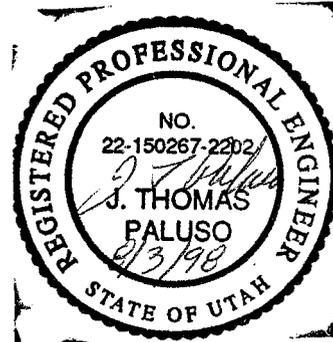
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

**APPENDIX 5-7**

NEW TEMPORARY WASTE ROCK STORAGE LOCATION INFORMATION



This appendix includes the following items:

- A description of the material to be stored,
- A brief material handling description,
- Stockpile capacity,
- A cross section of the temporary waste rock pile,
- Chemical analysis of the waste rock to be stored.

The description of the material and material handling plan follows below while the remaining three items are included in the attached pages.

#### Material Description:

The waste rock material consists of shale, siltstone, and sandstone fragments. This material has fallen from the roof of the mine over the past 40 years. The material consists of angular sand, gravel, and cobble size clasts. Acid- and toxic-forming analysis results have been included in the attached pages. As noted on the cross section sheet, the storage volume is 1926 CY.

#### Material Handling:

The waste rock will be scooped and loaded underground using underground mining equipment. The waste rock will then be brought to the surface and dumped over the existing pad slope as shown in the attached figure. As waste rock accumulates on and at the base of the slope, appropriate earthmoving equipment will be used to distribute the waste rock within the containment area. This will allow for the maximum storage volume to be achieved and reduce the risk of creating unstable slopes. Every 1000 tons of waste rock removed will be tested for acid- and toxic- forming characteristics after it has been stored at the surface for approximately two weeks. If it is not found to have acid- or toxic-forming characteristics, it may be used for fill during mine site construction activities. It will be placed and compacted as fill following the methods described in the approved M&RP. If the waste rock is found to be unsuitable as fill, it will be transported to either the SUFCo or Skyline Mine waste rock storage areas as approved in the M&RP.

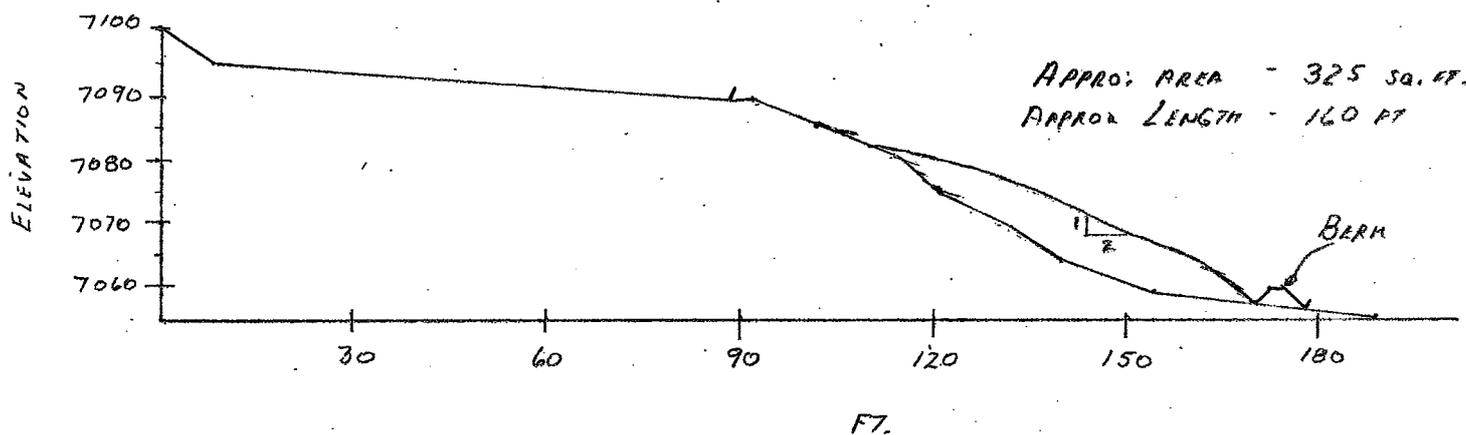


TYPICAL CROSS-SECTION  
 TEMPORARY WASTE ROCK  
 STORAGE AREA

10 June 1998  
 G. TAYLOR

$$\text{VOLUME} = 325 \text{ SQ. FT.} \times 160 \text{ FT.} / 27 \text{ CU. FT./CU. YD.}$$

$$= 1926 \text{ CU. YD.}$$



SCALE 1" = 30' H AND V

22-141 50 SHEETS  
 22-142 100 SHEETS  
 22-144 200 SHEETS





Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 1 of

Lab No.	Location	Depth feet	pH	EC mmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124887	ROCK CYN ROOF	0.0-0.0	7.8	1.53	24.2	3.49	8.06	4.34	1.81		72.4	20.0	7.6	SANDY LOAM
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124889	COAL	0.0-0.0	8.4	0.97	58.4	0.42	0.46	8.02	12.1		88.4	9.0	2.6	SAND
124890	GILSON ROOF	0.0-0.0	7.5	0.66	28.1	2.34	2.79	0.88	0.55		39.4	41.0	19.6	LOAM
124891	FLOOR	0.0-0.0	7.8	1.58	23.4	3.35	8.76	4.57	1.86		69.4	22.0	8.6	SANDY LOAM
124892	COAL	0.0-0.0	7.2	2.30	56.7	23.2	5.68	0.85	0.22		88.4	8.0	3.6	SAND

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P004/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM



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WRLINGTON, UTAH

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Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124887	ROCK CYN ROOF	0.0-0.0	3.6	0.17	5.31	181.	176.					
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124889	COAL	0.0-0.0	93.3	0.38	11.9	43.6	31.7					
124890	GILSON ROOF	0.0-0.0	4.9	0.02	0.62	1.74	1.12					
124891	FLOOR	0.0-0.0	4.5	0.09	2.81	173.	171.					
124892	COAL	0.0-0.0	93.3	0.45	14.1	23.8	9.69					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P005/009

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Page 3 of

Lab No.	Location	Depth feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124887	ROCK CYN ROOF	0.0-0.0	1.02	0.28	0.02	0.37	0.26	2.24	0.03	9.6	2.4
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124889	COAL	0.0-0.0	1.22	1.64	<0.02	0.69	0.22	1.30	0.77	9.5	8.1
124890	GILSON ROOF	0.0-0.0	1.20	0.97	0.08	0.28	0.26	8.62	0.04	14.9	4.1
124891	FLOOR	0.0-0.0	1.26	0.28	0.02	0.38	0.27	2.40	0.03	13.7	2.9
124892	COAL	0.0-0.0	1.20	1.77	<0.02	0.39	0.34	1.38	0.74	17.8	7.9

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P006/009

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Page 1 of

Lab No.	Location	Depths feet	pH	EC umhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124894	124888 (DUP)	0.0-0.0	7.8	0.94	35.6	4.18	4.53	0.80	0.38		67.4	23.0	9.6	SANDY LOAM

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P007/009

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Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124894	124888(DDP)	0.0-0.0	1.6	0.02	0.62	92.0	91.4					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P008/009

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August 24, 1995

Page 3 of

Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124894	124888 (DUP)	0.0-0.0	1.04	0.28	<0.02	0.28	0.25	3.54	0.02	14.6	2.8

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P009/009

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Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine

Mining and Reclamation Plan  
August 1998

## **SLOPE STABILITY ANALYSIS**

July 27, 1998



**EarthFax**

Mr. Chris Hansen  
Canyon Fuel Company, LLC  
Skyline Mine  
P.O. Box 719  
Helper, UT 84526

EarthFax  
Engineering Inc.  
Engineers/Scientists  
7324 So. Union Park Ave.  
Suite 100  
Midvale, Utah 84047  
Telephone 801-561-1555  
Fax 801-561-1861

**Subject: Stability of Temporary Waste-Rock Pile  
at the Dugout Canyon Mine**

Dear Chris:

Pursuant to your request, we have evaluated the stability of the temporary waste-rock pile at the Dugout Canyon Mine in Carbon County, Utah. This pile has been created from the sidecast of roof-fall and other rock materials being cleaned from the old Dugout Canyon portals. The material has been sidecast off the old portal pad to an area adjacent to the dirt road which exists at an elevation approximately 20 to 25 feet lower than the pad. This analysis was performed to address the concerns expressed by the Utah Division of Oil, Gas and Mining at a recent site meeting.

A sample of the sidecast waste rock was collected and submitted to Applied Geotechnical Engineering Consultants, Inc. for analyses of the following physical properties:

- Particle-size analysis (ASTM D-422)
- Atterberg limits (ASTM D-4318)
- Direct shear (ASTM D-3080)
- Standard Proctor (ASTM D-698)

Results of these analyses are presented in Attachment A. According to these analyses, the waste rock is coarse-grained, with approximately 95 percent retained on the No. 200 sieve (i.e., sand fraction or larger) and approximately 82 percent being retained on the No. 4 sieve (i.e., gravel fraction). The material has further been classified as poorly-graded, with a Unified Soil Classification of GP-GM. The sample had an internal angle of friction of 35 degrees and a cohesive strength of 490 pounds per square foot.

Slope-stability analyses were performed using the computer program GEOSLOPE (Version 5.0), which is based on the FORTRAN program STABL3, developed at Purdue University. GEOSLOPE utilizes the limit equilibrium procedure of slices (Simplified Bishop's method) to determine the safety factor of potential failure surfaces for circular shapes.

Given the lack of seepage from the pad outslope, the slope-stability analyses were conducted based on unsaturated conditions. The materials were assumed to drain rapidly with no excess pore pressures developing in response to strains and stress changes.

Mr. Chris Hansen  
July 27, 1998  
Page 2

The engineering properties of the pad and other soil materials at the site were obtained from Appendix 5-4 of the Dugout Canyon Mine Phase II Mining and Reclamation Plan. Two conditions were evaluated

- Condition I - failure surfaces were allowed to begin and end in the road and pad areas, outside of the waste rock,
- Condition II - failure surfaces were allowed to begin and end only within the waste rock.

Results of the slope-stability analyses are presented in Attachment B. As indicated, the minimum safety factor for Condition I was determined to be 2.67. The minimum safety factor under Condition II is 2.83. Hence, the waste rock and the adjacent slope are stable.

Please contact me if you have any questions.

Sincerely,



Richard B. White, P.E.  
President

Attachments



Mr. Chris Hansen  
July 27, 1998  
Page 3

**ATTACHMENT A**

Results of Waste-Rock Analyses



Applied Geotechnical Engineering Consultants, Inc.

July 15, 1998

Earthfax Engineering  
7324 South 1300 East, Suite 100  
Midvale, UT 84047

Attention: Richard B. White  
Subject: Soils Laboratory Testing  
AGEC Project No. 973301

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to provide laboratory testing on a sample received July 2, 1998. The following tests have been performed in general accordance with the test method listed.

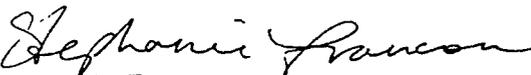
Test	Test Method
Particle Size Analysis	ASTM D-422
Atterberg Limits	ASTM D-4318
Direct Shear	ASTM D-3080
Standard Proctor	ASTM D-698

The results of the laboratory testing are shown graphically in Figures 1-2. The direct shear test specimens were remolded to approximately 90% of the standard proctor maximum dry density near optimum moisture content. Only material passing the #4 sieve was used in direct shear testing.

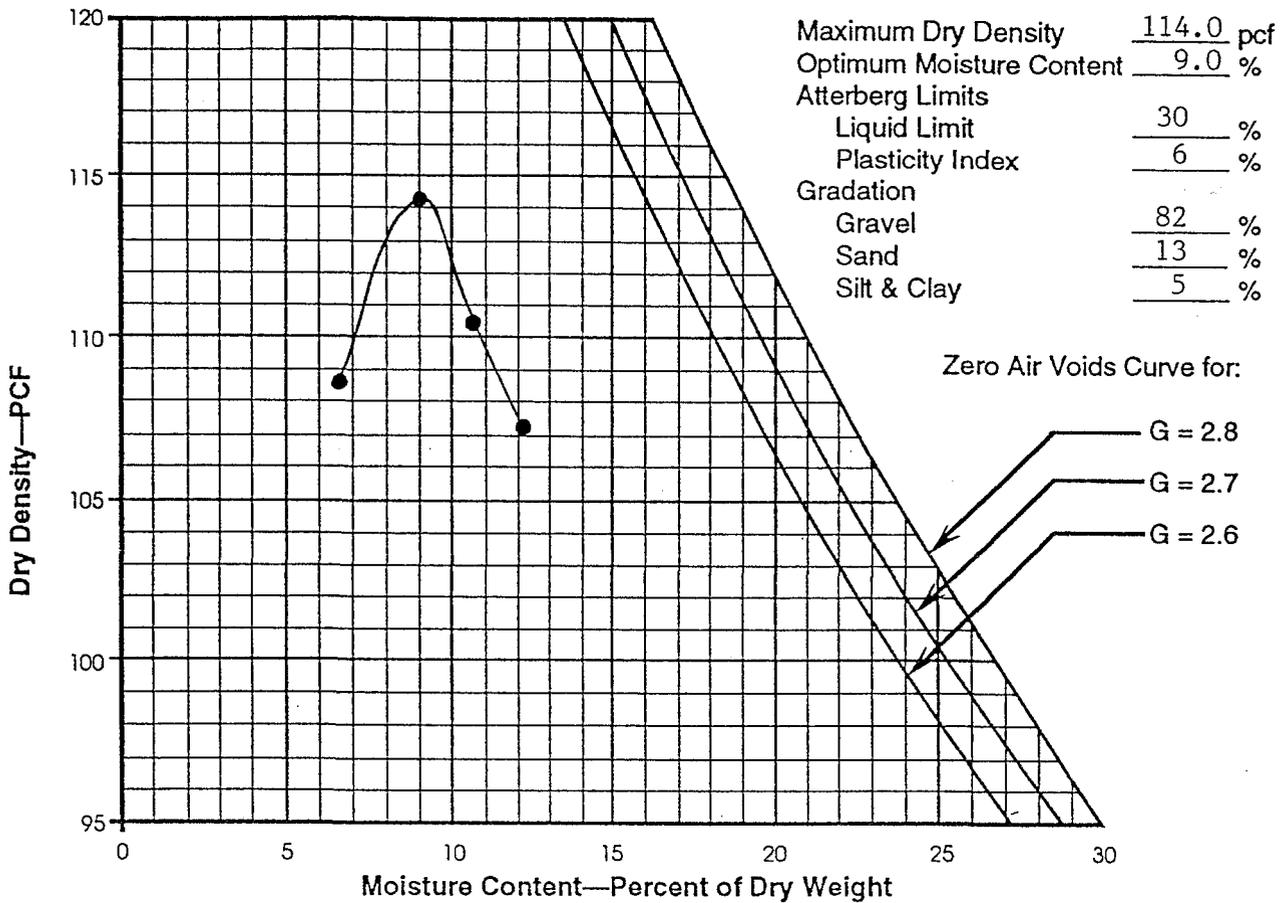
If you have any questions, or if we can be of further service, please call.

Sincerely,

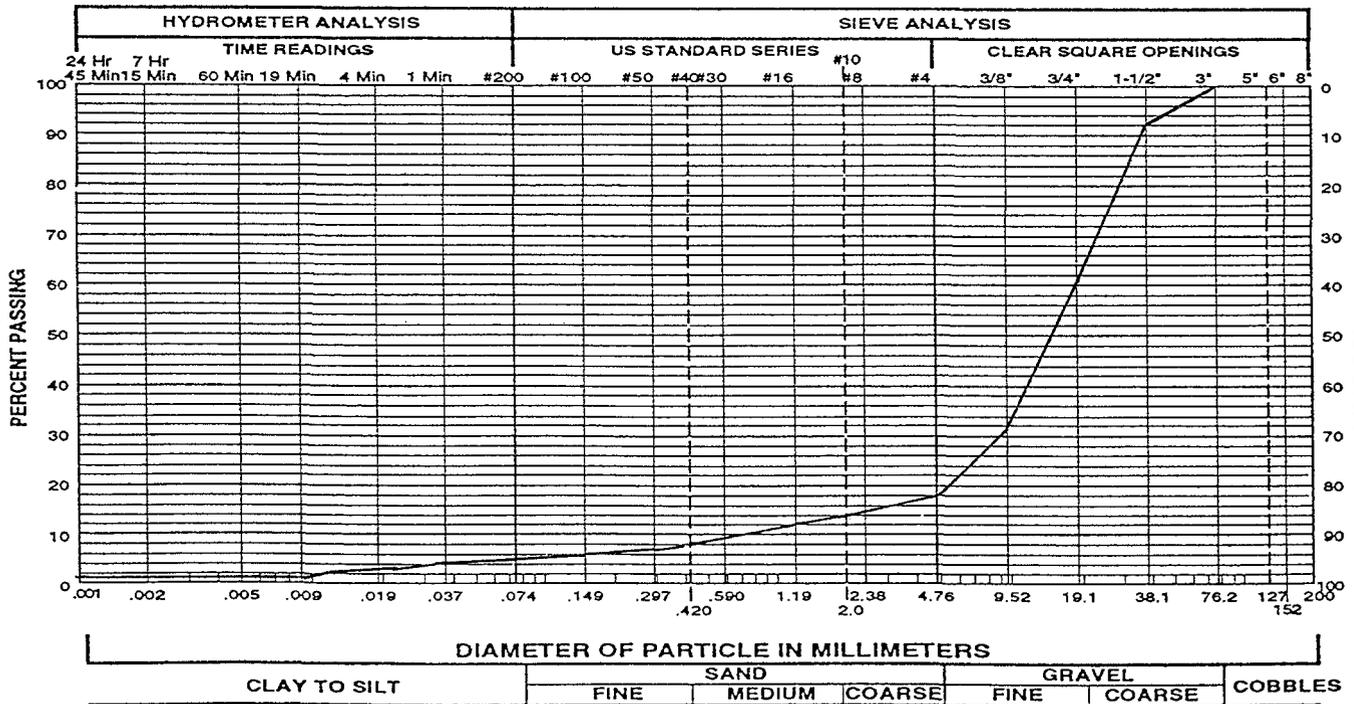
APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

  
Stephanie Francom  
Rev. SDA, E.I.T.

# Applied Geotechnical Engineering Consultants, Inc.



Compaction Test Procedure ASTM D-698 Method D  
 Sample of: Poorly-Graded Gravel with Silt (GP-GM) From: DCM-1 (7/6/98)

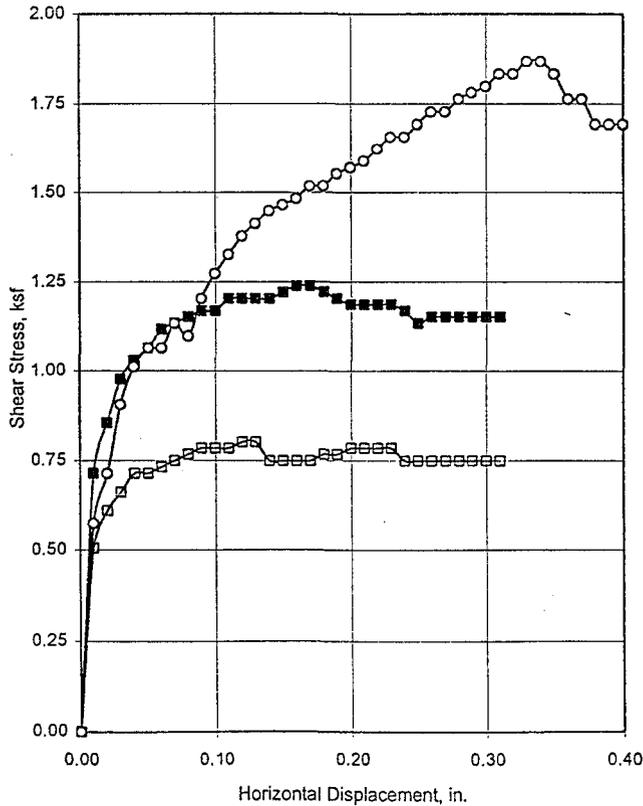
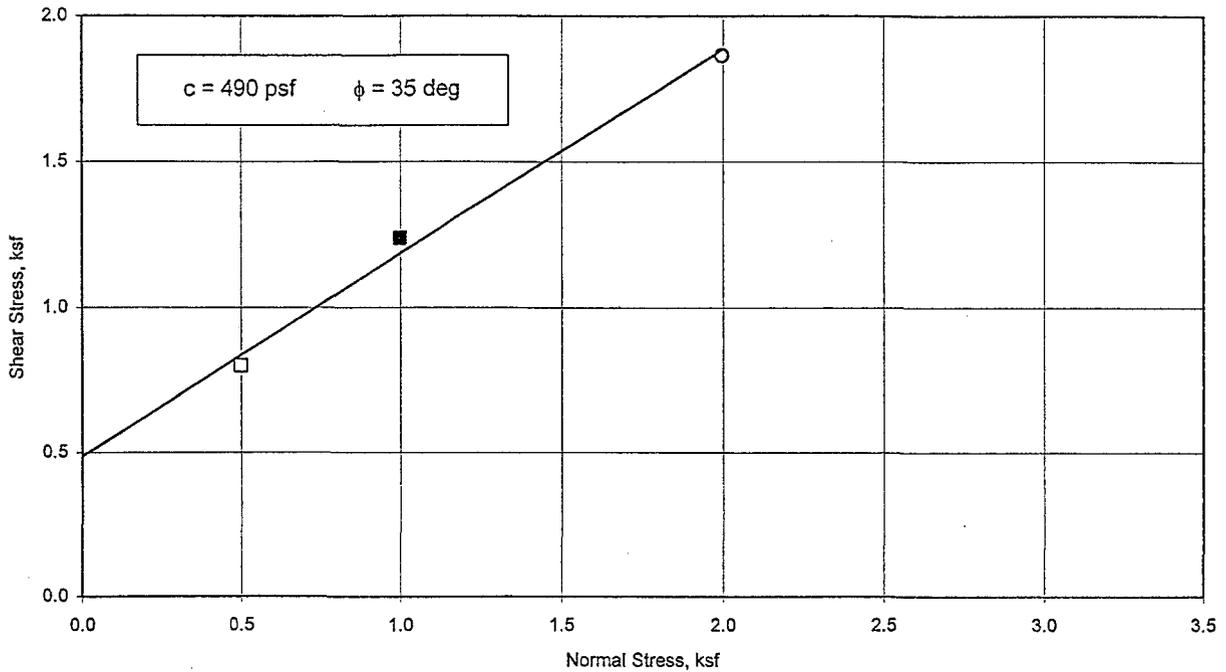


Project No. 973301

## GRADATION & COMPACTION TEST RESULTS

Figure 1

# Applied Geotechnical Engineering Consultants, Inc.



Test No. (Symbol)	1(□)	2(■)	3(O)
Sample Type	Remolded		
Length, in.	0.75	0.75	0.75
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	112	112	112
Moisture Content, %	9	9	9
Consolidation Load, ksf	0.5	1.0	2.0
Normal Load, ksf	0.5	1.0	2.0
Shear Stress, ksf	0.80	1.24	1.87
Remarks	Strain Rate 0.05 in/min. Only soil passing the #4 sieve was used in test.		

Sample Index Properties	
Dry Density, pcf	N/A
Moisture Content, %	N/A
Liquid Limit, %	30
Plasticity Index, %	6
Percent Gravel	82
Percent Sand	13
Percent Passing No. 200 Sieve	5

Type of Test                      Consolidated Undrained/Saturated  
 Sample Description              Poorly Graded Gravel with Silt (GP-GM)                      From    DCM-1

Project No.    973301

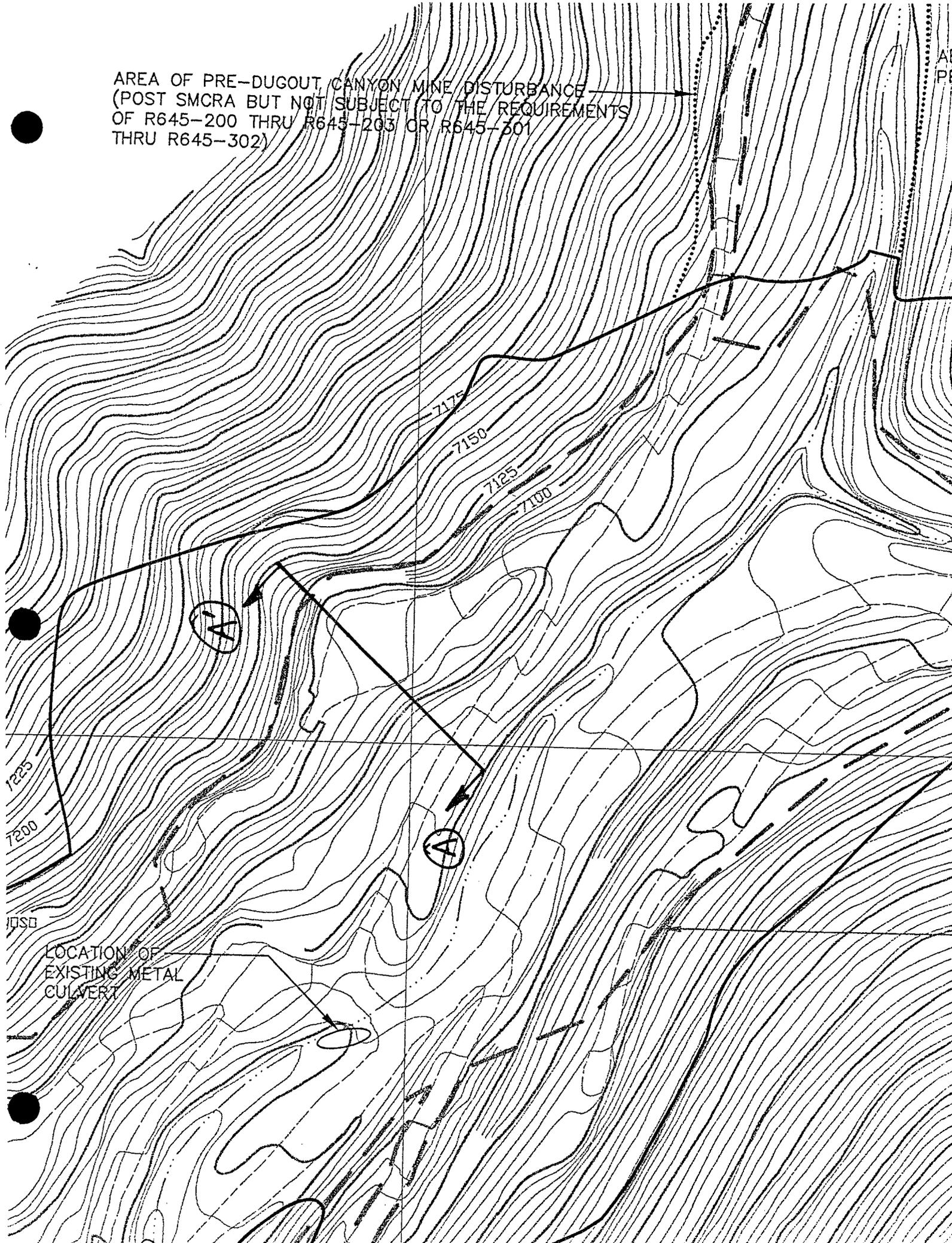
## DIRECT SHEAR TEST RESULTS

Figure    2

**ATTACHMENT B**

Results of Slope-Stability Analyses

AREA OF PRE-DUGOUT CANYON MINE DISTURBANCE  
(POST SMCRA BUT NOT SUBJECT TO THE REQUIREMENTS  
OF R645-200 THRU R645-203 OR R645-301  
THRU R645-302)



LOCATION OF  
EXISTING METAL  
CULVERT

GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY — Failure surfaces can begin and  
Remarks : end outside of the waste rock

#### INPUT DATA

##### Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

##### Soil Parameters

Number of Soil Types : 2

#### TRIAL SURFACE GENERATION

##### Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 30.00 ft  
Right Initiation Point : 69.00 ft  
Left Termination Point : 70.00 ft  
Right Termination Point : 120.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

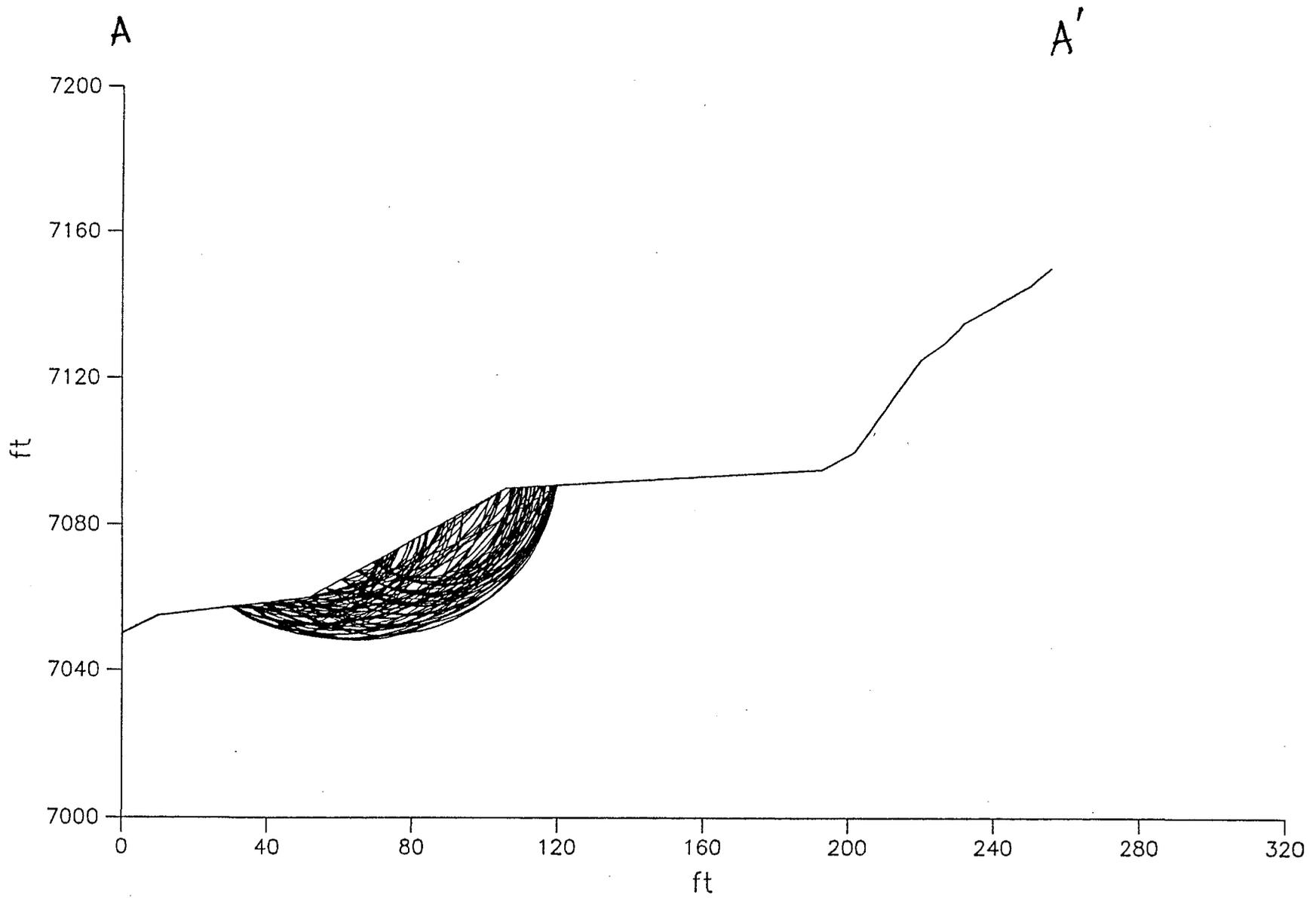
#### RESULTS

##### Critical Surface

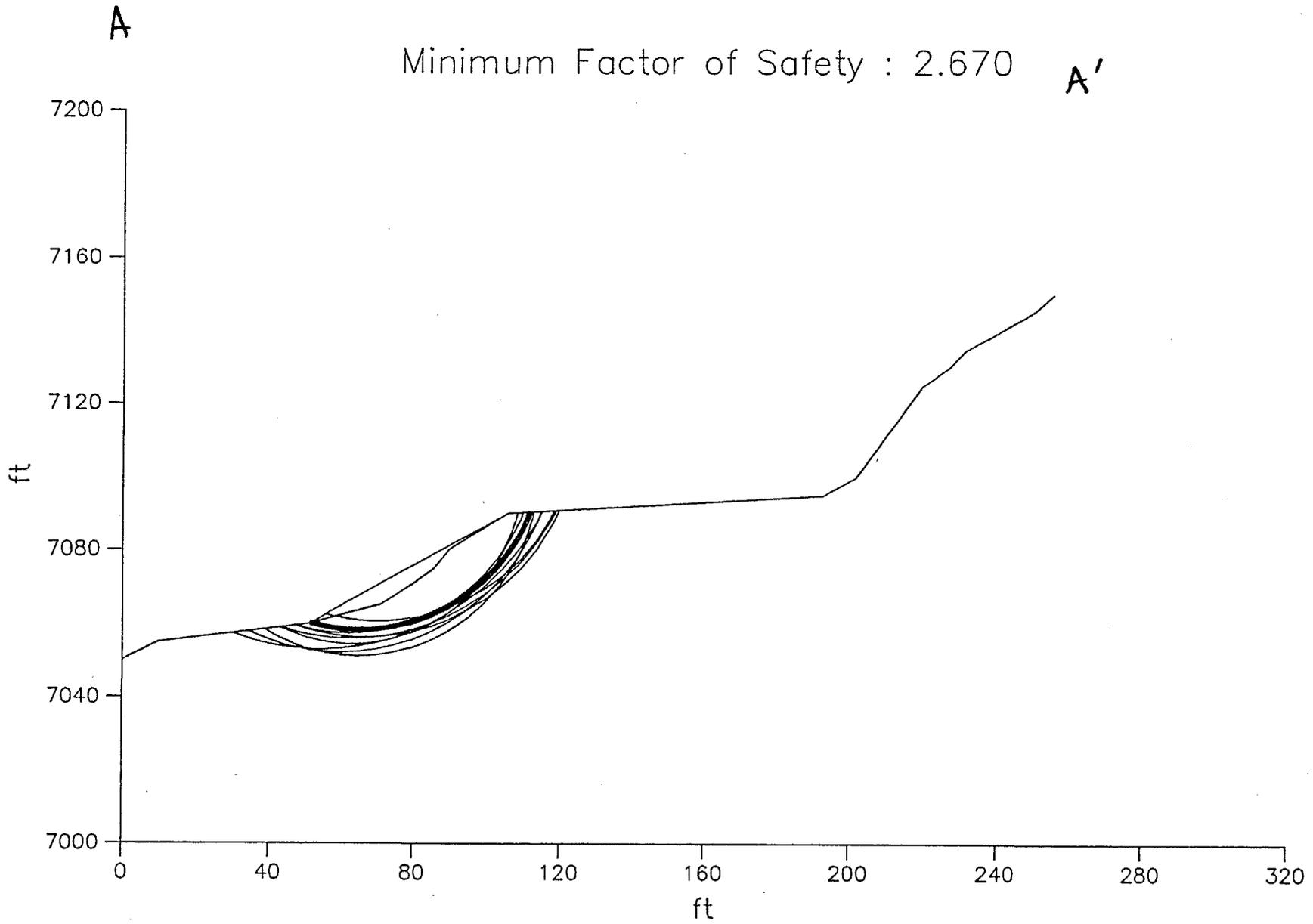
Factor of Safety : 2.670

□

# Circular Surfaces – Search for Critical Surfaces



Circular Surfaces – Best Critical Surfaces



GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY -

Remarks :

*Failure surfaces can begin and end  
in the waste rock only*

INPUT DATA

Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

Soil Parameters

Number of Soil Types : 2

TRIAL SURFACE GENERATION

Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 51.50 ft  
Right Initiation Point : 71.50 ft  
Left Termination Point : 86.00 ft  
Right Termination Point : 106.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

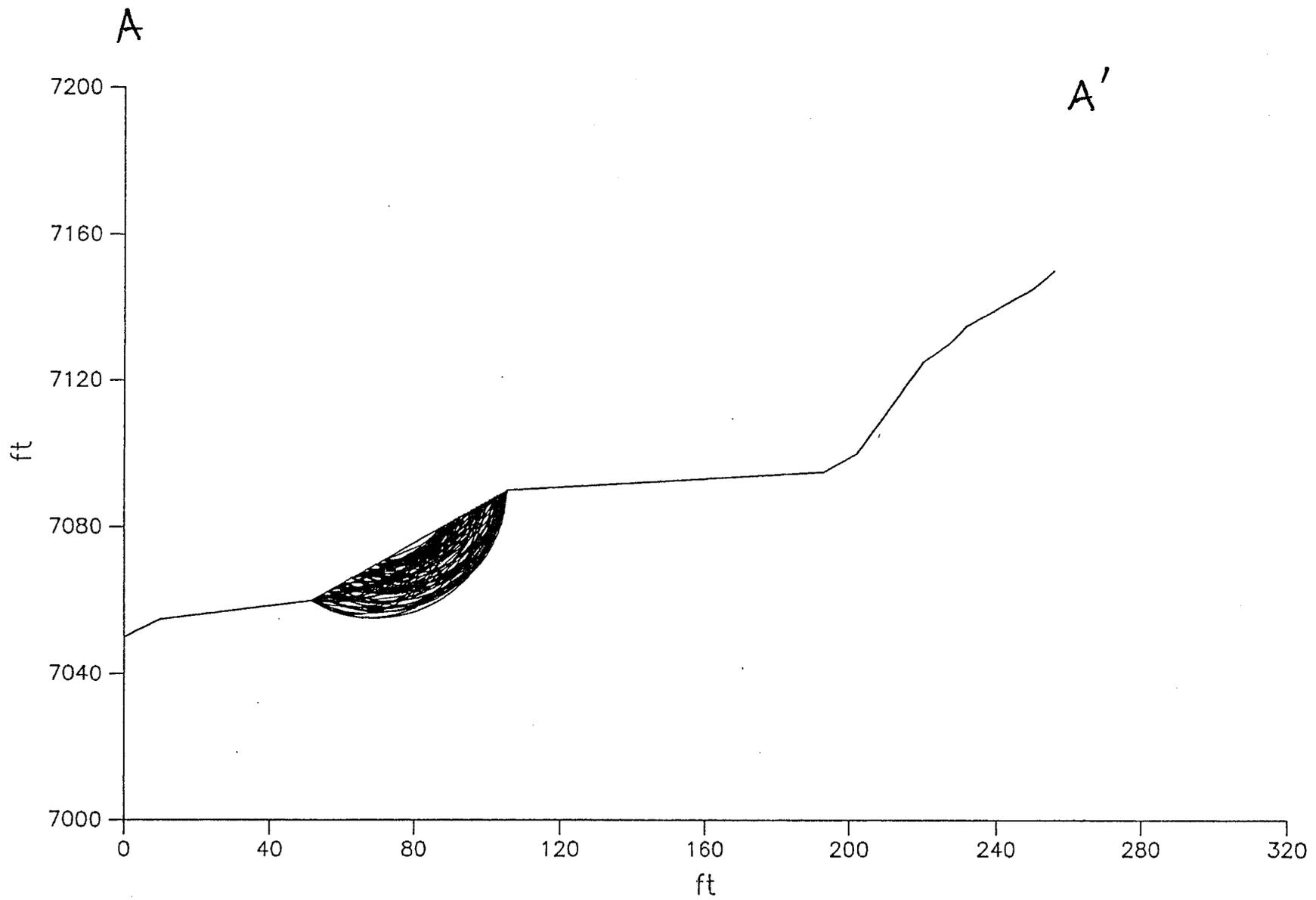
RESULTS

Critical Surface

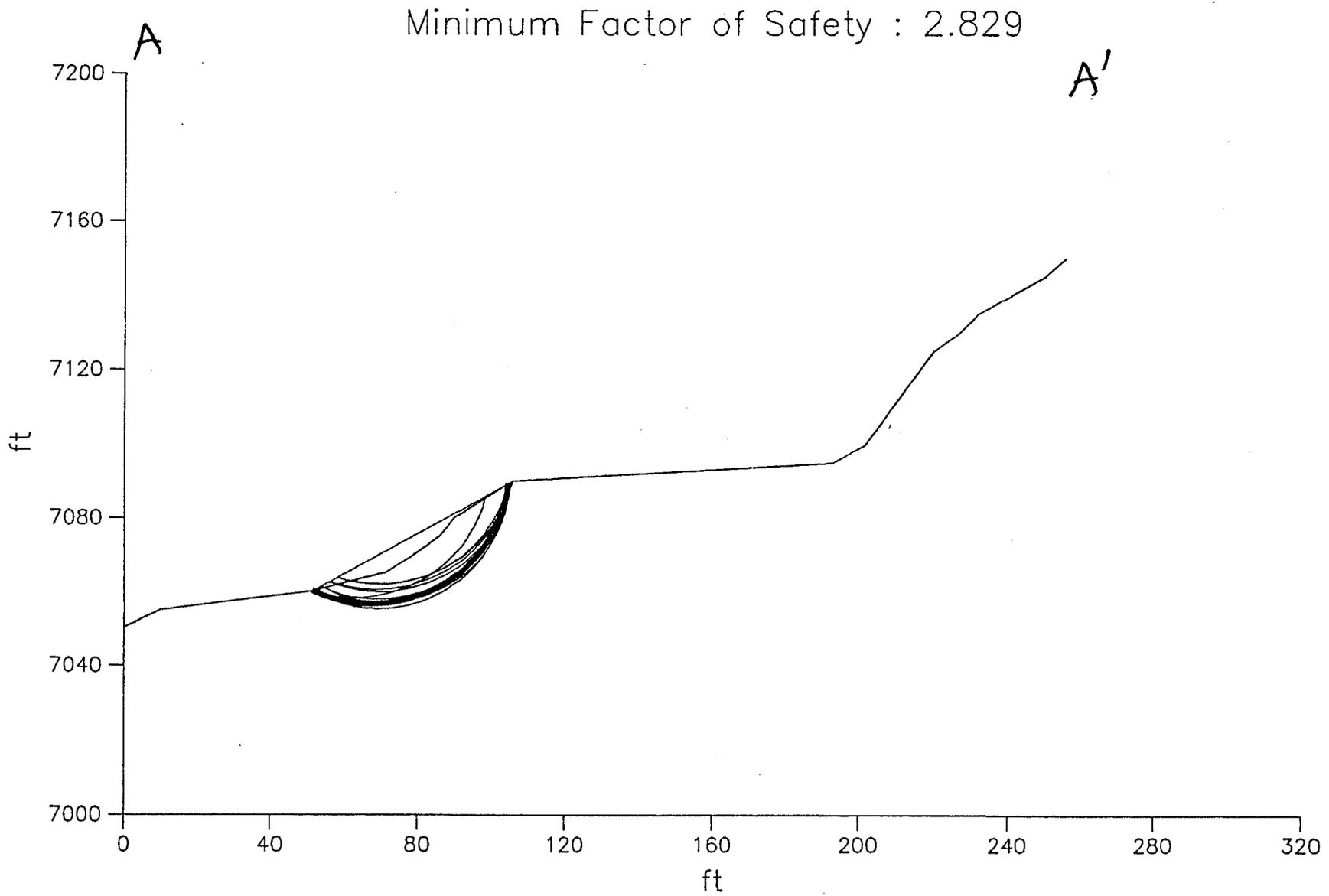
Factor of Safety : 2.829

□

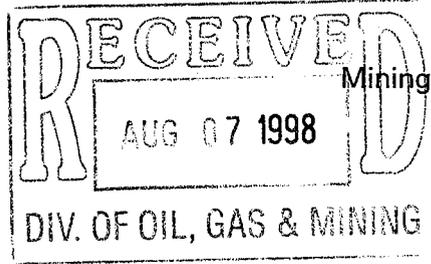
Circular Surfaces – Search for Critical Surfaces



Circular Surfaces – Most Critical Surfaces



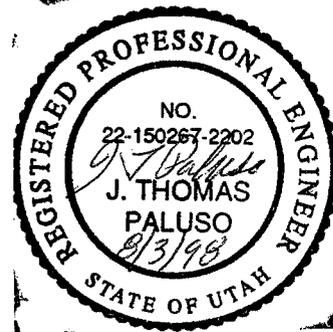
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

APPENDIX 7-12

NEW TEMPORARY WASTE ROCK STORAGE DIVERSION STRUCTURES



This appendix includes a figure illustrating the new temporary waste rock storage area, containment berm, silt fence locations, and surface runoff flow direction in the storage area and calculations supporting the design of the berms for a 100-year 6-hour storm event that produces 2.05 inches of precipitation. Silt fences are located down gradient of the storage area as shown on the attached figure to treat runoff from the berm and road.

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

RUNOFF FROM MINE WASTE ROCK PILE

by

Name: Gary E. Taylor

Company Name: CANYON FUEL CO., SKYLINE MINE  
File Name: C:\SEDCAD3\SPOIL

Date: 06-15-1998

Civil Software Design -- SEDCAD+ Version 3.1  
Copyright (C) 1987-1992. Pamela J. Schwab. All rights reserved.

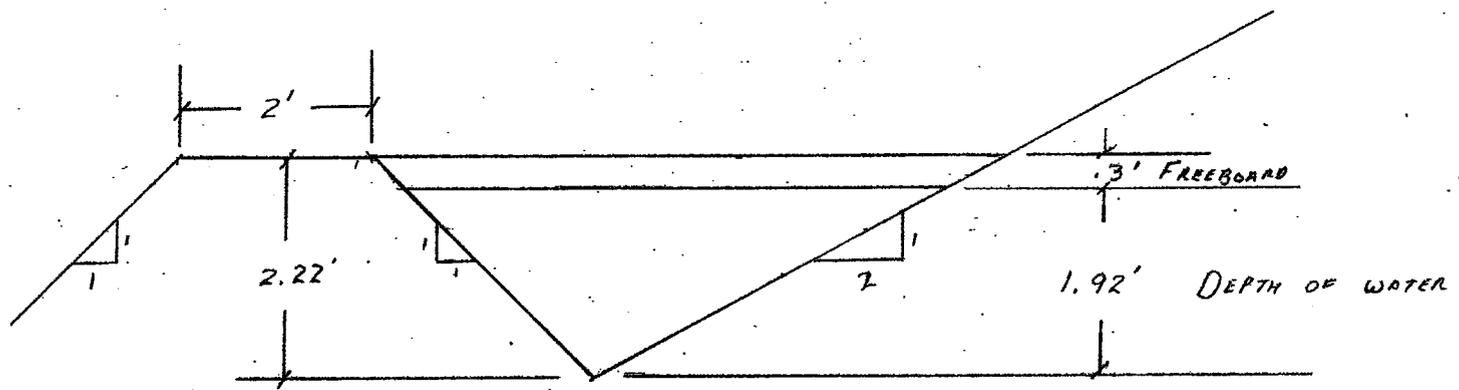
Company Name: CANYON FUEL CO., SKYLINE MINE  
Filename: C:\SEDCAD3\SPOIL User: Gary E. Taylor  
Date: 06-15-1998 Time: 15:41:04  
Runoff from Mine Waste Rock Pile  
Storm: 2.05 inches, 100 year- 6 hour, SCS Type II  
Hydrograph Convolution Interval: 1.0 hr

=====  
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE  
=====

-Hydrology-

JBS SWS	Area (ac)	CN UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111 1	0.33	85 M	0.030	0.000	0.000	0.0	0.02	0.44
		Type: Null		Label: spoil				
111 Structure	0.33						0.02	
111 Total IN/OUT	0.33						0.02	0.44

TYPICAL CROSS-SECTION  
OF CONFINEMENT AREA



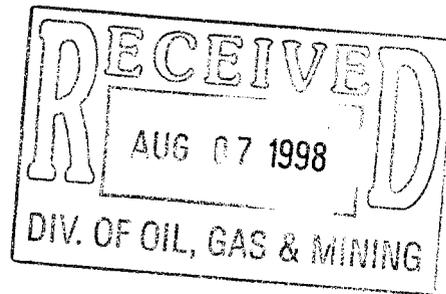
22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS





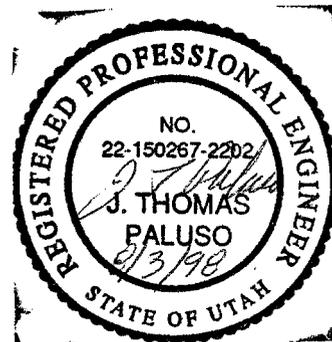
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine

Mining and Reclamation Plan  
August 1998



**APPENDIX 5-7**

**NEW TEMPORARY WASTE ROCK STORAGE LOCATION INFORMATION**



This appendix includes the following items:

- A description of the material to be stored,
- A brief material handling description,
- Stockpile capacity,
- A cross section of the temporary waste rock pile,
- Chemical analysis of the waste rock to be stored.

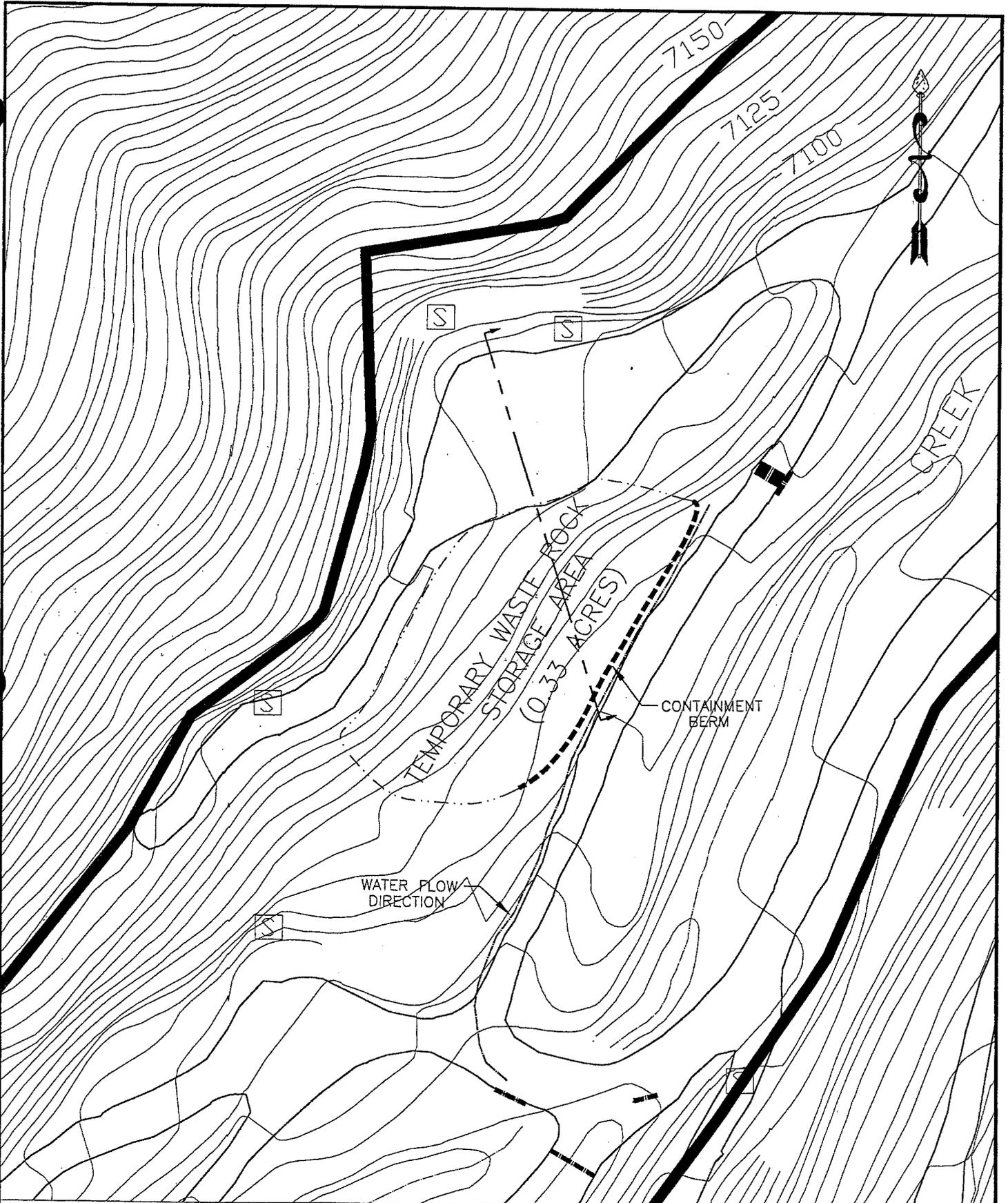
The description of the material and material handling plan follows below while the remaining three items are included in the attached pages.

#### Material Description:

The waste rock material consists of shale, siltstone, and sandstone fragments. This material has fallen from the roof of the mine over the past 40 years. The material consists of angular sand, gravel, and cobble size clasts. Acid- and toxic-forming analysis results have been included in the attached pages. As noted on the cross section sheet, the storage volume is 1926 CY.

#### Material Handling:

The waste rock will be scooped and loaded underground using underground mining equipment. The waste rock will then be brought to the surface and dumped over the existing pad slope as shown in the attached figure. As waste rock accumulates on and at the base of the slope, appropriate earthmoving equipment will be used to distribute the waste rock within the containment area. This will allow for the maximum storage volume to be achieved and reduce the risk of creating unstable slopes. Every 1000 tons of waste rock removed will be tested for acid- and toxic- forming characteristics after it has been stored at the surface for approximately two weeks. If it is not found to have acid- or toxic-forming characteristics, it may be used for fill during mine site construction activities. It will be placed and compacted as fill following the methods described in the approved M&RP. If the waste rock is found to be unsuitable as fill, it will be transported to either the SUFCo or Skyline Mine waste rock storage areas as approved in the M&RP.



**LEGEND**

-  SILT FENCE
-  BROAD SWALE
-  DISTURBED AREA BOUNDARY

REVISIONS OR UP-DATES			DATE:
NO.	DATE	BY	6-18-98
		DESIGNED BY:	C. HANSEN
		DRAWN BY:	G. TAYLOR
		CHECKED BY:	C. HANSEN
		SCALE:	

 Canyon Fuel Company, LLC  
Soldier Canyon Mine

**TEMPORARY WASTE ROCK STORAGE AREA**

P.O. BOX 1029  
WELLINGTON, UTAH 84542  
DRAWING OR MAP NUMBER  
ACT/007/039

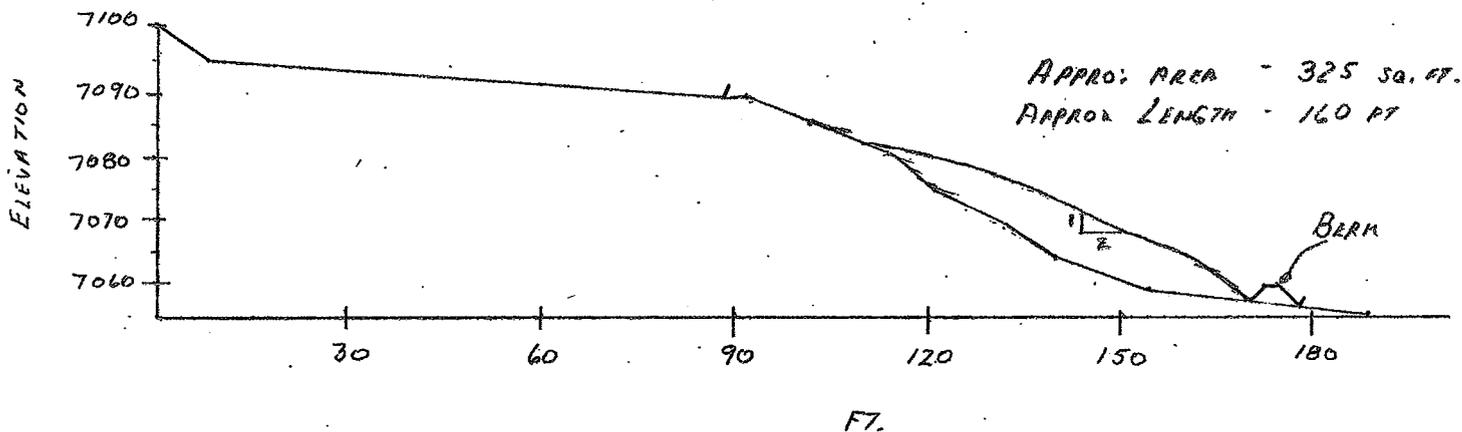
FILENAME: A:\act\007\039.dwg

TYPICAL CROSS-SECTION  
 TEMPORARY WASTE ROCK  
 STORAGE AREA

18 June 1998

G. TAYLOR

$$\begin{aligned} \text{VOLUME} &= 325 \text{ SQ. FT.} \times 160 \text{ FT.} / 27 \text{ CU. FT. / CU. YD.} \\ &= 1926 \text{ CU. YD.} \end{aligned}$$



SCALE 1" = 30' H AND V

22-141 50 SHEETS  
 22-142 100 SHEETS  
 22-144 200 SHEETS





Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 1 of

Lab No.	Location	Depths feet	pH	EC umhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124887	ROCK CYN ROOF	0.0-0.0	7.8	1.53	24.2	3.49	8.06	4.34	1.81		72.4	20.0	7.6	SANDY LOAM
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124889	COAL	0.0-0.0	8.4	0.97	58.4	0.42	0.46	8.02	12.1		88.4	9.0	2.6	SAND
124890	GILSON ROOF	0.0-0.0	7.5	0.66	28.1	2.34	2.79	0.88	0.55		39.4	41.0	19.6	LOAM
124891	FLOOR	0.0-0.0	7.8	1.58	23.4	3.35	8.76	4.57	1.86		69.4	22.0	8.6	SANDY LOAM
124892	COAL	0.0-0.0	7.2	2.30	56.7	23.2	5.68	0.85	0.22		88.4	8.0	3.6	SAND

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

06-11-98 12:14PM FROM 801 637 0108 TO SKYLINE P004/009



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WRELLINGTON, UTAH

August 24, 1995

Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124887	ROCK CYN ROOF	0.0-0.0	3.6	0.17	5.31	181.	176.					
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124889	COAL	0.0-0.0	93.3	0.38	11.9	43.6	31.7					
124890	GILSON ROOF	0.0-0.0	4.9	0.02	0.62	1.74	1.12					
124891	FLOOR	0.0-0.0	4.5	0.09	2.81	173.	171.					
124892	COAL	0.0-0.0	93.3	0.45	14.1	23.8	9.69					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P005/009

TO SKYLINE

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1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 3 of

Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Nkjeldahl Nitrogen %	1/3 bar	15 bar
124887	ROCK CYN ROOF	0.0-0.0	1.02	0.28	0.02	0.37	0.26	2.24	0.03	9.6	2.4
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124889	COAL	0.0-0.0	1.22	1.64	<0.02	0.69	0.22	1.30	0.77	9.5	8.1
124890	GILSON ROOF	0.0-0.0	1.20	0.97	0.08	0.28	0.26	8.62	0.04	14.9	4.1
124891	FLOOR	0.0-0.0	1.26	0.28	0.02	0.38	0.27	2.40	0.03	13.7	2.9
124892	COAL	0.0-0.0	1.20	1.77	<0.02	0.39	0.34	1.38	0.74	17.8	7.9

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P006/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 1 of

Lab No.	Location	Depths feet	pH	EC mmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124894	124888(DUP)	0.0-0.0	7.8	0.94	35.6	4.18	4.53	0.80	0.38		67.4	23.0	9.6	SANDY LOAM

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P007/009  
TO SKYLINE  
06-11-98 12:14PM FROM 801 637 0108



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124894	124888(DDP)	0.0-0.0	1.6	0.02	0.62	92.0	91.4					

Abbreviations used in acid-base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P008/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 3 of

Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CBC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124894	124888 (DUP)	0.0-0.0	1.04	0.28	<0.02	0.28	0.25	3.54	0.02	14.6	2.8

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CBC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P009/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM

**SLOPE STABILITY ANALYSIS**

July 27, 1998



**EarthFax**

EarthFax  
Engineering Inc.  
Engineers/Scientists  
7324 So. Union Park Ave.  
Suite 100  
Midvale, Utah 84047  
Telephone 801-561-1555  
Fax 801-561-1861

Mr. Chris Hansen  
Canyon Fuel Company, LLC  
Skyline Mine  
P.O. Box 719  
Helper, UT 84526

Subject:       Stability of Temporary Waste-Rock Pile  
                  at the Dugout Canyon Mine

Dear Chris:

Pursuant to your request, we have evaluated the stability of the temporary waste-rock pile at the Dugout Canyon Mine in Carbon County, Utah. This pile has been created from the sidecast of roof-fall and other rock materials being cleaned from the old Dugout Canyon portals. The material has been sidecast off the old portal pad to an area adjacent to the dirt road which exists at an elevation approximately 20 to 25 feet lower than the pad. This analysis was performed to address the concerns expressed by the Utah Division of Oil, Gas and Mining at a recent site meeting.

A sample of the sidecast waste rock was collected and submitted to Applied Geotechnical Engineering Consultants, Inc. for analyses of the following physical properties:

- Particle-size analysis (ASTM D-422)
- Atterberg limits (ASTM D-4318)
- Direct shear (ASTM D-3080)
- Standard Proctor (ASTM D-698)

Results of these analyses are presented in Attachment A. According to these analyses, the waste rock is coarse-grained, with approximately 95 percent retained on the No. 200 sieve (i.e., sand fraction or larger) and approximately 82 percent being retained on the No. 4 sieve (i.e., gravel fraction). The material has further been classified as poorly-graded, with a Unified Soil Classification of GP-GM. The sample had an internal angle of friction of 35 degrees and a cohesive strength of 490 pounds per square foot.

Slope-stability analyses were performed using the computer program GEOSLOPE (Version 5.0), which is based on the FORTRAN program STABL3, developed at Purdue University. GEOSLOPE utilizes the limit equilibrium procedure of slices (Simplified Bishop's method) to determine the safety factor of potential failure surfaces for circular shapes.

Given the lack of seepage from the pad outslope, the slope-stability analyses were conducted based on unsaturated conditions. The materials were assumed to drain rapidly with no excess pore pressures developing in response to strains and stress changes.

Mr. Chris Hansen  
July 27, 1998  
Page 2

The engineering properties of the pad and other soil materials at the site were obtained from Appendix 5-4 of the Dugout Canyon Mine Phase II Mining and Reclamation Plan. Two conditions were evaluated

- Condition I - failure surfaces were allowed to begin and end in the road and pad areas, outside of the waste rock,
- Condition II - failure surfaces were allowed to begin and end only within the waste rock.

Results of the slope-stability analyses are presented in Attachment B. As indicated, the minimum safety factor for Condition I was determined to be 2.67. The minimum safety factor under Condition II is 2.83. Hence, the waste rock and the adjacent slope are stable.

Please contact me if you have any questions.

Sincerely,



Richard B. White, P.E.  
President

Attachments



Mr. Chris Hansen  
July 27, 1998  
Page 3

**ATTACHMENT A**

Results of Waste-Rock Analyses



Applied Geotechnical Engineering Consultants, Inc.

July 15, 1998

Earthfax Engineering  
7324 South 1300 East, Suite 100  
Midvale, UT 84047

Attention: Richard B. White  
Subject: Soils Laboratory Testing  
AGEC Project No. 973301

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to provide laboratory testing on a sample received July 2, 1998. The following tests have been performed in general accordance with the test method listed.

Test	Test Method
Particle Size Analysis	ASTM D-422
Atterberg Limits	ASTM D-4318
Direct Shear	ASTM D-3080
Standard Proctor	ASTM D-698

The results of the laboratory testing are shown graphically in Figures 1-2. The direct shear test specimens were remolded to approximately 90% of the standard proctor maximum dry density near optimum moisture content. Only material passing the #4 sieve was used in direct shear testing.

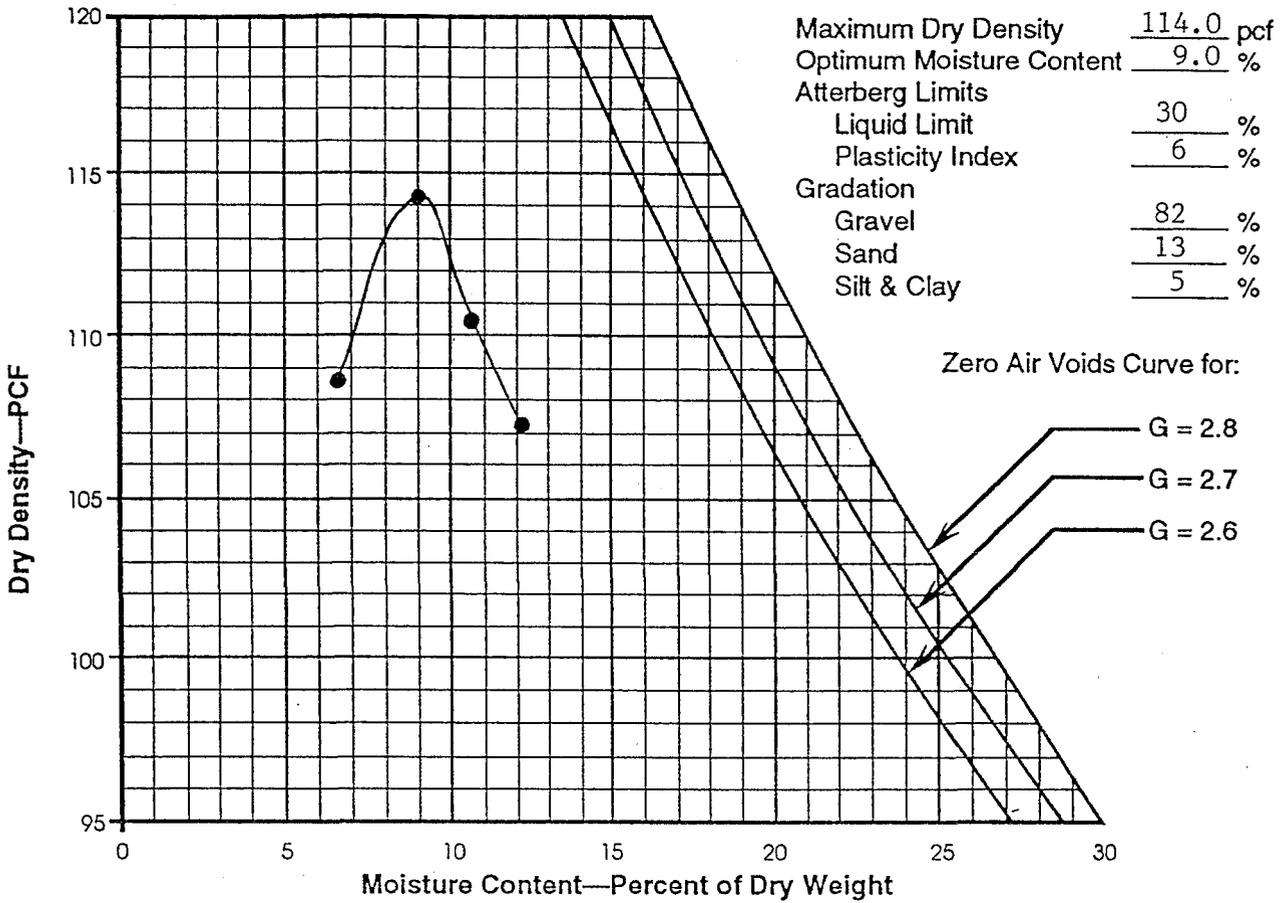
If you have any questions, or if we can be of further service, please call.

Sincerely,

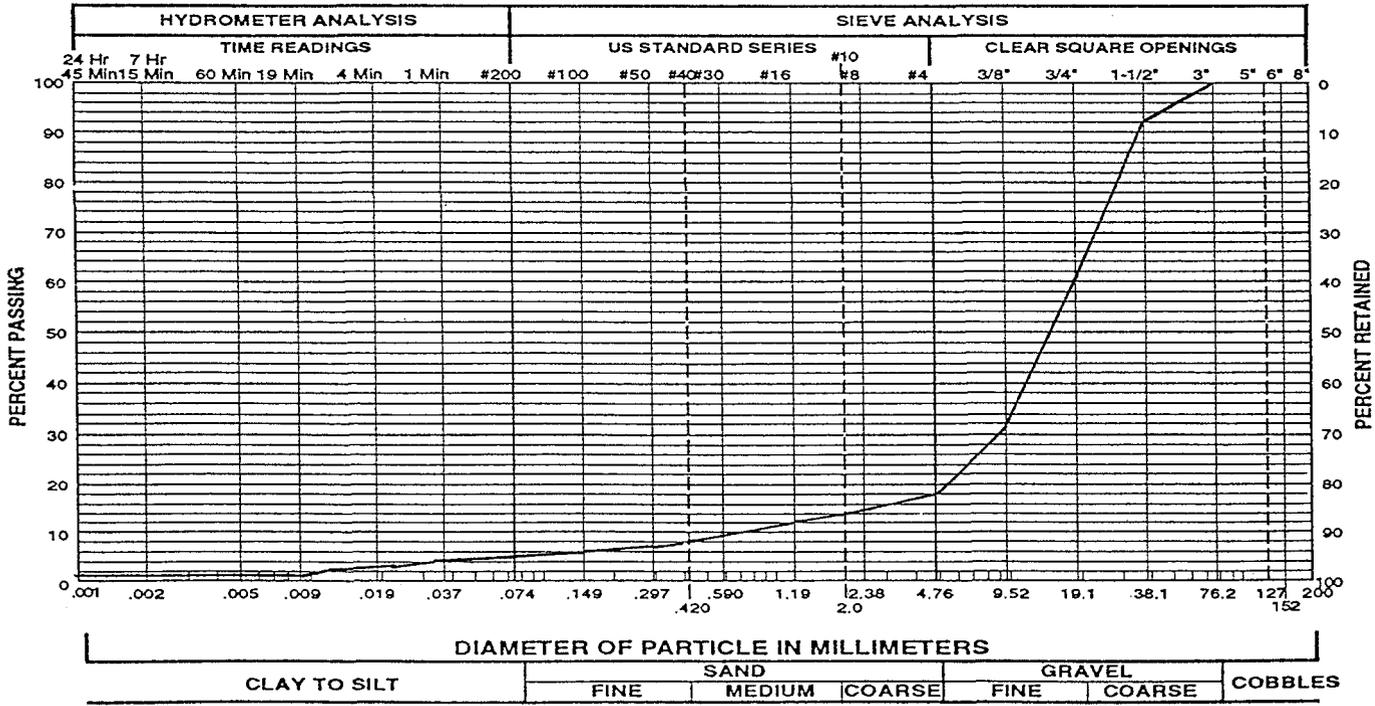
APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

*Stephanie Francom*  
Stephanie Francom  
Rev. SDA, E.I.T.

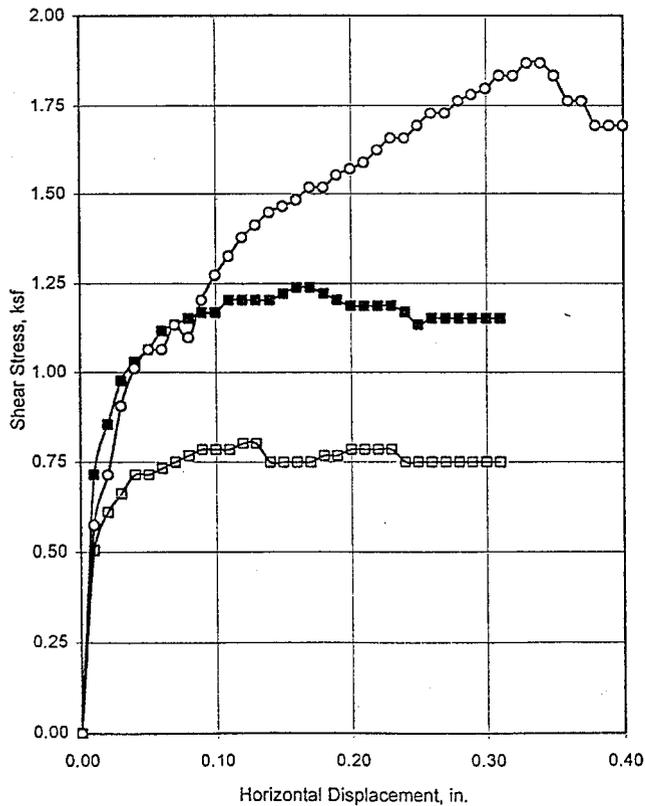
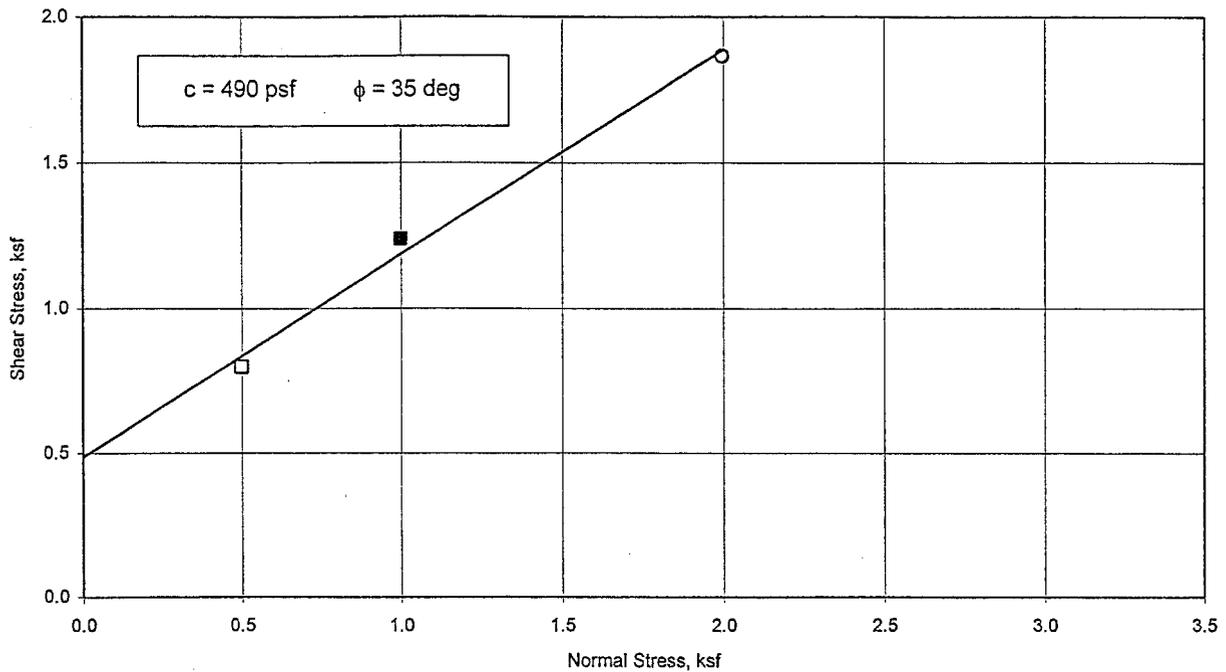
# Applied Geotechnical Engineering Consultants, Inc.



Compaction Test Procedure ASTM D-698 Method D  
 Sample of: Poorly-Graded Gravel with Silt (GP-GM) From: DCM-1 (7/6/98)



# Applied Geotechnical Engineering Consultants, Inc.



Test No. (Symbol)	1(□)	2(■)	3(O)
Sample Type	Remolded		
Length, in.	0.75	0.75	0.75
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	112	112	112
Moisture Content, %	9	9	9
Consolidation Load, ksf	0.5	1.0	2.0
Normal Load, ksf	0.5	1.0	2.0
Shear Stress, ksf	0.80	1.24	1.87
Remarks	Strain Rate 0.05 in/min. Only soil passing the #4 sieve was used in test.		

Sample Index Properties	
Dry Density, pcf	N/A
Moisture Content, %	N/A
Liquid Limit, %	30
Plasticity Index, %	6
Percent Gravel	82
Percent Sand	13
Percent Passing No. 200 Sieve	5

Type of Test                    Consolidated Undrained/Saturated  
Sample Description           Poorly Graded Gravel with Silt (GP-GM)                    From    DCM-1

Project No.    973301

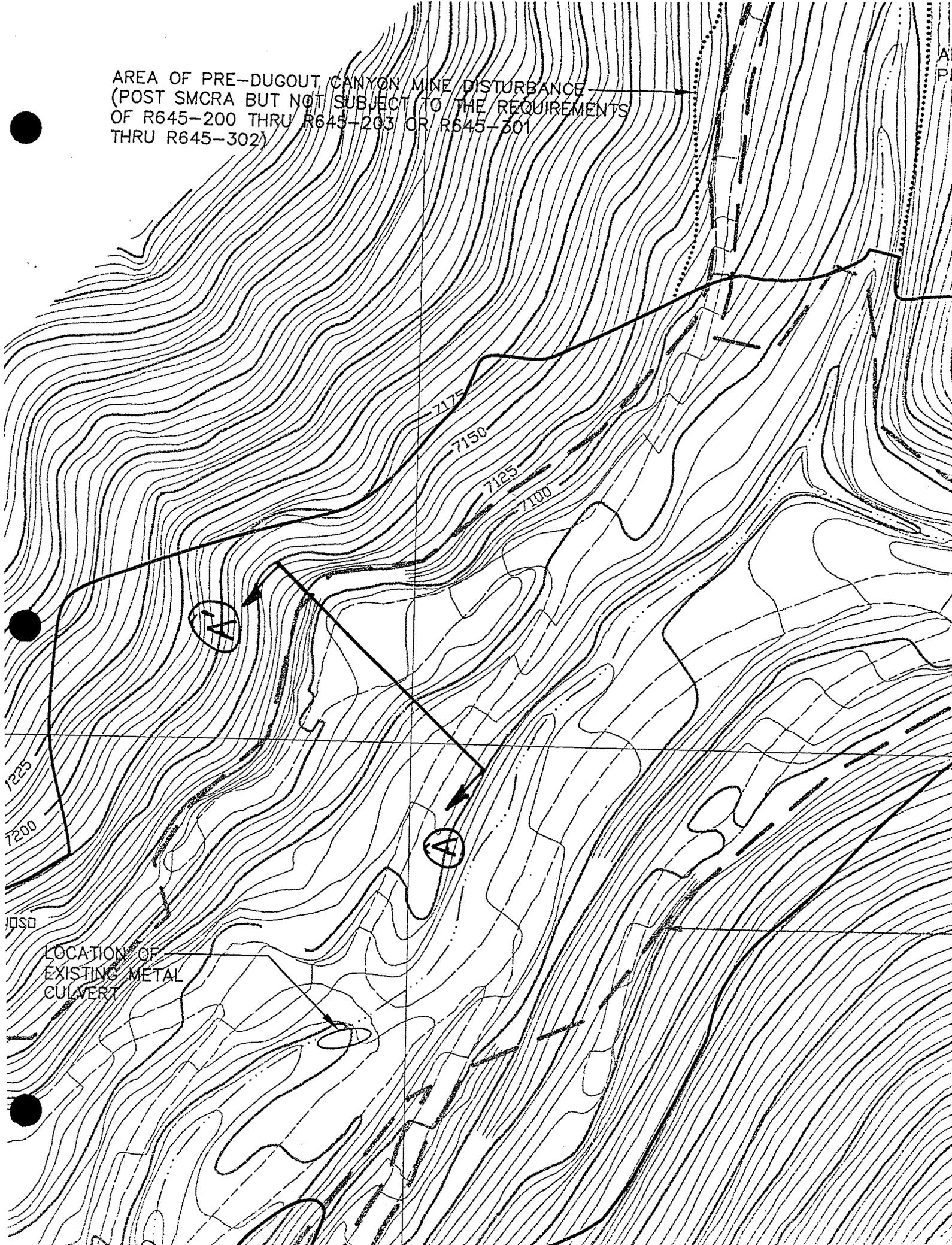
## DIRECT SHEAR TEST RESULTS

Figure    2

**ATTACHMENT B**

**Results of Slope-Stability Analyses**

AREA OF PRE-DUGOUT CANYON MINE DISTURBANCE  
(POST SMCRA BUT NOT SUBJECT TO THE REQUIREMENTS  
OF R645-200 THRU R645-203 OR R645-301  
THRU R645-302)



LOCATION OF  
EXISTING METAL  
CULVERT

GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE  
Description : PAD STABILITY — Failure surfaces can begin and  
Remarks : end outside of the waste rock

INPUT DATA

Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

Soil Parameters

Number of Soil Types : 2

TRIAL SURFACE GENERATION

Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 30.00 ft  
Right Initiation Point : 69.00 ft  
Left Termination Point : 70.00 ft  
Right Termination Point : 120.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

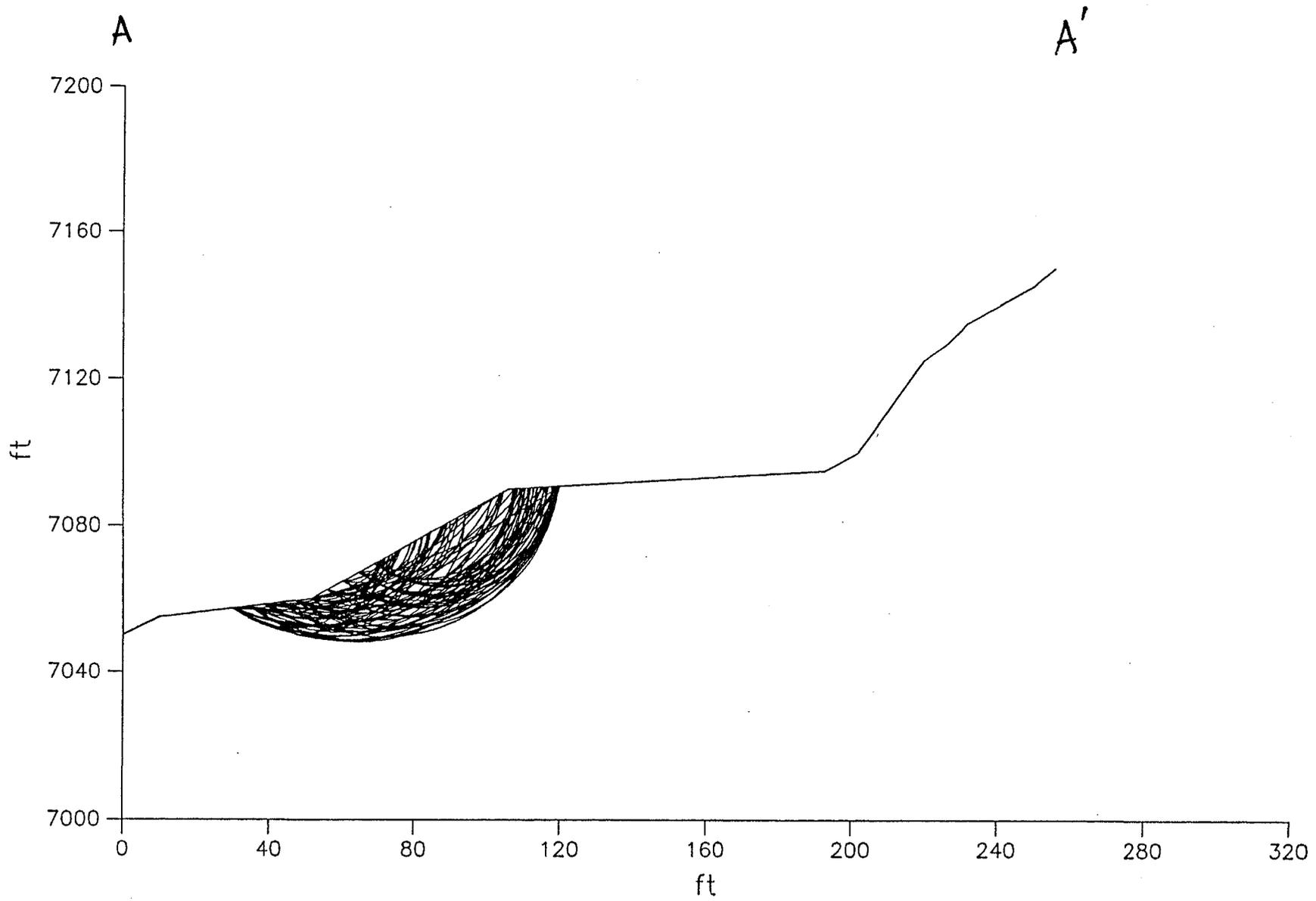
RESULTS

Critical Surface

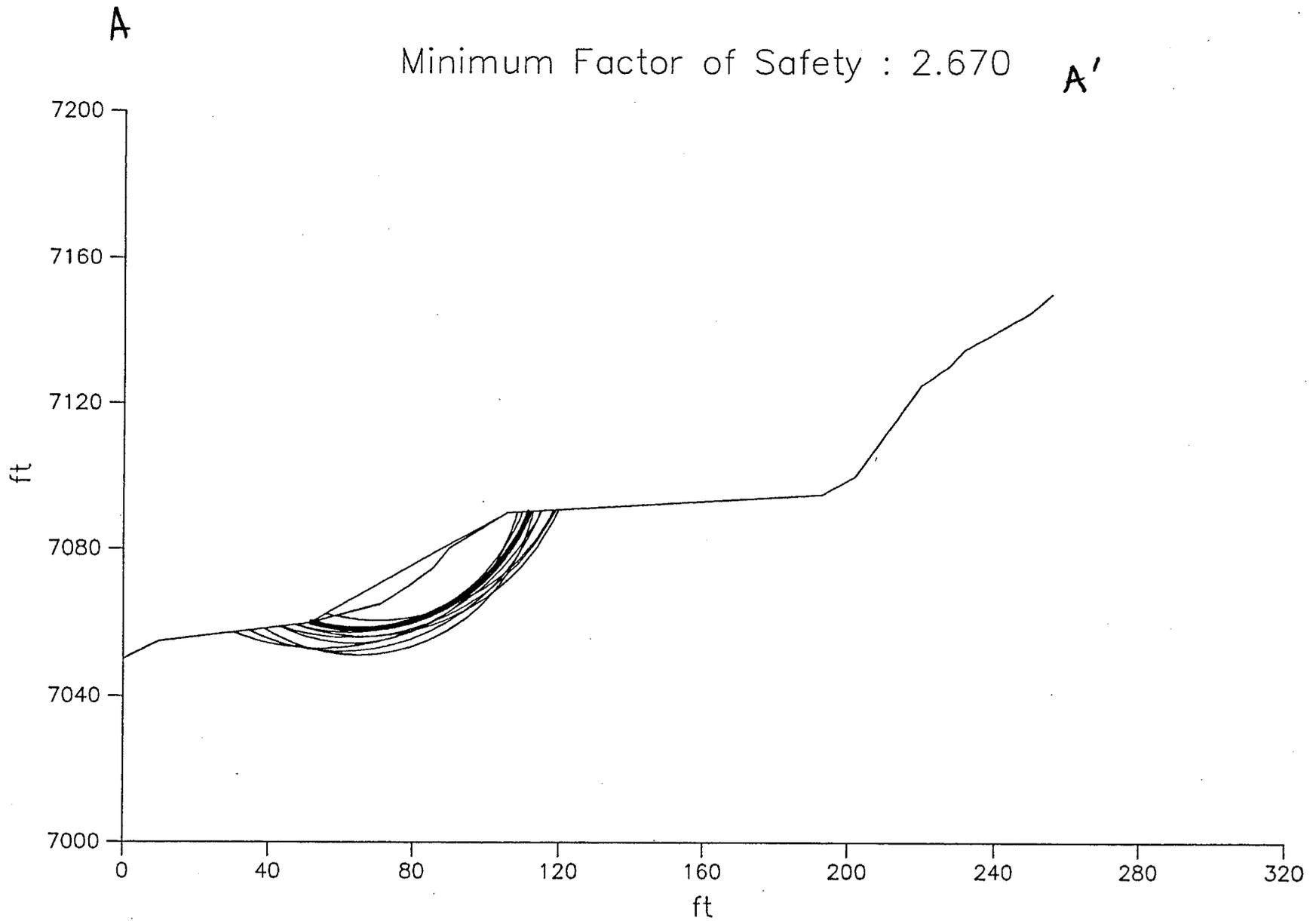
Factor of Safety : 2.670

□

# Circular Surfaces – Search for Critical Surfaces



Circular Surfaces – Most Critical Surfaces



GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY -

Remarks :

*Failure surfaces can begin and end  
in the waste rock only*

INPUT DATA

Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

Soil Parameters

Number of Soil Types : 2

TRIAL SURFACE GENERATION

Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 51.50 ft  
Right Initiation Point : 71.50 ft  
Left Termination Point : 86.00 ft  
Right Termination Point : 106.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

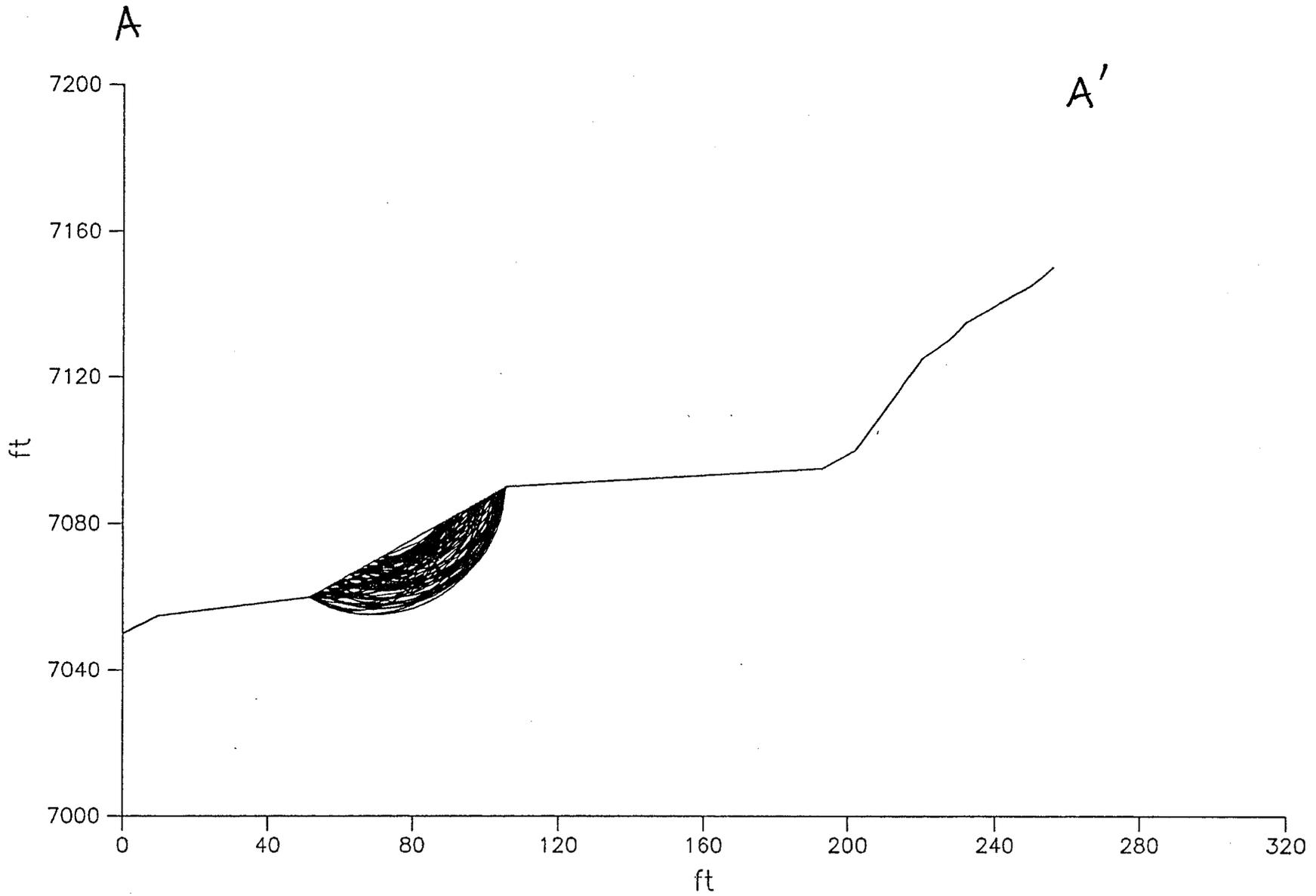
RESULTS

Critical Surface

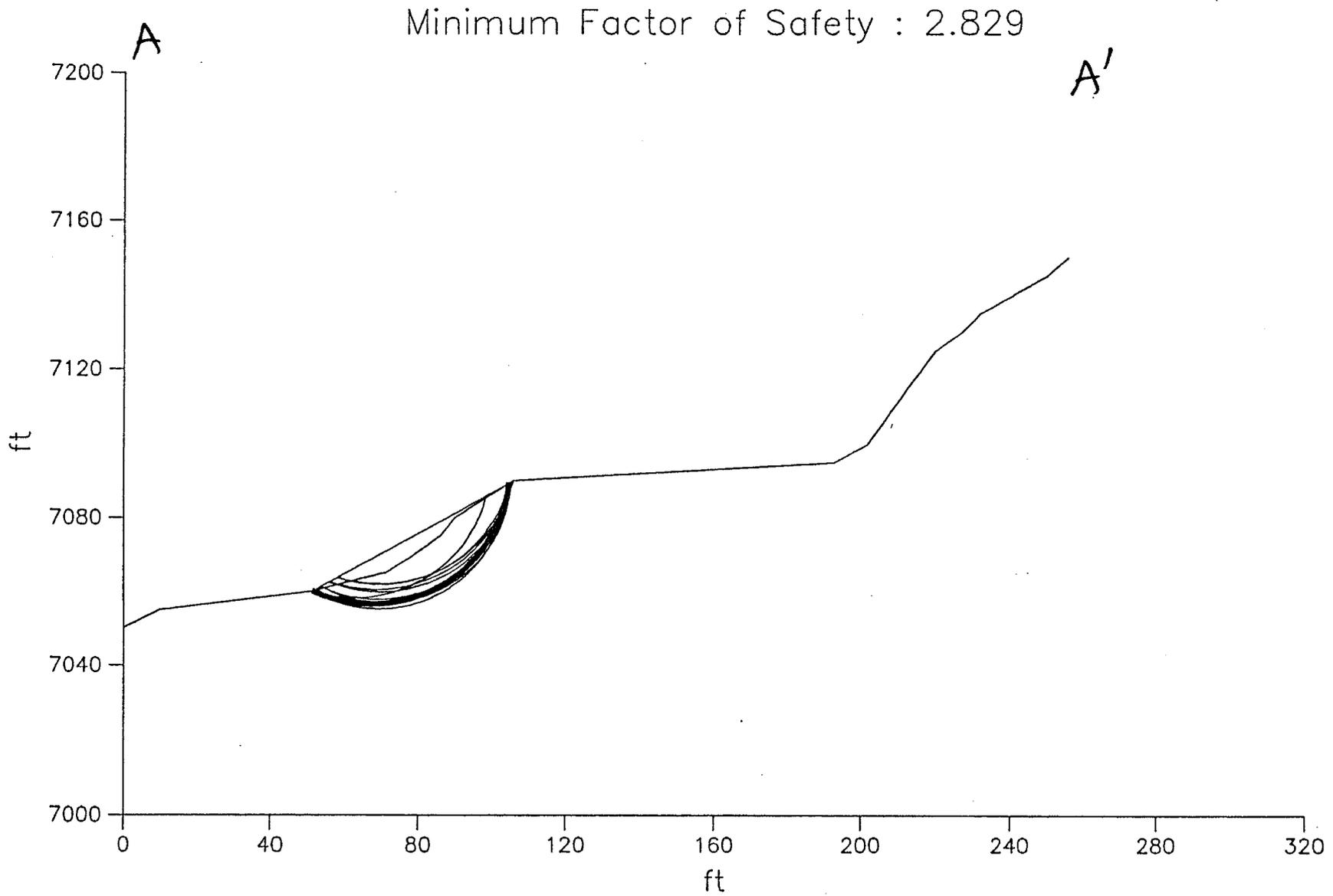
Factor of Safety : 2.829

□

# Circular Surfaces – Search for Critical Surfaces

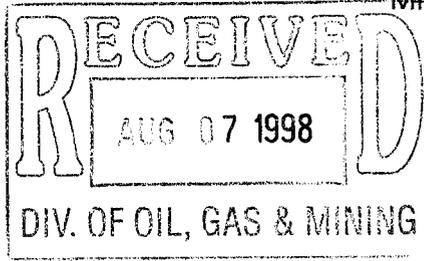


Circular Surfaces – Most Critical Surfaces



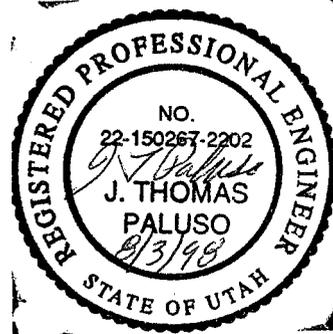
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine

Mining and Reclamation Plan  
August 1998



**APPENDIX 7-12**

NEW TEMPORARY WASTE ROCK STORAGE DIVERSION STRUCTURES



This appendix includes a figure illustrating the new temporary waste rock storage area, containment berm, silt fence locations, and surface runoff flow direction in the storage area and calculations supporting the design of the berms for a 100-year 6-hour storm event that produces 2.05 inches of precipitation. Silt fences are located down gradient of the storage area as shown on the attached figure to treat runoff from the berm and road.

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

RUNOFF FROM MINE WASTE ROCK PILE

by

Name: Gary E. Taylor

Company Name: CANYON FUEL CO., SKYLINE MINE  
File Name: C:\SEDCAD3\SPOIL

Date: 06-15-1998

Civil Software Design -- SEDCAD+ Version 3.1  
Copyright (C) 1987-1992. Pamela J. Schwab. All rights reserved.

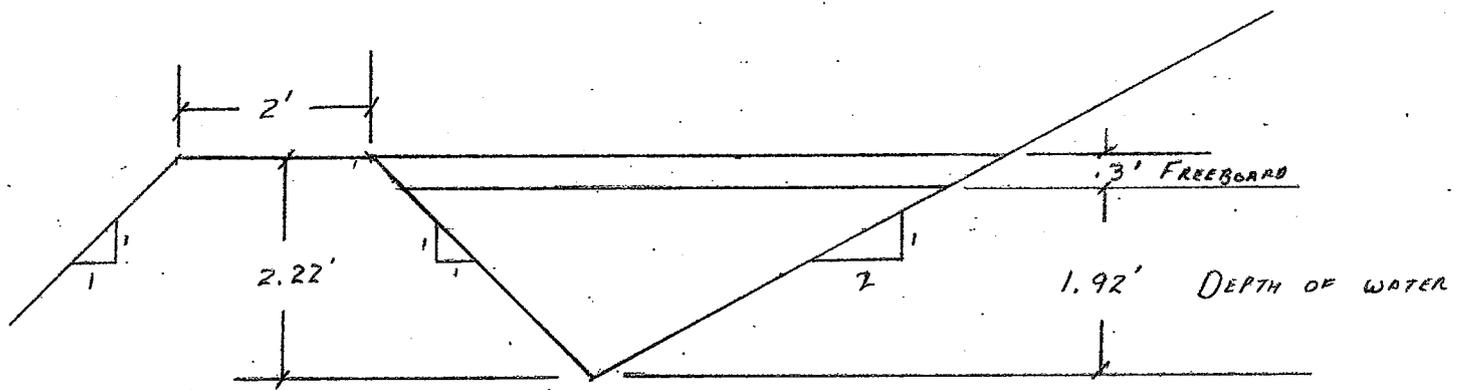
Company Name: CANYON FUEL CO., SKYLINE MINE  
Filename: C:\SEDCAD3\SPOIL User: Gary E. Taylor  
Date: 06-15-1998 Time: 15:41:04  
Runoff from Mine Waste Rock Pile  
Storm: 2.05 inches, 100 year- 6 hour, SCS Type II  
Hydrograph Convolution Interval: 1.0 hr

=====  
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE  
=====

-Hydrology-

JBS SWS	Area (ac)	CN UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)
111 1	0.33	85 M	0.030	0.000	0.000	0.0	0.02	0.44
		Type: Null	Label: spoil					
111 Structure	0.33						0.02	
111 Total IN/OUT	0.33						0.02	0.44

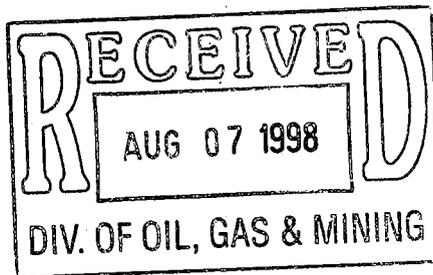
TYPICAL CROSS-SECTION  
OF CONFINEMENT AREA



22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS







**Surface Facilities.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of :

- At the approved waste-rock disposal facility at the SUFCo Mine (a sister operation of SCM);
- At the approved waste-rock disposal facility at the Skyline Mine (also a sister operation of SCM); or
- ? ● At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

Copies of the Division correspondence approving the SUFCo and Skyline waste-rock disposal facilities for receipt of Dugout Canyon waste rock are provided in Appendix 5-2.

Certified maps and cross sections concerning the disposal of underground development waste at the SUFCo and Skyline Mines are provided in the respective Mining and Reclamation Plans (M&RPs) for those mines. A certified map showing the proposed location of non-coal (non-waste rock) waste storage, coal storage and loading areas, and explosive storage and handling facilities, is provided as Plate 5-2A. Cross sections of the proposed facilities area are provided on Plate 5-2B. A location map, cross section, material description, volume calculation, and slope stability analysis for a temporary waste rock storage area to be utilized during site construction is included in Appendix 5-7.

A map of the existing topography prior to disturbance by SCM is provided as Plate 5-2C. Also noted on Plate 5-2C is the area of disturbance which was mapped to exist at the site in 1980. Since mining ceased at the site in 1964 (as noted earlier in this section), this boundary represents the area of pre-SMCRA disturbance. Plate 5-2C also shows areas of non-mining disturbance which occurred after 1980 but prior to 1996. These disturbances were created by logging activities in the area and are not subject to the requirements of R645-301 through R645-302. No areas shown on Plate 5-2C are subject to the requirements of R645-200 through R645-203.

A certified map showing the location of the topsoil stockpile is provided as Plate 2-3.

The proposed location of the sedimentation pond is noted on Plate 5-2A. No water treatment facilities will exist at the site other than the sewage leach field and the sedimentation pond.

The following facilities or activities will not exist or occur within the permit area:

- Coal preparation plant,
- Coal cleaning,
- Coal processing waste banks, dams, or embankments,
- Disposal of non-coal (non-waste rock) waste other than durable rock-type construction materials such as cinder block, and
- Air pollution control facilities.

Hence, certified maps or cross sections of these facilities are not provided in this plan. The durable rock-type construction materials will be disposed of in locations designated to receive underground development waste (i.e., at the approved waste-rock disposal facilities).

**Surface Configurations.** Certified maps and cross sections showing the proposed final (post-reclamation) surface configuration of the Dugout Canyon disturbed area are provided on Plates 5-3 and 5-4.

**Hydrology.** Certified maps and cross sections associated with the hydrology of the Dugout Canyon Mine area are provided in Chapter 7.

**Geology.** Certified maps and cross sections associated with the geology of the Dugout Canyon Mine area are provided in Chapter 6.

## **513 Compliance with MSHA Regulations and MSHA Approvals**

### **513.100 Coal Processing Waste Dams and Embankments**

No coal processing waste dams or embankments will exist within the permit area.

### **513.200 Impoundments and Sedimentation Ponds**

No impoundments or sedimentation ponds in the permit area will meet the size criteria of 30 CFR 77.216(a).

### **513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil**

No coal processing waste or excess spoil will be generated within the permit area. It is not anticipated that underground development waste will be disposed of in underground mine workings.

### **513.400 Refuse Piles**

Waste rock generated from the Dugout Canyon Mine may be temporarily stored on the surface of the mine site at the location shown on Plate 5-2A and the map in Appendix 5-7. This storage will be for a short period of time prior to ultimate disposal in the waste-rock disposal areas associated with the SUFCo, Skyline Mines and/or other permitted and approved sites. Waste rock will be disposed of after approximately 1500 CY of material accumulates or every 4 months, whichever is shorter. Runoff from the stored materials will drain to the site sedimentation pond or appropriate sediment control structures.

### **513.500 Underground Openings to the Surface**

Upon abandonment, each opening to the surface from the underground will be capped, sealed, backfilled, or otherwise properly managed in accordance with 30 CFR 75.1771. Details regarding final abandonment of mine openings are provided in Section 542.700.

### **513.600 Discharges to Underground Mines**

No discharges will occur from the surface to underground mine workings in the permit area.

### **513.700 Surface Coal Mining and Reclamation Activities**

No surface coal mining and reclamation activities will occur in the permit area.

### **513.800 Coal Mine Waste Fires**

If any coal mine waste fires occur within the permit area, these will be reported immediately to MSHA and the Division. Immediate remedial action will be taken as deemed necessary by SCM to protect public health and safety as well as the environment. Following initial remedial efforts, a long-term plan will be formulated in discussion with MSHA and the Division to extinguish any existing fires and prevent future fires.

SCM will utilize a program of prevention and suppression to minimize the potential for coal mine waste fires. An ongoing educational program will emphasize the need for attention to fire prevention. Prevention will be further enhanced by the short-term nature of the storage at the Dugout Canyon Mine. Suppression will occur by separating smoldering material and compacting the adjacent material (to minimize oxygen content in the adjacent material). The burning material will then be extinguished using appropriate methods (see Section 528.300

of this M&RP). No burning mine waste will be removed from the temporary storage area without a removal plan approved by the Division.

## **514 Inspections**

### **514.100 Excess Spoil**

Excess spoil will not be generated at the Dugout Canyon Mine.

### **514.200 Refuse Piles**

The frequency and methods of inspections of the waste-rock areas at the SUFCo and Skyline Mines is discussed in their respective M&RPs. Quarterly inspections will be made of the temporary waste-rock storage area at the mine site (see Plate 5-2A). These inspections will be performed by a professional engineer or a specialist experienced in the construction of similar earth and waste structures. The inspector will provide a certified report to the Division within two weeks after each inspection. The report will discuss any appearances of instability, structural weakness, or other hazardous conditions. A copy of this report will also be maintained at the mine site.

All activities performed at this area will be in accordance with the applicable MSHA permit.

### **514.300 Impoundments**

Regular inspections will be made during construction of the sedimentation pond and other impoundments as well as upon completion of construction. These inspections will be made

Plates 4-1 and 5-2A depict the location of an existing UP&L distribution line that will be improved and activated to provide electrical service to the mine. This distribution line, which is not classified as a major electric transmission line, will be owned and upgraded by UP&L.

As noted previously, waste rock which is generated at the Dugout Canyon Mine will be disposed of in the approved waste-rock disposal areas at the SUFCo and/or Skyline Mines.

The location of the sedimentation pond within the permit area is shown on Plate 5-2A. There will be no permanent water impoundments within the permit area.

**Landowner, Right-of-Entry, and Public Interest.** Figures 1-1 and 1-2 of Chapter 1 show the boundaries of lands and the names of present owners of record of surface lands and subsurface coal, respectively, included in or contiguous to the permit area. CFC has a legal right to enter and begin coal mining operations on all of the lands within the permit area, as noted in Chapter 1, Section 114 of this M&RP.

Coal mining and reclamation operations will be conducted within 100 feet of the right-of-way line of a public road (an as-yet unnumbered Carbon County road) only where the mine facilities road joins that right-of-way (i.e. at the downstream edge of the disturbed-area boundary).

As noted in Section 534.300, selection of the final alignment of the reconstructed county road will be the responsibility of Carbon County. It is anticipated that the county road will not be significantly realigned within the permit area. During mining and reclamation operations, this road will be used for mine access and coal haulage.

All roads upstream from the sedimentation pond are private roads.

Subsidence from underground mining operations is not projected to affect public lands where dirt roads exist within the permit and adjacent areas (see Section 525.100 of this M&RP).

### **528.200 Overburden**

No overburden will be removed, handled, stored, or transported within the permit area.

### **528.300 Spoil, Coal Processing Waste, Non-Coal Waste, and Mine Development Waste**

**Excess Spoil.** No spoil will be generated at the Dugout Canyon Mine. Sediment removed from the sedimentation pond will be handled in accordance with Section 732.200 of this M&RP.

**Coal Processing Waste.** SCM will not process their coal at the Dugout Canyon Mine beyond crushing and screening. Thus, no coal processing waste will be generated in the permit area.

**Burning and Burned Waste Utilization.** As noted below and in Section 536 of this M&RP, waste rock generated from the Dugout Canyon Mine will be disposed of at permitted facilities located at the SUFCo, Skyline Mines, or other permitted waste rock disposal sites provided the M&RP for those sites will allow for disposal of Dugout Canyon Mine waste rock. If coal mine waste fires occur at the permitted disposal sites, they will be controlled in the manner outlined in their respective permits.

Waste rock will only be temporarily stored at the surface of the Dugout Canyon Mine prior to ultimate disposal or use. If spontaneous combustion of this material does occur, the burning section will be removed from the remainder of the pile using a backhoe or other appropriate means. The affected waste rock will then be spread so that the material can cool and mixed with soil to extinguish the fire. The extinguished material will then be returned to the waste pile.

**Non-Coal Mine Waste.** Non-coal (non-waste rock) waste generated in the permit area will be temporarily stored in a dumpster to be situated at a convenient location within the disturbed

area. This dumpster will be located adjacent to the trailers shown on Plate 5-2A northeast of the coal pile. This waste will be disposed of periodically through Carbon County at a permitted landfill.

Liquid wastes such as oil and solvents will be contained and disposed of or recycled, in accordance with applicable State and Federal regulations, at facilities which are permitted to accept such wastes. Small quantities of such wastes (e.g., resulting from cleanup of small spills, etc.) may be contained onto absorbent pads prior to disposal. In all cases, disposal and/or recycling will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

No non-coal (non-waste rock) waste will be permanently disposed of within the permit area. Non-coal (non-waste rock) waste will be temporarily stored at the site prior to permanent off-site disposal either in a dumpster or in the temporary waste-rock storage area. Off-site disposal will be only at sites which are permitted by appropriate regulatory authorities to accept such waste.

It is currently anticipated that no non-coal waste that is defined as hazardous under 40 CFR 261 will be generated at the mine. If such waste is generated in the future, it will be handled in accordance with the requirements of Subtitle C of the Resource Conservation and Recovery Act and any implementing regulations.

**Underground Development Waste.** Underground development waste which is generated at the Dugout Canyon Mine will be disposed of either:

- At the approved water-rock disposal facility at the SUFCo Mine;
- At the approved waste-rock disposal facility at the Skyline Mine;
- At an approved and permitted waste-rock disposal facility provided the facility's M&RP allows for such disposal.

**Road Maintenance.** The county road will be maintained by Carbon County.

**Road Culverts.** All culverts along the county road will be designed, installed, and maintained by Carbon County. Culverts to be installed within the surface facilities have been designed in accordance with the hydrologic criteria discussed in Section 742.300. These culverts will be installed in accordance with manufacturer's recommendations to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

### **535 Spoil**

No spoil will be generated in the permit area. No valley fills or head-of-hollow fills will be created for the disposal of spoil material. Furthermore, no excess spoil will be disposed of in pre-existing benches.

### **536 Coal Mine Waste**

Coal mine waste resulting from mining activities at the Dugout Canyon Mine will be disposed of at an approved waste-rock disposal facilities such as those operated at the SUFCo Mine or at the Skyline Mine. Both of these are sister operations of SCM. Descriptions of the aforementioned waste-rock disposal facilities are presented in the respective M&RPs.

The coal mine waste generated from the Dugout Canyon Mine may be temporarily stored on the surface of the Dugout Canyon Mine facilities at the location shown on Plate 5-2A prior to ultimate disposal. Coal mine waste which is stored at the mine site will be removed from the temporary waste-rock storage area and placed in its final disposal area at the frequency noted in Section 513.400 of this M&RP. Runoff from the temporary waste-rock storage area will report to the mine-site sedimentation pond and be treated accordingly. During the period of temporary storage, berms will be installed around the temporary storage area to contain and direct runoff to ditch DD-2a (see Plate 7-5). The berms around the temporary waste-rock

storage area are not noted on Plate 7-5 or elsewhere since these will be located as necessary, depending upon the extent of the waste-rock storage.

### **536.100 Design**

The waste-rock disposal facilities at the SUFCo Mine and Skyline Mine were designed to achieve minimum long-term static safety factors of at least 1.5. These designs and the associated evaluations were based on the results of detailed foundation and laboratory analyses of soils at the sites of the disposal facilities.

Due to the temporary nature of the waste-rock storage area shown on Plate 5-2A, the long-term static safety factor of this material has not been evaluated. Foundation conditions beneath the pad on which the waste rock will be temporarily stored are discussed in Chapter 2 and Appendix 5-4 of this M&RP.

### **536.200 Waste Emplacement**

Waste rock from the Dugout Canyon Mine that is to be hauled to the SUFCo, Skyline Mine, or other approved disposal sites will be emplaced in accordance with the respective M&RPs. This waste will be placed in a controlled manner to ensure the mass stability of the waste piles and prevent mass movement during and after construction. The waste rock will be covered periodically to minimize public hazards and the potential for spontaneous combustion.

Waste rock will be emplaced in the temporary storage *areas* at the Dugout Canyon Mine using front-end loaders and other appropriate earth-moving equipment. Due to the temporary nature of this storage, mass movement, public hazards, and spontaneous combustion of the material will not occur prior to its ultimate disposal.

### **536.800 Coal Processing Waste Banks, Dams, and Embankments**

No coal processing waste banks, dams, or embankments will exist within the permit area.

### **536.900 Refuse Piles**

A detailed description of the waste-rock disposal sites at the SUFCo, Skyline Mines, and other potential permitted disposal sites is provided in their respective M&RPs. These M&RPs provide:

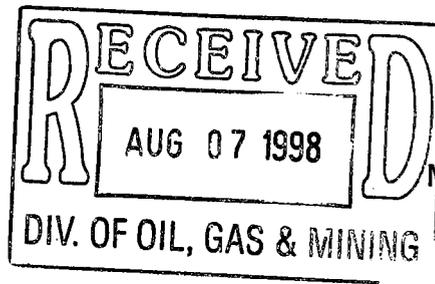
- A description of pre-disturbance soils at the sites;
- Certification of the design and plans;
- Compliance with applicable MSHA regulations;
- A description of proposed inspection activities;
- A description of the design, stability, operation, and reclamation of the waste-rock sites; and
- A discussion of runoff- and sediment-control plans associated with the sites.

The suitability of the waste rock to be generated from the Dugout Canyon Mine for reclamation is discussed in Chapters 2 and 6 of this M&RP.

With respect to the temporary waste-rock disposal area designated on Plate 5-2A, the following information can be found in the indicated sections of this M&RP:

- A description of pre-disturbance soils at the sites - Chapter 2
- A description of the suitability of the waste rock for reclamation - Chapters 2 and 6
- Certification of the design and plans - Section 512

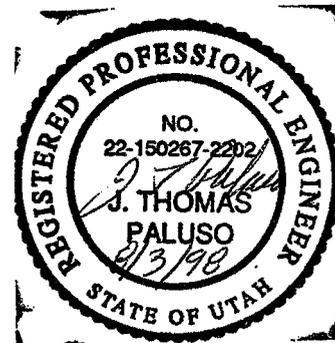
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

**APPENDIX 5-7**

**NEW TEMPORARY WASTE ROCK STORAGE LOCATION INFORMATION**



This appendix includes the following items:

- A description of the material to be stored,
- A brief material handling description,
- Stockpile capacity,
- A cross section of the temporary waste rock pile,
- Chemical analysis of the waste rock to be stored.

The description of the material and material handling plan follows below while the remaining three items are included in the attached pages.

#### Material Description:

The waste rock material consists of shale, siltstone, and sandstone fragments. This material has fallen from the roof of the mine over the past 40 years. The material consists of angular sand, gravel, and cobble size clasts. Acid- and toxic-forming analysis results have been included in the attached pages. As noted on the cross section sheet, the storage volume is 1926 CY.

#### Material Handling:

The waste rock will be scooped and loaded underground using underground mining equipment. The waste rock will then be brought to the surface and dumped over the existing pad slope as shown in the attached figure. As waste rock accumulates on and at the base of the slope, appropriate earthmoving equipment will be used to distribute the waste rock within the containment area. This will allow for the maximum storage volume to be achieved and reduce the risk of creating unstable slopes. Every 1000 tons of waste rock removed will be tested for acid- and toxic- forming characteristics after it has been stored at the surface for approximately two weeks. If it is not found to have acid- or toxic-forming characteristics, it may be used for fill during mine site construction activities. It will be placed and compacted as fill following the methods described in the approved M&RP. If the waste rock is found to be unsuitable as fill, it will be transported to either the SUFCo or Skyline Mine waste rock storage areas as approved in the M&RP.

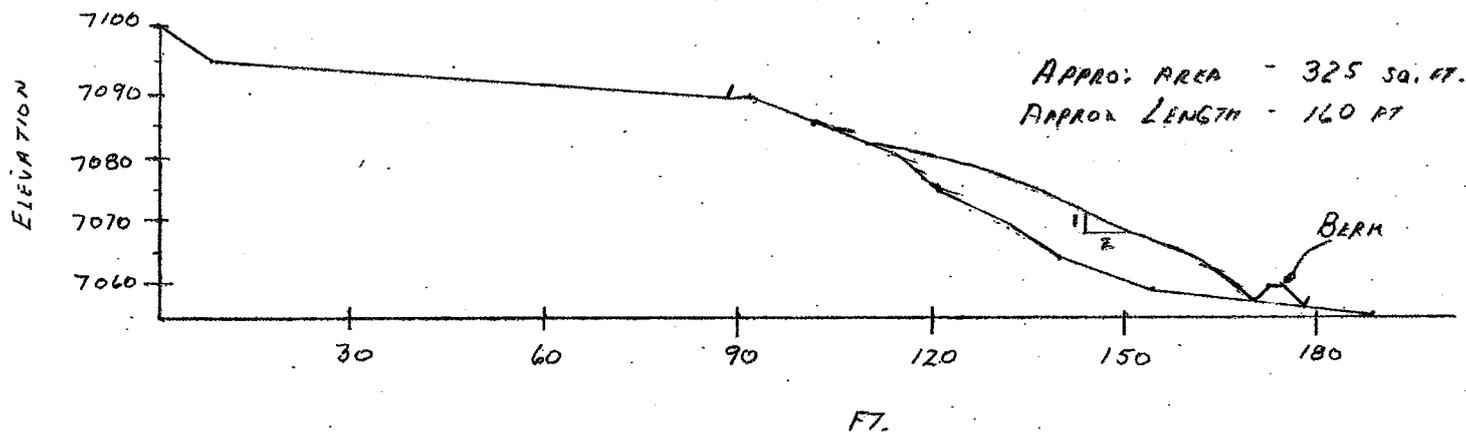


TYPICAL CROSS-SECTION  
TEMPORARY WASTE ROCK  
STORAGE AREA

18 June 1998

G. Taylor

$$\text{VOLUME} = 325 \text{ SQ. FT.} \times 160 \text{ FT.} / 27 \text{ CU. FT. / CU. YD.}$$
$$= 1926 \text{ CU. YD.}$$



SCALE 1" = 30' H AND V

22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS





Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 1 of

Lab No.	Location	Depth feet	pH	EC mmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124887	ROCK CYN ROOF	0.0-0.0	7.8	1.53	24.2	3.49	8.06	4.34	1.81		72.4	20.0	7.6	SANDY LOAM
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124889	COAL	0.0-0.0	8.4	0.97	58.4	0.42	0.46	8.02	12.1		88.4	9.0	2.6	SAND
124890	GILSON ROOF	0.0-0.0	7.5	0.66	28.1	2.34	2.79	0.88	0.55		39.4	41.0	19.6	LOAM
124891	FLOOR	0.0-0.0	7.8	1.58	23.4	3.35	8.76	4.57	1.86		69.4	22.0	8.6	SANDY LOAM
124892	COAL	0.0-0.0	7.2	2.30	56.7	23.2	5.68	0.85	0.22		88.4	8.0	3.6	SAND

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P004/009

TO SKYLINE

06-11-98 12:14PM FROM 801 637 0108



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WRELLINGTON, UTAH

August 24, 1995

Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124887	ROCK CYN ROOF	0.0-0.0	3.6	0.17	5.31	181.	176.					
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124889	COAL	0.0-0.0	93.3	0.38	11.9	43.6	31.7					
124890	GILSON ROOF	0.0-0.0	4.9	0.02	0.62	1.74	1.12					
124891	FLOOR	0.0-0.0	4.5	0.09	2.81	173.	171.					
124892	COAL	0.0-0.0	93.3	0.45	14.1	23.8	9.69					

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur,  
Neut. Pot.= Neutralization Potential

P005/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 3 of

Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124887	ROCK CYN ROOF	0.0-0.0	1.02	0.28	0.02	0.37	0.26	2.24	0.03	9.6	2.4
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124889	COAL	0.0-0.0	1.22	1.64	<0.02	0.69	0.22	1.30	0.77	9.5	8.1
124890	GILSON ROOF	0.0-0.0	1.20	0.97	0.08	0.28	0.26	8.62	0.04	14.9	4.1
124891	FLOOR	0.0-0.0	1.26	0.28	0.02	0.38	0.27	2.40	0.03	13.7	2.9
124892	COAL	0.0-0.0	1.20	1.77	<0.02	0.39	0.34	1.38	0.74	17.8	7.9

P006/009

TO SKYLINE

FROM 801 637 0108

U6-11-98 12:14PM

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 1 of

Lab No.	Location	Depths feet	pH	EC mmhos/cm @ 25°C	Satur- ation %	Calcium meq/l	Magnesium meq/l	Sodium meq/l	SAR	Coarse Fragments %	Sand %	Silt %	Clay %	Texture
124888	FLOOR	0.0-0.0	7.7	0.95	35.5	4.46	5.04	0.66	0.30		68.4	22.0	9.6	SANDY LOAM
124894	124888(DUP)	0.0-0.0	7.8	0.94	35.6	4.18	4.53	0.80	0.38		67.4	23.0	9.6	SANDY LOAM

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P007/009

TO SKYLINE

06-11-98 12:14PM FROM 801 637 0108



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 2 of

Lab No.	Location	Depths feet	Total Organic Carbon %	Total Sulfur %	T.S. AB t/1000t	Neut. Pot. t/1000t	T.S. ABP t/1000t	Sulfate Sulfur %	Pyritic Sulfur %	Organic Sulfur %	PyrS AB t/1000t	PyrS ABP t/1000t
124888	FLOOR	0.0-0.0	1.8	0.02	0.62	88.2	87.5					
124894	124888(DDP)	0.0-0.0	1.6	0.02	0.62	92.0	91.4					

Abbreviations used in acid-base accounting: T.S. = Total Sulfur, AB = Acid Base, ABP = Acid Base Potential, PyrS = Pyritic Sulfur, Pyr+Org = Pyritic Sulfur + Organic Sulfur,  
Neut. Pot. = Neutralization Potential

P008/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM



Inter-Mountain Laboratories, Inc.

1633 Terra Avenue

Sheridan, Wyoming 82801

Tel. (307) 672-8945

SOLDIER CREEK COAL COMPANY  
WELLINGTON, UTAH

August 24, 1995

Page 3 of

Lab No.	Location	Depths feet	Nitrate- Nitrogen ppm	Boron ppm	Selenium ppm	Avail Na meq/100g	Exch Na meq/100g	CEC meq/100g	Total Kjeldahl Nitrogen %	1/3 bar	15 bar
124888	FLOOR	0.0-0.0	1.26	0.29	<0.02	0.28	0.26	3.42	0.02	10.3	3.0
124894	124888(DUP)	0.0-0.0	1.04	0.28	<0.02	0.28	0.25	3.54	0.02	14.6	2.8

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, Exch= Exchangeable, Avail= Available

P009/009

TO SKYLINE

FROM 801 637 0108

06-11-98 12:14PM

Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine

Mining and Reclamation Plan  
August 1998

## **SLOPE STABILITY ANALYSIS**

July 27, 1998



**EarthFax**

Mr. Chris Hansen  
Canyon Fuel Company, LLC  
Skyline Mine  
P.O. Box 719  
Helper, UT 84526

EarthFax  
Engineering Inc.  
Engineers/Scientists  
7324 So. Union Park Ave.  
Suite 100  
Midvale, Utah 84047  
Telephone 801-561-1555  
Fax 801-561-1861

**Subject: Stability of Temporary Waste-Rock Pile  
at the Dugout Canyon Mine**

Dear Chris:

Pursuant to your request, we have evaluated the stability of the temporary waste-rock pile at the Dugout Canyon Mine in Carbon County, Utah. This pile has been created from the sidecast of roof-fall and other rock materials being cleaned from the old Dugout Canyon portals. The material has been sidecast off the old portal pad to an area adjacent to the dirt road which exists at an elevation approximately 20 to 25 feet lower than the pad. This analysis was performed to address the concerns expressed by the Utah Division of Oil, Gas and Mining at a recent site meeting.

A sample of the sidecast waste rock was collected and submitted to Applied Geotechnical Engineering Consultants, Inc. for analyses of the following physical properties:

- Particle-size analysis (ASTM D-422)
- Atterberg limits (ASTM D-4318)
- Direct shear (ASTM D-3080)
- Standard Proctor (ASTM D-698)

Results of these analyses are presented in Attachment A. According to these analyses, the waste rock is coarse-grained, with approximately 95 percent retained on the No. 200 sieve (i.e., sand fraction or larger) and approximately 82 percent being retained on the No. 4 sieve (i.e., gravel fraction). The material has further been classified as poorly-graded, with a Unified Soil Classification of GP-GM. The sample had an internal angle of friction of 35 degrees and a cohesive strength of 490 pounds per square foot.

Slope-stability analyses were performed using the computer program GEOSLOPE (Version 5.0), which is based on the FORTRAN program STABL3, developed at Purdue University. GEOSLOPE utilizes the limit equilibrium procedure of slices (Simplified Bishop's method) to determine the safety factor of potential failure surfaces for circular shapes.

Given the lack of seepage from the pad outslope, the slope-stability analyses were conducted based on unsaturated conditions. The materials were assumed to drain rapidly with no excess pore pressures developing in response to strains and stress changes.

Mr. Chris Hansen  
July 27, 1998  
Page 2

The engineering properties of the pad and other soil materials at the site were obtained from Appendix 5-4 of the Dugout Canyon Mine Phase II Mining and Reclamation Plan. Two conditions were evaluated

- Condition I - failure surfaces were allowed to begin and end in the road and pad areas, outside of the waste rock,
- Condition II - failure surfaces were allowed to begin and end only within the waste rock.

Results of the slope-stability analyses are presented in Attachment B. As indicated, the minimum safety factor for Condition I was determined to be 2.67. The minimum safety factor under Condition II is 2.83. Hence, the waste rock and the adjacent slope are stable.

Please contact me if you have any questions.

Sincerely,



Richard B. White, P.E.  
President

Attachments



Mr. Chris Hansen  
July 27, 1998  
Page 3

**ATTACHMENT A**

Results of Waste-Rock Analyses



Applied Geotechnical Engineering Consultants, Inc.

July 15, 1998

Earthfax Engineering  
7324 South 1300 East, Suite 100  
Midvale, UT 84047

Attention: Richard B. White  
Subject: Soils Laboratory Testing  
AGEC Project No. 973301

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to provide laboratory testing on a sample received July 2, 1998. The following tests have been performed in general accordance with the test method listed.

Test	Test Method
Particle Size Analysis	ASTM D-422
Atterberg Limits	ASTM D-4318
Direct Shear	ASTM D-3080
Standard Proctor	ASTM D-698

The results of the laboratory testing are shown graphically in Figures 1-2. The direct shear test specimens were remolded to approximately 90% of the standard proctor maximum dry density near optimum moisture content. Only material passing the #4 sieve was used in direct shear testing.

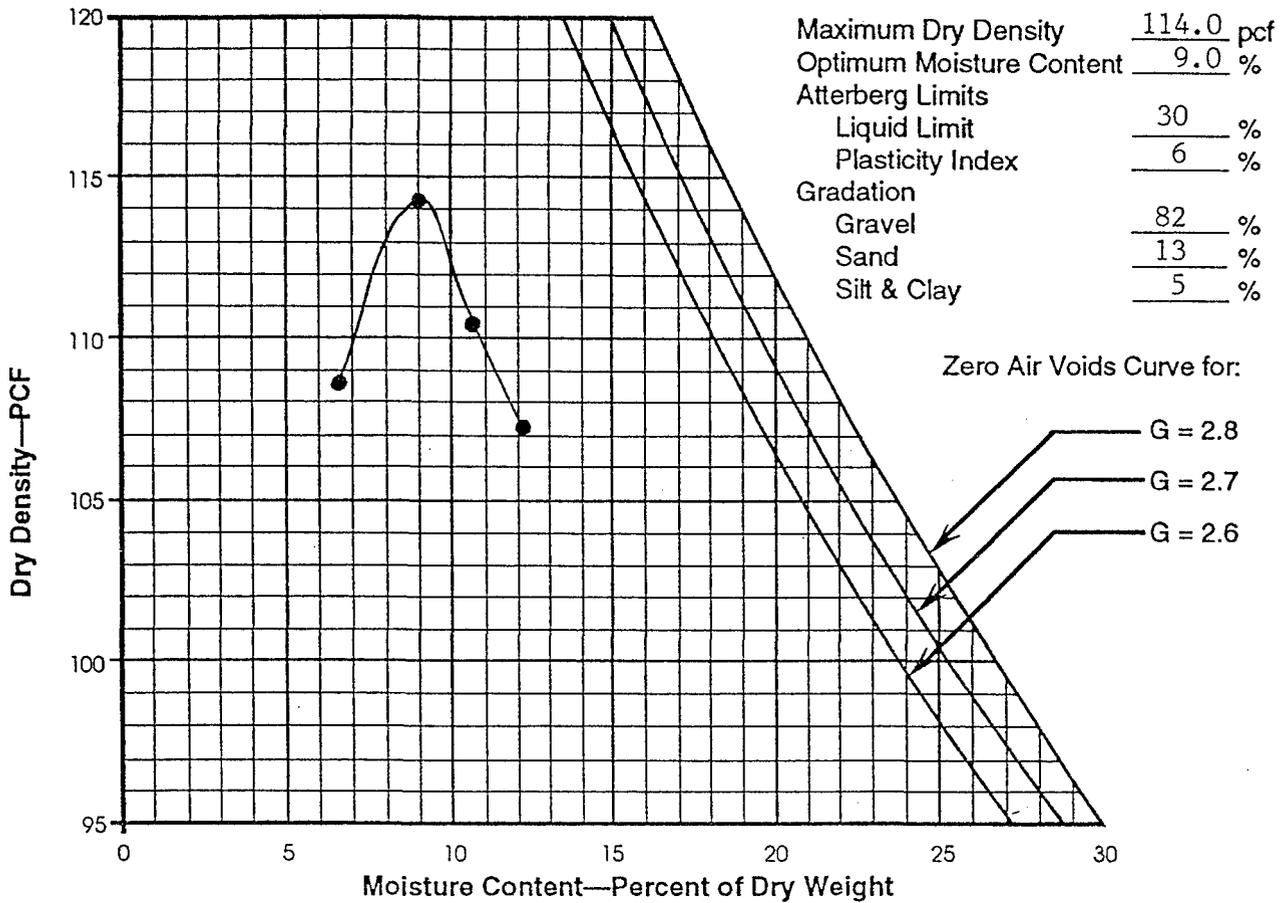
If you have any questions, or if we can be of further service, please call.

Sincerely,

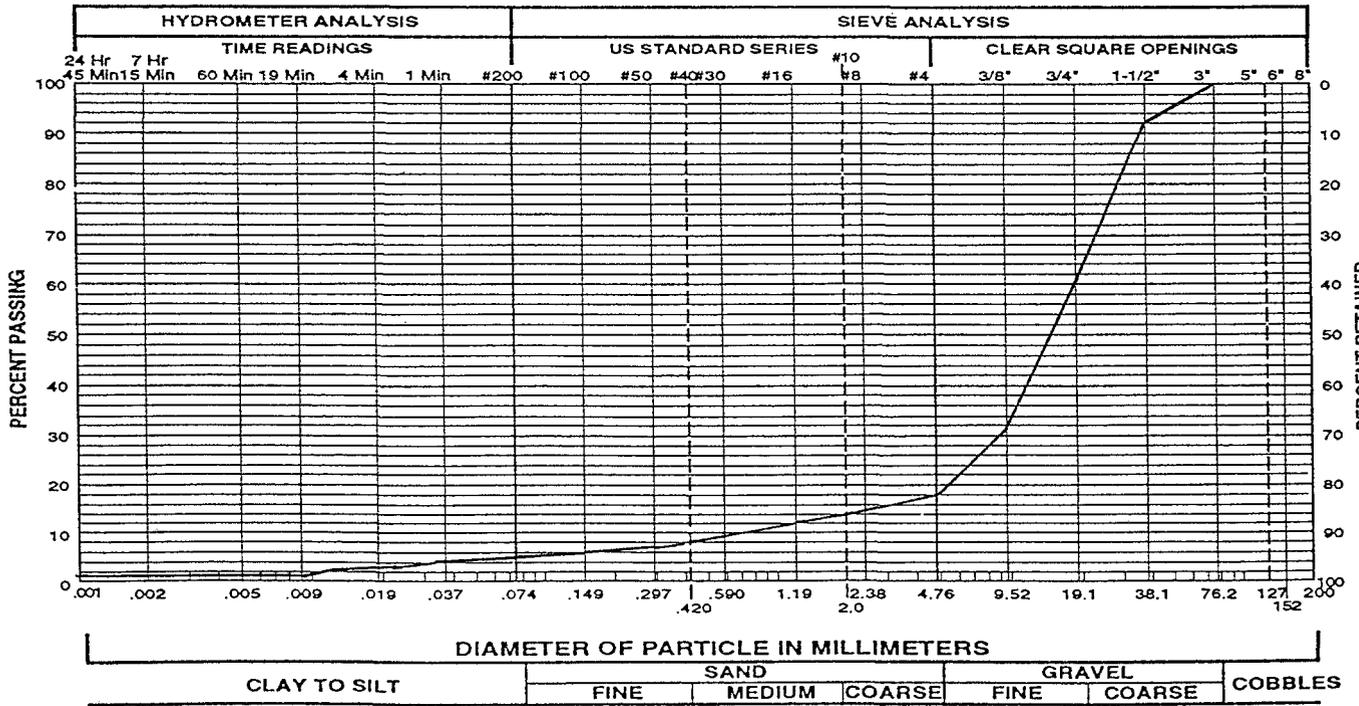
APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

  
Stephanie Francom  
Rev. SDA, E.I.T.

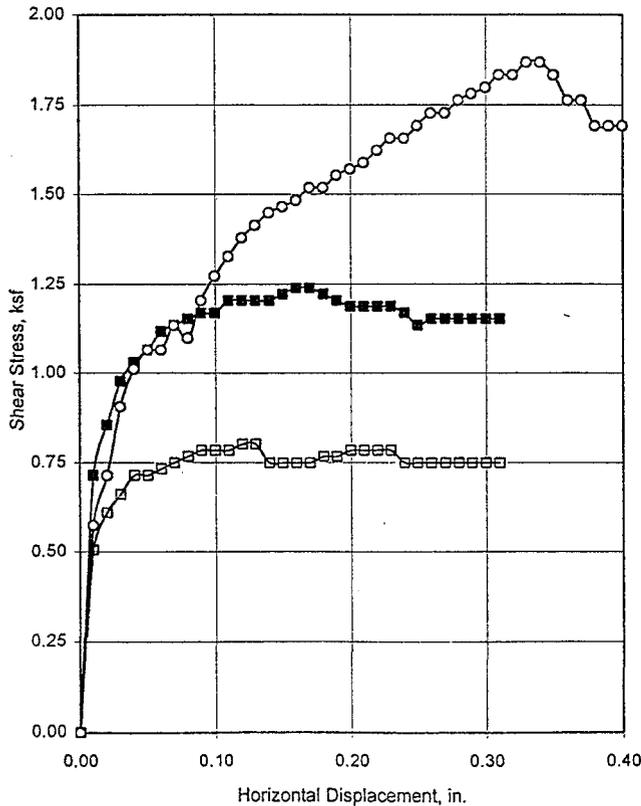
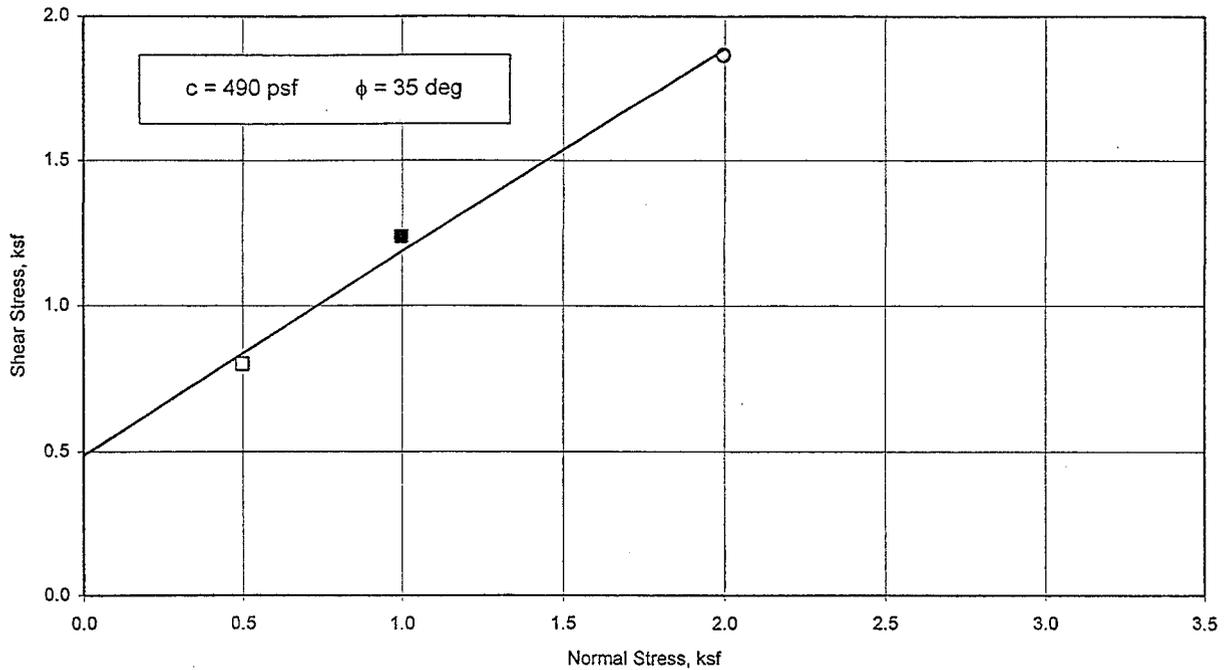
# Applied Geotechnical Engineering Consultants, Inc.



Compaction Test Procedure ASTM D-698 Method D  
 Sample of: Poorly-Graded Gravel with Silt (GP-GM) From: DCM-1 (7/6/98)



# Applied Geotechnical Engineering Consultants, Inc.



Test No. (Symbol)	1(□)	2(■)	3(O)
Sample Type	Remolded		
Length, in.	0.75	0.75	0.75
Diameter, in.	1.93	1.93	1.93
Dry Density, pcf	112	112	112
Moisture Content, %	9	9	9
Consolidation Load, ksf	0.5	1.0	2.0
Normal Load, ksf	0.5	1.0	2.0
Shear Stress, ksf	0.80	1.24	1.87
Remarks	Strain Rate 0.05 in/min. Only soil passing the #4 sieve was used in test.		

Sample Index Properties	
Dry Density, pcf	N/A
Moisture Content, %	N/A
Liquid Limit, %	30
Plasticity Index, %	6
Percent Gravel	82
Percent Sand	13
Percent Passing No. 200 Sieve	5

Type of Test Consolidated Undrained/Saturated  
 Sample Description Poorly Graded Gravel with Silt (GP-GM) From DCM-1

Project No. 973301

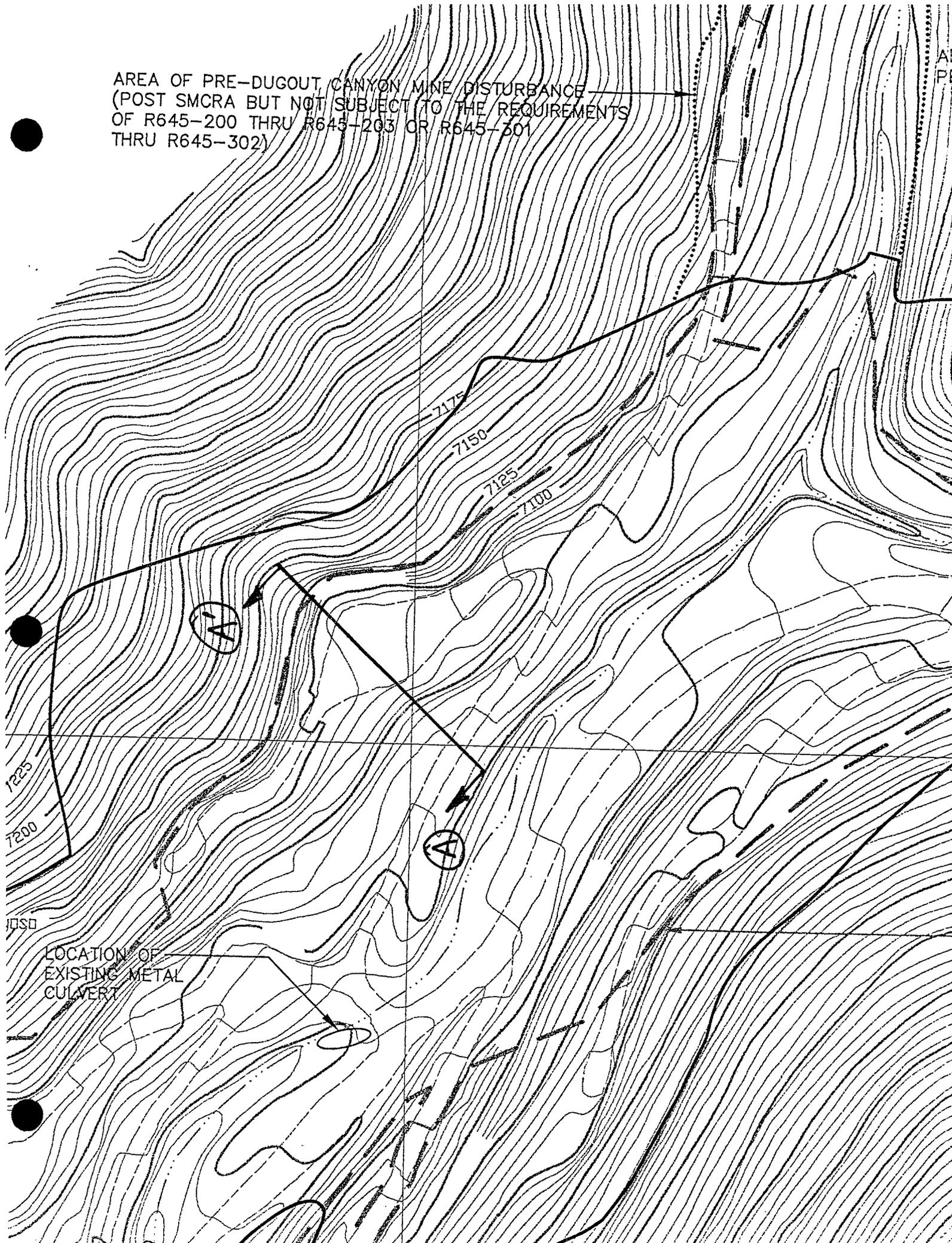
## DIRECT SHEAR TEST RESULTS

Figure 2

**ATTACHMENT B**

Results of Slope-Stability Analyses

AREA OF PRE-DUGOUT CANYON MINE DISTURBANCE  
(POST SMCRA BUT NOT SUBJECT TO THE REQUIREMENTS  
OF R645-200 THRU R645-203 OR R645-301  
THRU R645-302)



LOCATION OF  
EXISTING METAL  
CULVERT

GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY

Remarks :

*Failure surfaces can begin and  
end outside of the waste rock*

INPUT DATA

Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

Soil Parameters

Number of Soil Types : 2

TRIAL SURFACE GENERATION

Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 30.00 ft  
Right Initiation Point : 69.00 ft  
Left Termination Point : 70.00 ft  
Right Termination Point : 120.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

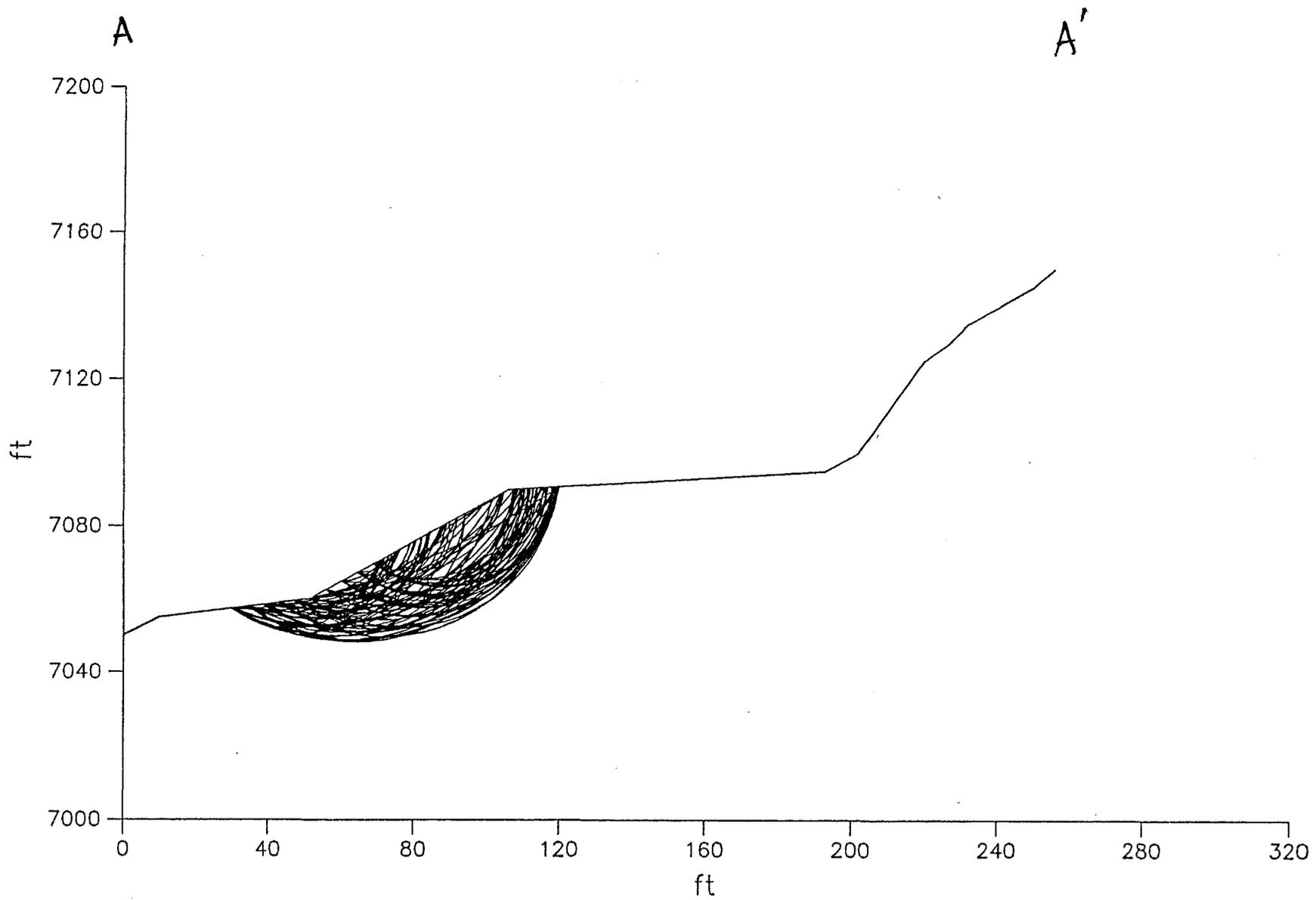
RESULTS

Critical Surface

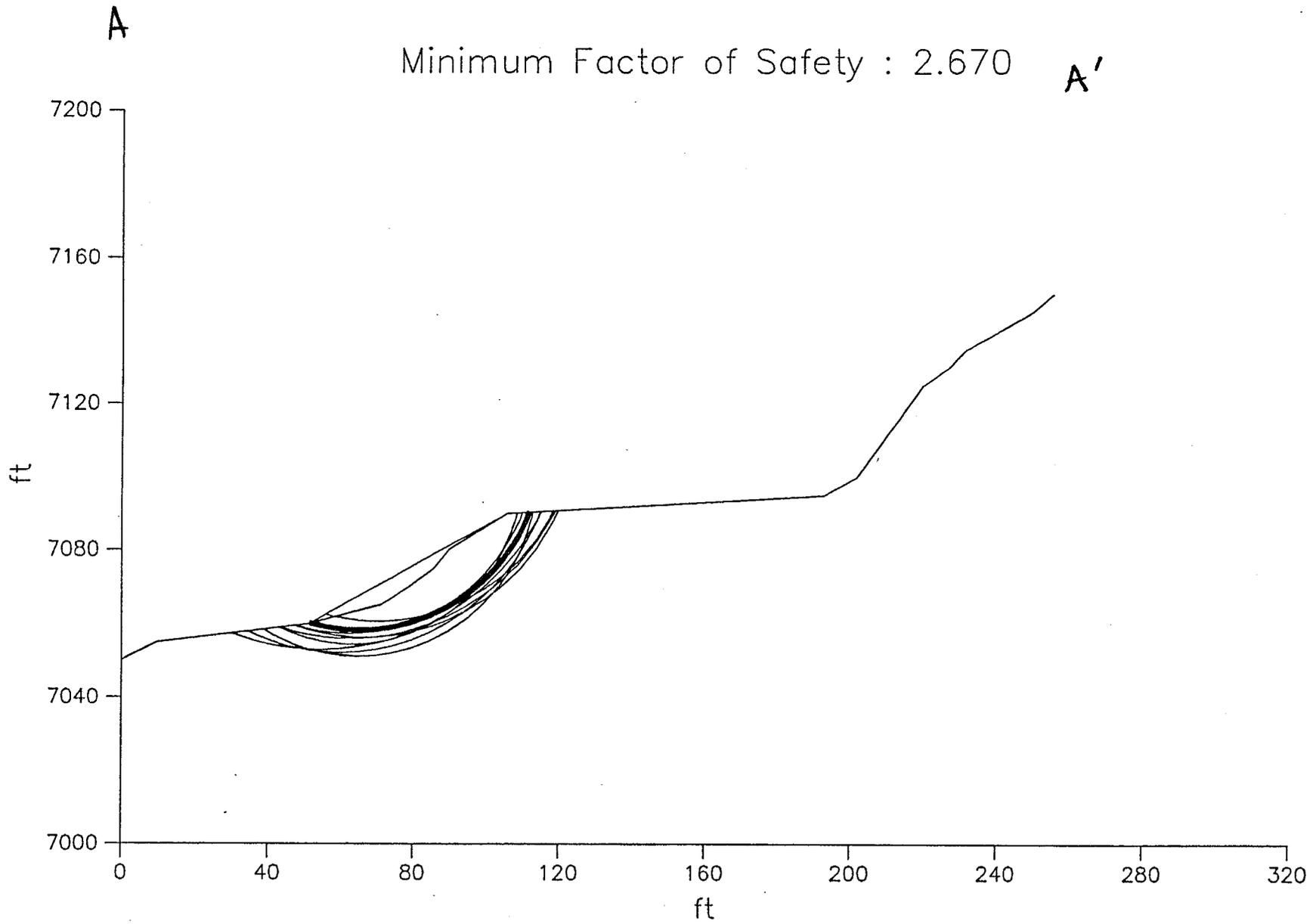
Factor of Safety : 2.670

□

# Circular Surfaces – Search for Critical Surfaces



Circular Surfaces – Most Critical Surfaces



GeoSlope  
Version 5.00

(c)1992 by GEOCOMP Corp, Concord, MA  
Licensed to EarthFax Engineering

Problem Title : DUGOUT CANYON MINE

Description : PAD STABILITY -

Remarks :

*Failure surfaces can begin and end  
in the waste rock only*

INPUT DATA

Profile Boundaries

Number of Boundaries : 17  
Number of Top Boundaries : 11

Soil Parameters

Number of Soil Types : 2

TRIAL SURFACE GENERATION

Data for Generating Circular Surfaces

Number of Initiation Points : 10  
Number of Surfaces From Each Point : 10  
Left Initiation Point : 51.50 ft  
Right Initiation Point : 71.50 ft  
Left Termination Point : 86.00 ft  
Right Termination Point : 106.00 ft  
Minimum Elevation : 0.00 ft  
Segment Length : 3.00 ft  
Positive Angle Limit : 20.00 deg  
Negative Angle Limit : -35.00 deg

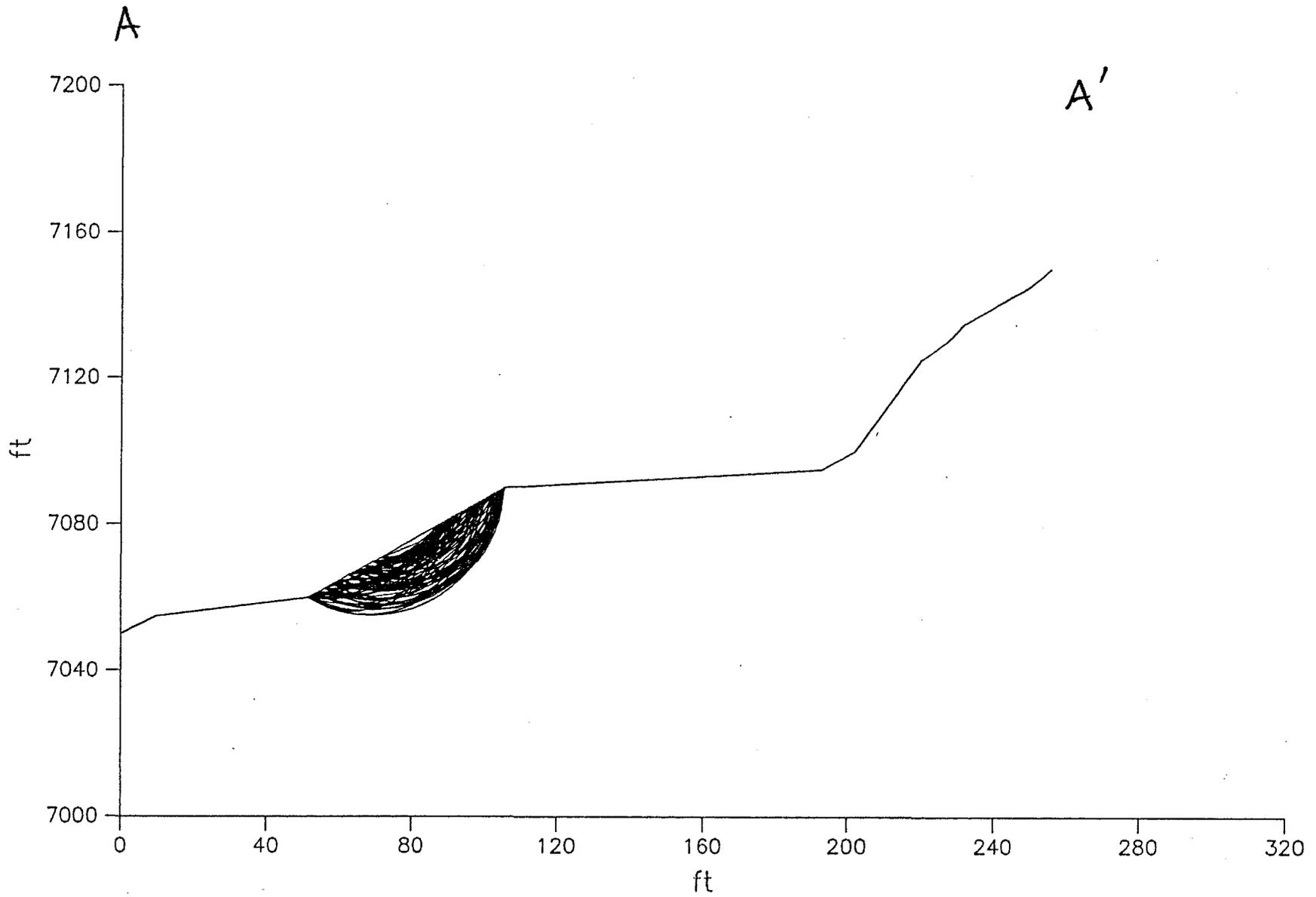
RESULTS

Critical Surface

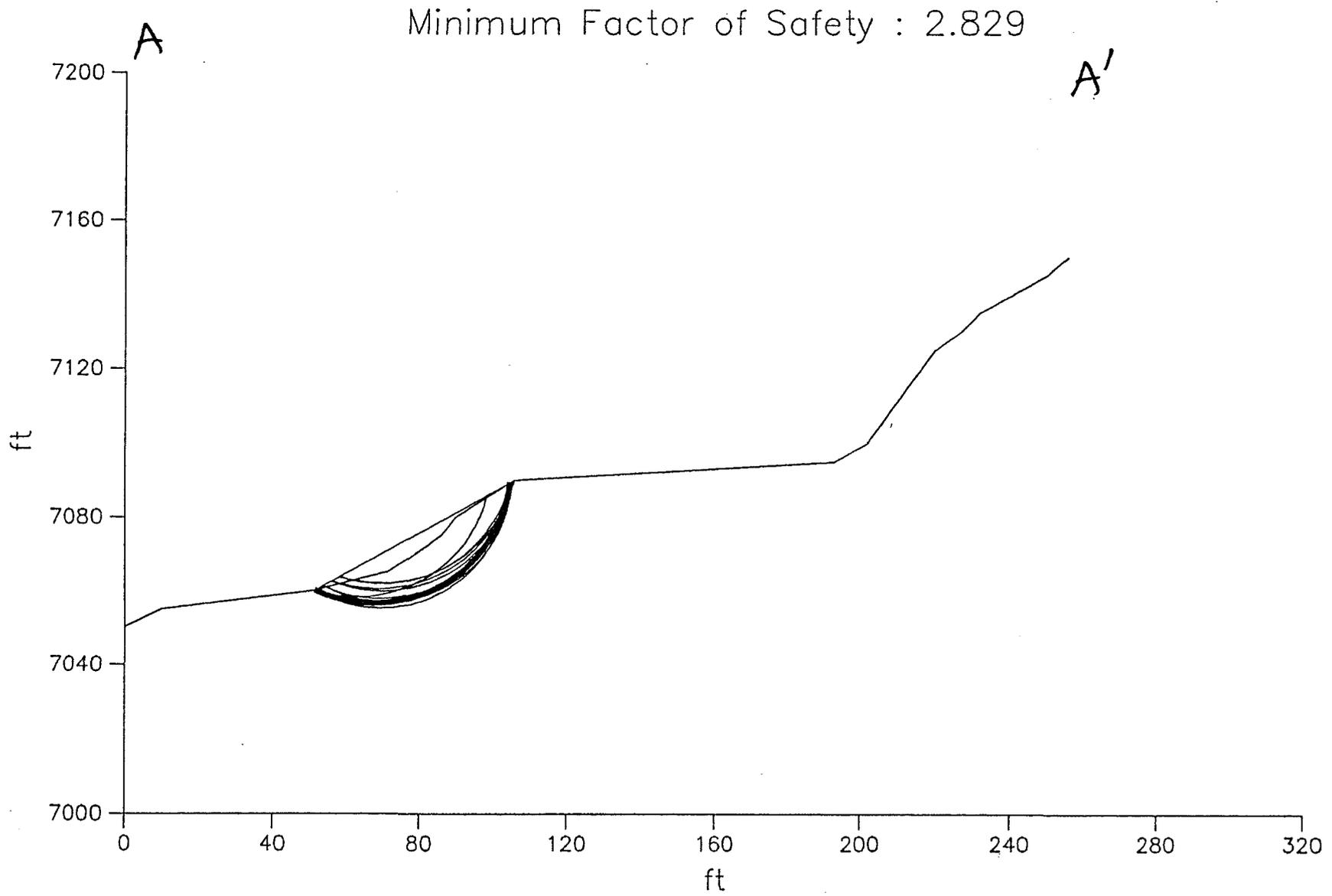
Factor of Safety : 2.829

□

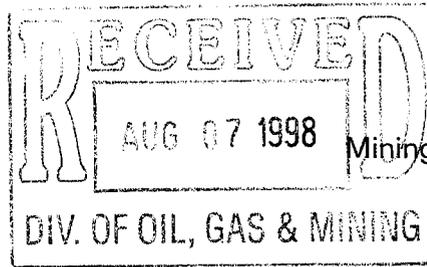
# Circular Surfaces – Search for Critical Surfaces



Circular Surfaces – Most Critical Surfaces



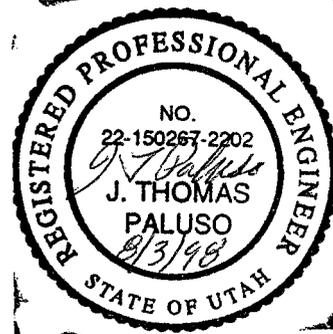
Canyon Fuel Company, LLC  
SCM/Dugout Canyon Mine



Mining and Reclamation Plan  
August 1998

**APPENDIX 7-12**

**NEW TEMPORARY WASTE ROCK STORAGE DIVERSION STRUCTURES**



This appendix includes a figure illustrating the new temporary waste rock storage area, containment berm, silt fence locations, and surface runoff flow direction in the storage area and calculations supporting the design of the berms for a 100-year 6-hour storm event that produces 2.05 inches of precipitation. Silt fences are located down gradient of the storage area as shown on the attached figure to treat runoff from the berm and road.

CIVIL SOFTWARE DESIGN

SEDCAD+ Version 3

RUNOFF FROM MINE WASTE ROCK PILE

by

Name: Gary E. Taylor

Company Name: CANYON FUEL CO., SKYLINE MINE  
File Name: C:\SEDCAD3\SPOIL

Date: 06-15-1998

Civil Software Design -- SEDCAD+ Version 3.1  
Copyright (C) 1987-1992. Pamela J. Schwab. All rights reserved.

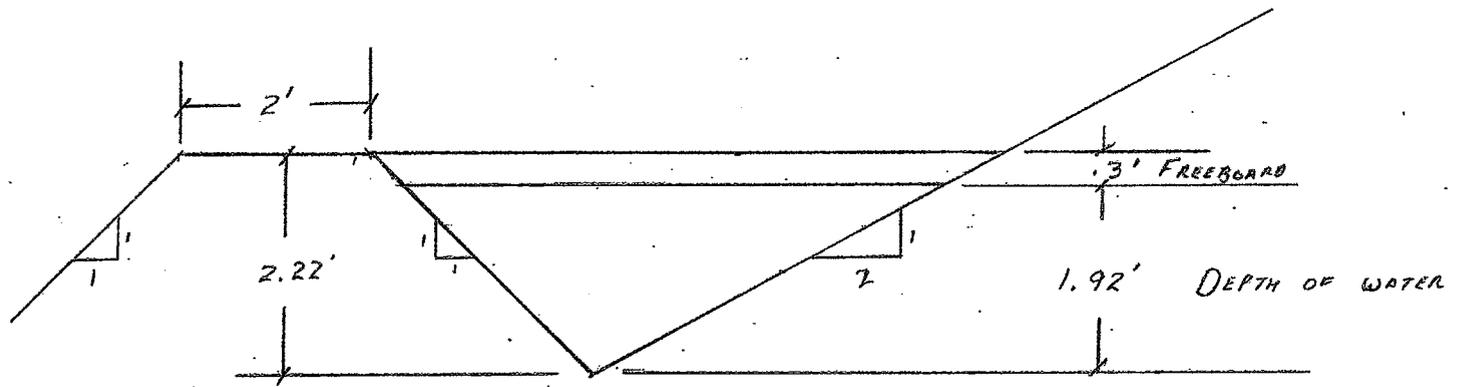
Company Name: CANYON FUEL CO., SKYLINE MINE  
Filename: C:\SEDCAD3\SPOIL User: Gary E. Taylor  
Date: 06-15-1998 Time: 15:41:04  
Runoff from Mine Waste Rock Pile  
Storm: 2.05 inches, 100 year- 6 hour, SCS Type II  
Hydrograph Convolution Interval: 1.0 hr

=====  
SUBWATERSHED/STRUCTURE INPUT/OUTPUT TABLE  
=====

-Hydrology-

JBS SWS	Area (ac)	CN	UHS	Tc (hrs)	K (hrs)	X	Base- Flow (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)	
111 1	0.33	85	M	0.030	0.000	0.000	0.0	0.02	0.44	
				Type: Null	Label: spoil					
111 Structure	0.33								0.02	
111 Total IN/OUT	0.33								0.02	0.44

TYPICAL CROSS-SECTION  
OF CONTAINMENT AREA



22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS







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

1594 West North Temple, Suite 1210  
PO Box 145801  
Salt Lake City, Utah 84114-5801  
801-538-5340  
801-359-3940 (Fax)  
801-538-7223 (TDD)

Michael O. Leavitt  
Governor

Lowell P. Braxton  
Division Director

August 25, 1998

Chris D. Hansen, Environmental Coordinator  
Canyon Fuel Company, LLC  
Skyline Mines  
P.O. Box 719  
Helper, Utah 84526

Re: Temporary Waste Rock Disposal Site, Canyon Fuel Company, LLC, Dugout Canyon Mine, ACT/007/039-98C, File #2, Carbon County, Utah

Dear Mr. Hansen:

As per your request the referenced amendment is hereby withdrawn effective August 25, 1998. Please note that the information dated August 21, 1998 is adequate to approve your proposal should you decide to pursue this option in the future.

If you have any questions, please call.

Sincerely,

A handwritten signature in cursive script that reads "Joseph C. Helfrich".

Joseph C. Helfrich  
Permit Supervisor

tam

Enclosure

cc: Ken Payne, Scofield  
Chris Hansen, Scofield  
Price Field Office

O:\007039.DUG\FINAL\WDRAWL.98C



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

1594 West North Temple, Suite 1210  
PO Box 145801  
Salt Lake City, Utah 84114-5801  
801-538-5340  
801-359-3940 (Fax)  
801-538-7223 (TDD)

Michael O. Leavitt  
Governor  
Lowell P. Braxton  
Division Director

August 20, 1998

TO: File

THRU: Daron Haddock, Permit Supervisor 

THRU: Joe Helfrich, Permit Supervisor 

FROM: Wayne H. Western, Senior Reclamation Specialist *WHW*

RE: New Temporary Waste Rock Site, Canyon Fuel Company, LLC, Dugout Canyon Mine, ACT/007/039-98C, File #2, Carbon County, Utah

**SUMMARY:**

On August 7, 1998, the Division received amendment 98C for the Dugout Canyon Mine. The Applicant's proposes changes to the temporary and permanent waste rock storage sites. The Division found the amendment inadequate to meet the minimum regulatory requirements.

**TECHNICAL ANALYSIS:**

**OPERATION PLAN**

**General**

Regulatory Reference: R645-301-521

The Applicant wants to amend the waste rock disposal plan. The proposed changes are:

- Ship underground development waste from the Dugout Canyon Mine to unnamed waste-rock disposal facilities provided the unnamed facilities are permitted to receive waste rock from the Dugout Canyon mine.
- Delete plans in the approved MRP to use waste rock as fill.
- Increase how much material that can be stored at the temporary waste rock storage site and the holding time.

The R645 regulations do not list specific requirements for shipping waste rock to an offsite disposal facilities. R645-301-521 states that the applicant will have a plan with a narrative stating how the relevant requirements are met. The plan must describe how waste rock will be disposed. The Division requires all permittees that ship waste rock offsite to name the receiving site. That information is needed to track the waste rock from cradle to grave. The Division finds the Applicant's commitment to ship waste rock to unnamed sites is inadequate to meet the requirements of R645-301-521.

The Division approved the use of waste rock as fill material provided all regulations concerning waste rock disposal are met. In the August 7, 1998 amendment the Applicant proposed amending the MRP so that all references to the use of waste rock as fill material are removed. That action would prohibit the Applicant from using waste rock as fill unless the Division later granted approval. The Division approves the Applicant request to remove the use of waste rock for fill material from the MRP.

The Applicant wants to change the procedures for temporarily storing waste rock on the site. The Applicant wants to allow waste rock to be stored on site for 4 months or until approximately 1,500 cubic yards of material is on the surface whichever comes first. The approved plan allowed the Applicant to store waste rock for 3 months or until one truck load is accumulated whichever comes first.

The Division will approve the Applicant to store waste rock for unto 4 months or until 1,500 cubic yards of material is on the surface whichever comes first. The Division has concern of the word approximate when used to describe the maximum amount of waste rock that can be stored on the site. To avoid confusion the Applicant must remove the word approximate from the description of the maximum amount of waste rock that can be stored on the site. See R645-301-121.200.

On the page number 5-41 of the August 7, 1998 submittal, the Applicant added the words "or use" to the first sentence of the last paragraph. In a phone conversation the Applicant told the Division that the words "or use" were added by error and would be removed. The Applicant must remove the words "or use" from the page number 5-41.

**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

**R645-301-521**, the Applicant must list the offsite locations where waste rock from the Dugout Canyon mine will be sent.

New Temporary Waste Rock Site  
ACT/007/039-98C  
August 24, 1998  
Page 3

## **Coal Mine Waste**

### **Disposal of Coal Mine Waste in Special Areas**

#### **Underground Disposal**

Regulation Reference R645-301-536.520

The Applicant proposes to remove the plan to dispose of waste rock underground. For Phase I the Division granted the Applicant permission to dispose of waste rock underground subject to MSHA approval. The Division approves the Applicant's request to remove underground disposal from the MRP.

#### **Findings:**

The Applicant has met the minimum requirements of this section.



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

1594 West North Temple, Suite 1210  
PO Box 145801  
Salt Lake City, Utah 84114-5801  
801-538-5340  
801-359-3940 (Fax)  
801-538-7223 (TDD)

Michael O. Leavitt  
Governor  
Lowell P. Braxton  
Division Director

August 17, 1998

TO: Folder #2

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Priscilla Burton, Reclamation Specialist *PB*

RE: Technical Analysis of Waste Rock Amendment, Canyon Fuels Company, Dugout Canyon Mine, ACT/007/039-98-C, Folder # 2, Carbon County, Utah

**SUMMARY**

The Dugout Canyon MRP identifies two locations for disposal of waste rock from the Dugout Mine. Those locations are the SUFCO mine and the Skyline Mine waste rock disposal sites. This amendment (received August 7, 1998) proposes to include any permitted waste rock disposal site as a potential location for waste rock disposal from the Dugout Canyon mine. Several questions concerning the chemical nature of the waste rock remain unanswered.

**TECHNICAL ANALYSIS**

**OPERATION PLAN**

**ACID OR TOXIC FORMING MATERIALS**

Regulatory Reference: R645-301-731.300

**Analysis:**

Information on the waste rock storage area to be utilized during site construction is included in Appendix 5-7. Space has been allocated for approximately 1500 CY of rock development waste on the surface as shown on Plate 5-2A. This material will be removed from the Dugout Mine site every 4 months or when 1500 CY accumulates, whichever comes

Page 2  
ACT/007/039-98-C  
August 17, 1998

first. Waste rock will then be removed to a DOGM permitted disposal site for final disposal. Quarterly inspections of the temporary waste rock storage area at Dugout Mine will be made by a professional engineer.

Roof and Floor analytical results are found in App 5-7 for the Gilson seam and the Rock Canyon seam. These samples were taken August 24, 1995. This sample of waste rock indicates that the material is not acidic or toxic given the parameters evaluated. However, an ongoing program of sampling the waste rock must be included in the MRP to allow the Division to evaluate the changing nature of the waste rock to ensure:

- (1) protection of the surface and groundwater at the temporary storage site, and
- (2) impacts on other potential temporary or final storage sites.

**Findings:**

Approval of this amendment is not recommended at this time.

**R645-301-731.300** Sampling and analysis of the material according to Table 6 of the Topsoil and Overburden guidelines is recommended for evaluation of its acid and toxic-forming potential. An on-going plan for testing the material as it is brought to the surface would ensure proper handling and disposal. This submittal does not provide enough information for the purposes of this regulation.



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

1594 West North Temple, Suite 1210  
PO Box 145801  
Salt Lake City, Utah 84114-5801  
801-538-5340  
801-359-3940 (Fax)  
801-538-7223 (TDD)

Michael O. Leavitt  
Governor  
Lowell P. Braxton  
Division Director

August 25, 1998

Rick Olsen, General Manager  
Canyon Fuel Company, LLC  
P.O. Box 1029  
Wellington, Utah 84542

Re: Alternative Waste Rock Storage Location, Canyon Fuel Company, LLC, Dugout Canyon Mine, ACT/007/039-98C, File #2, Carbon County, Utah

Dear Mr. Olsen:

The technical analysis of your proposal has been completed by Priscilla Burton and Wayne Western, (Senior Reclamation Specialists for the Division). Their analyses are provided for your review and comment. Please provide a response by September 3, 1998 or earlier.

**TECHNICAL ANALYSIS**

**OPERATION PLAN**

**ACID OR TOXIC FORMING MATERIALS**

Regulatory Reference: R645-301-731.300

**Analysis:**

Information on the waste rock storage area to be utilized during site construction is included in Appendix 5-7. Space has been allocated for approximately 1500 CY of rock development waste on the surface as shown on Plate 5-2A. This material will be removed from the Dugout Mine site every 4 months or when 1500 CY accumulates, whichever comes first. Waste rock will then be removed to a DOGM permitted disposal site for final disposal. Quarterly inspections of the temporary waste rock storage area at Dugout Mine will be made by a professional engineer.

Roof and Floor analytical results are found in App 5-7 for the Gilson seam and the Rock Canyon seam. These samples were taken August 24, 1995. This sample of waste rock indicates that the material is not acidic or toxic given the parameters evaluated. However, an ongoing program of sampling the waste rock must be included in the MRP to allow the Division to

evaluate the changing nature of the waste rock to ensure:

- (1) protection of the surface and groundwater at the temporary storage site, and
- (2) impacts on other potential temporary or final storage sites.

**Findings:**

Approval of this amendment is not recommended at this time.

**R645-301-731.300** Sampling and analysis of the material according to Table 6 of the Topsoil and Overburden guidelines is recommended for evaluation of its acid and toxic-forming potential. An on-going plan for testing the material as it is brought to the surface would ensure proper handling and disposal. This submittal does not provide enough information for the purposes of this regulation.

**TECHNICAL ANALYSIS:**

## **OPERATION PLAN**

### **General**

Regulatory Reference: R645-301-521

The Applicant wants to amend the waste rock disposal plan. The proposed changes are:

- Ship underground development waste from the Dugout Canyon Mine to unnamed waste-rock disposal facilities provided the unnamed facilities are permitted to receive waste rock from the Dugout Canyon mine.
- Delete plans in the approved MRP to use waste rock as fill.
- Increase how much material that can be stored at the temporary waste rock storage site and the holding time.

The R645 regulations do not list specific requirements for shipping waste rock to an offsite disposal facilities. R645-301-521 states that the applicant will have a plan with a narrative stating how the relevant requirements are met. The plan must describe how waste rock will be disposed. The Division requires all permittees that ship waste rock offsite to name the receiving site. That information is needed to track the waste rock from cradle to grave. The Division finds the Applicant's commitment to ship waste rock to unnamed sites is inadequate to meet the requirements of R645-301-521.

The Division approved the use of waste rock as fill material provided all regulations concerning waste rock disposal are met. In the August 7, 1998 amendment the Applicant

proposed amending the MRP so that all references to the use of waste rock as fill material are removed. That action would prohibit the Applicant from using waste rock as fill unless the Division later granted approval. The Division approves the Applicant request to remove the use of waste rock for fill material from the MRP.

The Applicant wants to change the procedures for temporarily storing waste rock on the site. The Applicant wants to allow waste rock to be stored on site for 4 months or until approximately 1,500 cubic yards of material is on the surface whichever comes first. The approved plan allowed the Applicant to store waste rock for 3 months or until one truck load is accumulated whichever comes first.

The Division will approve the Applicant to store waste rock for unto 4 months or until 1,500 cubic yards of material is on the surface whichever comes first. The Division has concern of the word approximate when used to describe the maximum amount of waste rock that can be stored on the site. To avoid confusion the Applicant must remove the word approximate from the description of the maximum amount of waste rock that can be stored on the site. See R645-301-121.200.

On the page number 5-41 of the August 7, 1998 submittal, the Applicant added the words "or use" to the first sentence of the last paragraph. In a phone conversation the Applicant told the Division that the words "or use" were added by error and would be removed. The Applicant must remove the words "or use" from the page number 5-41.

### **Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the Applicant must provide the following in accordance with:

**R645-301-521**, the Applicant must list the offsite locations where waste rock from the Dugout Canyon mine will be sent.

### **Coal Mine Waste**

#### **Disposal of Coal Mine Waste in Special Areas**

#### **Underground Disposal**

Regulation Reference R645-301-536.520

The Applicant proposes to remove the plan to dispose of waste rock underground. For Phase I the Division granted the Applicant permission to dispose of waste rock underground subject to MSHA approval. The Division approves the Applicant's request to remove

Temporary Waste Rock Storage  
ACT/007/039-98C  
August 25, 1998  
Page 4

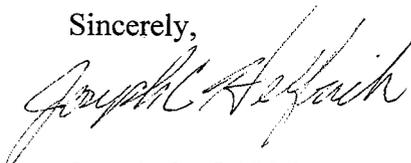
underground disposal from the MRP.

**Findings:**

The Applicant has met the minimum requirements of this section.

If you have any questions, please call.

Sincerely,



Joseph C. Helfrich  
Permit Supervisor

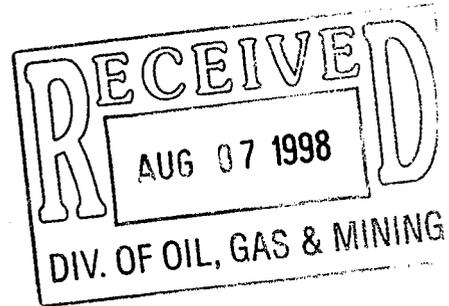
tam

cc: Ken Payne, Scofield  
Chris Hansen, Scofield  
Price Field Office  
O:\007039.DUG\FINAL\DEF.98C



Canyon Fuel Company, LLC  
Skyline Mines  
P.O. Box 719  
Helper, Utah 84526  
435/448-6463 Fax: 435/448-2632

007/039 #2  
cc: Joe, Steve, Mike



August 7, 1998

Coal Regulatory Program  
Attn: Joe Helfrich  
Utah Division of Oil, Gas and Mining  
1594 West North Temple, Suite 1210  
P.O. Box 145801  
Salt Lake City, Utah 84114

RE: Response to Division's TA Regarding the New Temporary Waste Rock Storage Area,  
Dugout Canyon Mine M&RP, ACT/007/039

Dear Joe:

Please find enclosed five (5) copies of modified text for the Dugout Canyon M&RP. After reviewing the Division's TA, Canyon Fuel Company, LLC (CFC) determined that at this time the waste rock generated at the Dugout Canyon Mine would not be used a fill material but would be disposed of at an approved waste rock disposal area. Therefore, references to using the waste rock as fill have been removed from the permit. Furthermore, CFC intends to pursue disposing of waste rock at permitted disposal sites in addition to the Skyline and SUFCo locations.

Enclosed with this submittal are: a copy of the permit text modifications illustrated with redline-strike through, five copies of unmarked text, Appendices 5-7 and 7-12 with certified calculations, and the completed C1 and C2 forms. If you have any questions regarding this submittal, please call me at (435) 448-2669.

Sincerely,

Chris D. Hansen  
Environmental Coordinator  
Canyon Fuel Company, LLC

enclosures

Form DOGM - C1 (Last Revised August 6, 1998)

# APPLICATION FOR PERMIT PROCESSING

Permit Change <input checked="" type="checkbox"/>	New Permit <input type="checkbox"/>	Renewal <input type="checkbox"/>	Transfer <input type="checkbox"/>	Exploration <input type="checkbox"/>	Bond Release <input type="checkbox"/>	Permit Number: ACT/007/039
Title of Proposal: Modification to the Temporary Waste Rock Storage Area Location Amendment.						Mine: Dugout Canyon
						Permittee: CANYON FUEL CO., LLC

Description, include reason for application and timing required to implement:

Text modifications and additions to the appendices of Chapter 5 and 7 for the new temporary waste rock storage area.

**Instructions:** If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation specialist.

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 1. Change in the size of the Permit Area? _____ acres. Disturbed Area? _____ acres <input type="checkbox"/> increase <input type="checkbox"/> decrease |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 2. Is the application submitted as a result of a Division Order? DO # _____  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 4. Does application include operations in hydrologic basins other than as currently approved?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 6. Does the application require or include public notice/publication?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 7. Does the application require or include ownership, control, right-of-entry, or compliance information?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 9. Is the application submitted as a result of a Violation? NOV # _____  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 10. Is the application submitted as a result of other laws or regulations or policies? Explain: _____  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 11. Does the application affect the surface landowner or change the post mining land use?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2?)                                    |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 13. Does the application require or include collection and reporting of any baseline information?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 15. Does application require or include soil removal, storage or placement?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 16. Does the application require or include vegetation monitoring, removal or revegetation activities?   |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 17. Does the application require or include construction, modification, or removal of surface facilities?  |
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | 18. Does the application require or include water monitoring, sediment or drainage control measures?   |
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | 19. Does the application require or include certified designs, maps, or calculations?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 20. Does the application require or include subsidence control or monitoring?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 21. Have reclamation costs for bonding been provided for?  |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?   |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | 23. Does the application affect permits issued by other agencies or permits issued to other entities?  |

Attach 5 complete copies of the application.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein. (R645-301-123)

Glenna Bullard Notary Public 8/6/98  
Signed - Name - Position - Date

Subscribed and sworn to before me this 6 day of Aug, 19 98.

Glenna Bullard  
Notary Public  
9-15, 19 2001  
My Commission Expires: 9-15, 19 2001  
STATE OF UTAH  
COUNTY OF CANON

GLENNA BULLARD  
NOTARY PUBLIC • STATE OF UTAH  
760 NORTH 300 EAST  
PRICE, UTAH 84601  
COMM. EXP. 9-15-2001

Received by Oil, Gas & Mining

**RECEIVED**

AUG 07 1998

DIV. OF OIL, GAS & MINING  
ASSIGNED TRACKING NUMBER

