

**APPENDIX 5-6**

**Reclamation Bond Estimate**

1. SEC 220.

Confidential

Shelf

Expandable

Refer to Record No. 0056 Date 08282003

In CD 70039, 2003 Following

For additional information

0056



Canyon Fuel Company LLC  
Soldier/Dugout Canyon Mine  
P.O. Box 1029  
Wellington, Utah 84542  
(435)837-6360 Fax: (435)636-2897

**COPY**

INCOMING  
0070039

OK

August 28, 2003

Ms. Pamela Grubaugh-Littig  
Department of Natural Resources  
Division of Oil, Gas and Mining  
1594 West North Temple  
Suite 1210  
Salt Lake City, UT 84114-5801

RE: Revisions to Methane Degassification Amendment, Wells G-1, G-2, and G-3,  
Canyon Fuel Company, LLC, Dugout Mine, C/007/039

Dear Ms. Grubaugh-Littig:

Enclosed please find four copies of the submittal to address revisions to the methane degassification wells amendment for Dugout Canyon Mine. The information provided in the degassification amendment is to be kept in a separate binder and not incorporated into the M&RP binders. However, Appendix 5-6, Reclamation Bond of the M&RP is part of this amendment and has received revisions and will need to be incorporated into the M&RP binders once this amendment has been approved. Wayne Western has reviewed the bond and we are submitting it for incorporation in the M&RP.

The information provided addressed concerns of the reviewers. The productivity letter from the NRCS has not yet been received. The notification letter to the land owner will be written once the amendment has been approved, a copy of the letter will be incorporated into the amendment at a later date. Attached is a explanation associated with several concerns, which should answer questions which may arise and explain why concerns have been addressed a certain way.

An additional copy of the submittal has been delivered to the Price Field Office.

Please contact Vicky Miller at (435) 636-2869, if there are any questions concerning this submittal.

Sincerely yours,

Vicky S. Miller

Cc: Chris Hansen (no enclosures)  
Dave Spillman (enclosures)  
Pete Hess (enclosures)

FILE IN:  
0070039.2003. Incoming  
Refer to:  
 Confidential  
 Shelf  
 Expandable  
Date 8/28/03 for additional information

RECEIVED

AUG 29 2003

DIV. OF OIL, GAS & MINING

**APPLICATION FOR COAL PERMIT PROCESSING**

**COPY**

Permit Change  New Permit  Renewal  Exploration  Bond Release  Transfer

**Permittee:** Canyon Fuel Company, LLC

**Mine:** Dugout Canyon Mine

**Permit Number:** C/007/039

**Title:** Revisions to Degassification Wells G-1, G-2, & G-3 Amendment

**Description,** Include reason for application and timing required to implement:

**Instructions:** If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

- Yes  No 1. Change in the size of the Permit Area? Acres: \_\_\_\_\_ Disturbed Area: 2.78  increase  decrease.
- Yes  No 2. Is the application submitted as a result of a Division Order? DO# \_\_\_\_\_
- Yes  No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- Yes  No 4. Does the application include operations in hydrologic basins other than as currently approved?
- Yes  No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- Yes  No 6. Does the application require or include public notice publication?
- Yes  No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- Yes  No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- Yes  No 9. Is the application submitted as a result of a Violation? NOV # \_\_\_\_\_
- Yes  No 10. Is the application submitted as a result of other laws or regulations or policies?  
*Explain:* \_\_\_\_\_
- Yes  No 11. Does the application affect the surface landowner or change the post mining land use?
- Yes  No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- Yes  No 13. Does the application require or include collection and reporting of any baseline information?
- Yes  No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- Yes  No 15. Does the application require or include soil removal, storage or placement?
- Yes  No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- Yes  No 17. Does the application require or include construction, modification, or removal of surface facilities?
- Yes  No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- Yes  No 19. Does the application require or include certified designs, maps or calculation?
- Yes  No 20. Does the application require or include subsidence control or monitoring?
- Yes  No 21. Have reclamation costs for bonding been provided?
- Yes  No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- Yes  No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

**Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you.** (These numbers include a copy for the Price Field Office)

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.

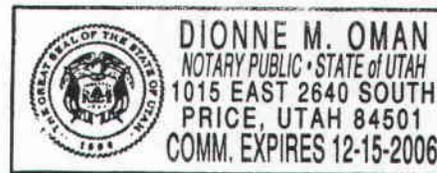
David Spillman  
Print Name

David Spillman, Engineering Manager  
Sign Name, Position, Date  
8/29/03

Subscribed and sworn to before me this 28 day of August, 2003

Dionne M. Oman  
Notary Public

My commission Expires: 12-15, 2006  
Attest: State of Utah ) ss:  
County of Carbon



<p><b>For Office Use Only:</b></p>	<p><b>Assigned Tracking Number:</b></p>	<p><b>Received by Oil, Gas &amp; Mining</b></p> <p align="center"><b>RECEIVED</b></p> <p align="center"><b>AUG 29 2003</b></p> <p align="center">DIV. OF OIL, GAS &amp; MINING</p>
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## Bonding Calculations

## Direct Costs

Subtotal Demolition and Removal	\$686,940.00
Subtotal Backfilling and Grading	\$522,635.00
Subtotal Revegetation	\$277,997.00
Direct Costs	\$1,487,572.00

## Indirect Costs

Mob/Demob	\$148,757.00	10.0%
Contingency	\$74,379.00	5.0%
Engineering Redesign	\$37,189.00	2.5%
Main Office Expense	\$101,155.00	6.8%
Project Management Fee	\$37,189.00	2.5%
Subtotal Indirect Costs	\$398,669.00	26.8%

Total Cost	\$1,886,241.00
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Escalation factor	0.0289
Number of years	2
Escalation	\$110,600.00

Reclamation Cost Escalated	\$1,996,841.00
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Bond Amount (rounded to nearest \$1,000) 2005 Dollars	\$1,997,000.00
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Mine Belt BC-1 No 1																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						62800					CF		62800	CF	15700
	Structure's Vol. Demolished																0.35	814	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity											52				TON		52	TON	
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day															
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trfv	\$39.15	HR															
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						20									
	Concrete's Vol. Demolished																			
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY															
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. tri	02320 200 0320	3.09	/CY															
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY															
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Transfer Building No 2																				
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						104818					CF		104818	CF	28155	
	Structure's Vol. Demolished																0.35	1356	CY		
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity											50				TON		50	TON		
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day																
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trmv	\$39.15	/HR										3.1	DAY		3.1	DAY	1265	
	Disposal Cost Steel														25	HR		25	HR	979	
	Subtotal																				
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						229										
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY																
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. In	02320 200 0320	3.06	/CY																
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY																
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Feed Belt BC 2 No3										47436					CF		47436	CF	11890
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF												0.35	618	CY	
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel															TON			30	TON
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										1.9	DAY			1.9	DAY
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trfv	\$39.15	HR										15	HR			15	HR
	Disposal Cost Steel																			1222
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Demolition Costs

Dugout Canyon C/007/039

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Stack Tubes 2 No4																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal											158					CY	1.3		158 CY	1580
	Concrete Demolition	Concrete demolition	ConcreteDemo1	10.08	/CY															205 CY	207
	Demolition Cost																			205 CY	633
	Concrete's Vol. Demolished	Front end loader 3 CY	02315 400 1300	1.3	/CY															205 CY	1292
	Loading Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. tri	02320 200 0320	3.09	/CY															205 CY	3781
	Transportation Cost	On site disposal	02220 875 5550	6.3	/CY																
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Head House 1 No 5																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	CF						23878					CF		23878	CF	5970
	Structure's Vol. Demolished																0.35	310	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity											10				TON		10	TON	
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										0.8	DAY		0.8	DAY	245
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trty	\$39.15	HR										5	HR		5	HR	198
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Transfer Belt BC 2 No 6																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						30000					CF		30000	CF	7500
	Structure's Vol. Demolished																0.35	389	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity											20				TON		20	TON	
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day															
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhv	\$39.15	HR									1.3		DAY		1.3	DAY	630
	Disposal Cost Steel													10		HR		10	HR	392
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Head House 2 No 7																			
	Structure's Demolition Cost	Steel Bld., Large	02220 100 0012	0.25	/CF						4436					CF		4436	CF	1109
	Structure's Vol. Demolished																	0.35	58	CY
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight															TON		10	TON	
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										0.8	DAY		0.8	DAY	245
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhw	\$39.15	HR										5	HR		5	HR	196
	Disposal Cost Steel																			
	Subtotal																			150
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Reclaim Tunnel No 8																				
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						18774					CF		18774	CF	4894	
	Structure's Vol. Demolished																0.35	243	CY		
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight											32				TON		32	TON		
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										2	DAY		2	DAY	816	
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhr	\$39.15	HR										16	HR		16	HR	628	
	Disposal Cost Steel																				
	Subtotal																			6134	
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						1182					CY		1182	CY	11891	
	Concrete's Vol. Demolished																1.3	1537	CY		
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY															1998	
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tri	02320 200 0320	3.09	/CY															4749	
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY															9683	
	Subtotal																			23271	
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				

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8/29/2003

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Reclaim Belt BC 4 No 9																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						35180					CF		35180	CF	8795
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																	0.35	456	CY
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity											40				TON			40	TON
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day															
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trfv	\$39.15	HR									2.5		DAY		2.5	DAY	1020
	Disposal Cost Steel													20		HR		20	HR	783
	Subtotal																			
	Equipment's Disposal Cost																			0540
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						39					CY		39	CY	392
	Concrete's Vol. Demolished																			
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY													1.3	51	CY
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 ml. md. tri	02320 200 0320	3.09	/CY														51	CY
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY														51	CY
	Subtotal																			321
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			1533

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Escape Tunnel 60 inch No 10																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						2827					CF		2827	CF	707
	Structure's Vol. Demolished																	0.35	37	CY
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity											4				TON		4	TON	
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01560 200 5300	408.01	/day															
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trfv	\$39.15	HR									0.3		DAY		0.3	DAY	122
	Disposal Cost Steel													2		HR		2	HR	78
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Crusher Building No 11																			
	Structure's Demolition Cost	Steel Bid, Large	02220 100 0012	0.25	/CF						93305					CF		93305	CF	23326
	Structure's Vol. Demolished																	0.35	1210	CY
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight											100				TON			100	TON
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										6.3	DAY		6.3	DAY	2570
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trfv	\$39.15	HR										50	HR		50	HR	1958
	Disposal Cost Steel																			
	Subtotal																			7234
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						91					CY		91	CY	915
	Concrete's Vol. Demolished																			
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY													1.3	118	CY
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tri	02320 200 0320	3.99	/CY														118	CY
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY														118	CY
	Subtotal																		118	CY
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			0000

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Truck Loadout Belt BC 5 No 12																				
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						30899					CF		30899	CF	7725	
	Structure's Vol. Demolished																	0.35	401	CY	
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity											20				TON				20	TON
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day																
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhw	\$39.15	/HR										1.3	DAY				1.3	DAY
	Disposal Cost Steel														10	HR				10	HR
	Subtotal																				392
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						39										
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY																
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. trl	02320 200 0320	3.09	/CY																
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY																
	Subtotal																				321
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				6504

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Truck Loadout and Scale No 13																				
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						74976					CF		74976	CF	18744	
	Structure's Vol. Demolished																	0.35	972	CY	
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity											50				TON		50	TON		
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day																
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Triv	\$39.15	HR									3.1		DAY		3.1	DAY	1265	
	Disposal Cost Steel													25		HR		25	HR	979	
	Subtotal																			2048	
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						159										
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY													1.3	159	CY	1800
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 ml. rd. tri	02320 200 0320	3.09	/CY														207	CY	269
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY														207	CY	640
	Subtotal																			207	1304
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Bathhouse No 14																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						416366					CF	0.2	416366	CF	104091
	Structure's Vol. Demolished																	3084	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																	3084	CY	12336
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY							107								
	Steel's Weight																			
	Truck's Capacity																			
	Haulage														6.7	DAY		6.7	DAY	2734
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										54	HR		54	HR	2114
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Triv	\$39.15	/HR															
	Disposal Cost Steel																			
	Subtotal																			21273
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						294					CY	1.3	294	CY	2958
	Concrete's Vol. Demolished																	382	CY	497
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY													382	CY	1180
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. tri	02320 200 0320	3.09	/CY													382	CY	2407
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY															
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost		
	Substation No 15																					
	Structure's Demolition Cost	Mixed Materials Bld. Large	02220 100 0100	0.26	/CF						4000					CF		4000	CF	1040		
	Structure's Vol. Demolished																					
	Rubble's Weight (exclude steel)																					
	Truck's Capacity																	0.35	52	CY		
	Haulage																					
	Transportation Cost Non Steel Truck																					
	Transportation Cost Non Steel Drive																					
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY																	
	Steel's Weight																					
	Truck's Capacity																			52	CY	208
	Haulage																					
	Transportation Cost Steel Truck																					
	Transportation Cost Steel Truck Drive																					
	Disposal Cost Steel																					
	Subtotal																					
	Equipment's Disposal Cost																					1243
	Dismantling Cost																					
	Equipment's Vol. Demolished																					
	Loading Costs																					
	Transport Costs																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY																	
	Concrete's Vol. Demolished																					
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY						24					CY		24	CY	241		
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tri	02320 200 0320	3.09	/CY													1.3	31	CY	40	
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY															31	CY	98
	Subtotal																					172
	Concrete Demolition																					
	Demolition Cost																					
	Concrete's Vol. Demolished																					
	Loading Cost																					
	Transportation Cost																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Demolition Cost																					
	Concrete's Vol. Demolished																					
	Loading Cost																					
	Transportation Cost																					
	Disposal Costs																					
	Subtotal																					
	Total																					1520

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Power Lines and Poles No 16																				
	Structure's Demolition Cost	Dugout Powerline	Dugout 1	0.23	/FT	1937										FT		1937	FT	446	
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				446
	Power Poles																				
	Equipment's Disposal Cost	Dugout Power Poles	Dugout 2	126	/EA											EA		12	EA	1512	
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				1512
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				958

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Retaining Wall No 17																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06 /CY							30					CY		30	CY	302
	Concrete's Vol. Demolished																1.3	39	CY	51
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3 /CY														39	CY	121
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. trl	02320 200 0320	3.09 /CY														39	CY	246
	Disposal Costs	On site disposal	02220 875 5550	6.3 /CY																20
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Gabion Wall No 18																			
	Structures Volume										880					CY				
	Demolition Time 80 CY/DAY														117	HR				
	Structure's Demolition Cost	Crew B 13	MeansCrewB13	379.51	/HR													117	HR	44403
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)													2		TON/CY		1780	TON	
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day									14.8		DAY		14.8	DAY	5957
	Transportation Cost Non Steel Drive	Truck Driver, Heavy	Trhv	\$39.15	HR									117		HR		117	HR	4581
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			4941
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			54041

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Pump House No 19																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						2219					CF		2219	CF	555
	Structure's Vol. Demolished																			
	Rubble's Weight (exclde steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel											5				TON		5	TON	
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										0.3	DAY		0.3	DAY	122
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trty	\$39.15	HR										2	HR		2	HR	78
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.08	/CY						82					CY		82	CY	826
	Concrete's Vol. Demolished																	1.3	107	CY
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY														107	CY
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tri	02320 200 0320	3.09	/CY														107	CY
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY														107	CY
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			1724

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Paved Road No 20																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	<b>Subtotal</b>																				
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Asphalt Demolition																				
	Demolition Cost	Pavement Removal 4-6"	02220 875 1750	6.4 /SY						8448						SY		8448	SY	54067	
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs	On site disposal	02220 875 5550	7.2 /CY							156					CY		156	CY	1123	
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	<b>Total</b>																				55190

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Stream Culvert 72 Inch No 21																			
	Excavate Culvert	Excavation Bulk Bank 2 CY (322BL)	02315 400 0260	1.73	/CY	2350	12	12								CF		12533	CY	21682
	Backfill Culvert	Backfill Trench Minimal Haul 2 1/4 CY	02315 900 3080	1.48	/CY	2350	12	12								CF		12533	CY	18549
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										5.9	DAY		5.9	DAY	2407
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhw	\$39.15	HR										47	HR		47	HR	1840
	Disposal Cost Steel																			
	Subtotal																			44478
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Water Tanks No 22																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						241									
	Rubble's Vol. Demolished																	241	CF	60
	Rubble's Weight (exclude steel)																0.35	3	CY	
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity											39				TON			39	TON
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day															
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhv	\$39.15	/HR									2.4		DAY			2.4	DAY
	Disposal Cost Steel													19		HR			19	HR
	Subtotal																			1743
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						50									
	Concrete's Vol. Demolished																			
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY														50	CY
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mil. md. tm	02320 200 0320	3.09	/CY														85	CY
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY														85	CY
	Subtotal																			201
	Concrete Demolition																			410
	Demolition Cost																			503
	Concrete's Vol. Demolished																			85
	Loading Cost																			85
	Transportation Cost																			85
	Disposal Costs																			85
	Subtotal																			410
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost		
	Rock Dust Bin No 23																					
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.26	/CF						2265					CF		2265	CF	586		
	Structure's Vol. Demolished																					
	Rubble's Weight (exclude steel)																0.35		29	CY		
	Truck's Capacity																					
	Haulage																					
	Transportation Cost Non Steel Truck																					
	Transportation Cost Non Steel Drive																					
	Disposal Cost Non Steel																					
	Steel's Weight											5				TON				5	TON	
	Truck's Capacity																					
	Haulage																					
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										0.3	DAY			0.3	DAY	122	
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhw	\$39.15	HR										2	HR			2	HR	78	
	Disposal Cost Steel																					
	Subtotal																				104	
	Equipment 's Disposal Cost																					
	Dismantling Cost																					
	Equipment 's Vol. Demolished																					
	Loading Costs																					
	Transport Costs																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						12					CY			12	CY	121	
	Concrete's Vol. Demolished																					
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY															16	CY	21
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tri	02320 200 0320	3.09	/CY															16	CY	49
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY															16	CY	101
	Subtotal																				202	
	Concrete Demolition																					
	Demolition Cost																					
	Concrete's Vol. Demolished																					
	Loading Cost																					
	Transportation Cost																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Demolition Cost																					
	Concrete's Vol. Demolished																					
	Loading Cost																					
	Transportation Cost																					
	Disposal Costs																					
	Subtotal																					
	Total																				1053	

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Fuel Tank and Fuel Station No 24																				
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						3945					CF	0.35	3945	CF	988	
	Structure's Vol. Demolished																	51	CY		
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight											7				TON		7	TON		
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										0.4	DAY		0.4	DAY	163	
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trmv	\$39.15	/HR										3	HR		3	HR	117	
	Disposal Cost Steel																				
	Subtotal																			1226	
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						12					CY		12	CY	121	
	Concrete's Vol. Demolished																	1.3			
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY														18	CY	
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tri	02320 200 0320	3.09	/CY														18	CY	
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY														18	CY	
	Subtotal																			22	
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																			1650	

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Holding Tank No 25																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel	6000 gal. to 8000 gal. tank	02115 200 0310	229	Ea.							2				1 EA TON		1 EA 2 TON		229
	Steel's Weight																			
	Truck's Capacity																			
	Haulage														0.1	DAY		0.1 DAY		41
	Transportation Cost Steel Truck	Truck dump 18 ton payload	01590 200 5300	408.01	/day										1	HR		1 HR		39
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Triv	\$39.15	HR															300
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Ventilation Fan No 26																				
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						6850										
	Structure's Vol. Demolished																	6850	CF	1713	
	Rubble's Weight (exclude steel)																	0.35	89	CY	
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day																
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trfv	\$38.15	HR																
	Disposal Cost Steel																				
	Subtotal																				196
	Equipment's Disposal Cost																				2154
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				2154

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Magnet 27																				
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						35					CF		35	CF	9	
	Structure's Vol. Demolished																	0.35	0	CY	
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight											2				TON			2	TON	
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day											DAY		0.1	DAY	41	
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trthv	\$39.15	/HR											HR		1	HR	39	
	Disposal Cost Steel																				
	Subtotal																				
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.08	/CY						17					CY			17	CY	171
	Concrete's Vol. Demolished																	1.3	22	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.35	/CY														22	CY	30
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tri	02320 200 0320	3.23	/CY														22	CY	71
	Disposal Costs	On site disposal	02220 875 5550	7.2	/CY														22	CY	158
	Subtotal																				430
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				510

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Water System 28																			
	Excavate Pipe	Excavating 2-1/2 CY hydraulic backhoe	02315 900 0620	2.35	/CY	8450														
	Pipe Removal	Pipe removal 12 inch	02220 875 2900	7.05	/FT	8450		2	4							FT		2504	CY	5884
	Backfill Trench	Backfill Trench Minimal Haul 2 1/4 CY	02315 900 3080	1.48	/CY	8450		2	4							FT		6450	FT	59573
	Structure's Vol. Demolished															FT		2504	CY	3708
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			69163
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			69163

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Sewage System 29																			
	Excavate Pipe	Excavating 2-1/2 CY hydraulic backhoe	02315 900 0820	2.35	/CY	2832	2	4								FT		839	CY	1972
	Pipe Removal	Pipe removal 12 inch	02220 875 2900	7.05	/FT	2832										FT		2832	FT	19669
	Backfill Trench	Backfill Trench Minimal Haul 2 1/4 CY	02315 900 3080	1.48	/CY	2832	2	4								FT		839	CY	1242
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			23180
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			23180

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	AM01J Nov. 28, 2001																				
	Storage Containers 31																				
	Trailers NO 1																				
	Structure's Demolition Cost	Mixed Materials Bld. Large	02220 100 0100	0.26	/CF	40	10	10							8	FT	0.35	32000	CF	8320	
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel	ECDC	ECDC	35	/TON							24							24	TON	840
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				9160
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				9160

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Gilson Well No 32																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	KCF						800					CF		800	CF	200
	Structure's Vol. Demolished																	0.35	10	CY
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight											0.5				TON		0.5	TON	
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day															
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Ttrtv	\$39.15	HR											DAY		0.03	DAY	12
	Disposal Cost Steel															HR		0.2	HR	8
	Subtotal																			220
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						55									
	Concrete's Vol. Demolished																			
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY															
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tri	02320 200 0320	3.06	/CY															
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY															
	Subtotal																			1323
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			643

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Shop Building No 33																			
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						14400									
	Structure's Vol. Demolished																	14400	CF	
	Rubble's Weight (exclude steel)																0.35	187	CY	3900
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage												0.5							
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day															
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhv	\$39.15	/HR															
	Disposal Cost Steel													0.03					0.03	DAY
	Subtotal													0.2					0.2	HR
	Equipment's Disposal Cost																			3620
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY															
	Concrete's Vol. Demolished										55									
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY														55	CY
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. md. tm	02320 200 0320	3.09	/CY														72	CY
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY														72	CY
	Subtotal																		72	CY
	Concrete Demolition																			454
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Switch House No 34																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight											16				TON		16	TON		
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day										1	DAY		1	DAY	408	
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trmv	\$39.15	HR										8	HR		8	HR	313	
	Disposal Cost Steel																				
	<b>Subtotal</b>																			721	
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						11					CY		11	CY	111	
	Concrete's Vol. Demolished																1.3				
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY														14	CY	18
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. tri	02320 200 0320	3.09	/CY														14	CY	43
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY														14	CY	88
	<b>Subtotal</b>																			200	
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	<b>Total</b>																				

36

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Portals No 35																				
	Structure's Demolition Cost	Seal Portals	AML 1	5200	EA											5	EA		5	EA	26000
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	<b>Subtotal</b>																				26000
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	<b>Total</b>																				26000

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Storage Building No 36																				
	Structure's Demolition Cost	Steel Bld. Large	02220 100 0012	0.25	/CF						2284					CF		2284	CF	571	
	Structure's Vol. Demolished																0.35	30	CY		
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight											6				TON		6	TON		
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01	/day									0.4		DAY		0.4	DAY	163	
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trfw	\$39.15	/HR									3		HR		3	HR	117	
	Disposal Cost Steel																				
	<b>Subtotal</b>																			851	
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						38.4					CY		38.4	CY	388	
	Concrete's Vol. Demolished																1.3	50	CY		
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY													50	CY	65	
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. tri	02320 200 0320	3.09	/CY													50	CY	155	
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY													50	CY	315	
	<b>Subtotal</b>																			527	
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	<b>Total</b>																			1772	

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Sampling System No 37																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity											18				TON		18	TON		
	Haulage																				
	Transportation Cost Steel Truck	Truck dump 16 ton payload	01590 200 5300	408.01 /day											1.1	DAY		1.1	DAY	449	
	Transportation Cost Steel Truck Drive	Truck Driver, Heavy	Trhw	\$39.15 /HR											9	HR		9	HR	352	
	Disposal Cost Steel																				
	Subtotal																				801
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.08 /CY																	
	Concrete's Vol. Demolished										19.84					CY		19.84	CY	200	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3 /CY														1.3	26	CY	
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 ml. md. tri	02320 200 0320	3.09 /CY															26	CY	34
	Disposal Costs	On site disposal	02220 875 5550	6.3 /CY															26	CY	80
	Subtotal																			26	164
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Degas Well G1 No 38																				
	Grade and Backfill	Front end loader 3 CY	02315 400 1300	1.35	/CY						42					CY		42	CY	57	
	Fill in Mud Pit	Excavating 2-1/2 CY hydraulic backhoe	02315 900 0620	2.35	/CY						840					CY		840	CY	1974	
	Subtotal																			2031	
	Plug Well Casing	Concrete Ready Mix 8000 psi	03310 220 0412	160	/CY						21					CY		21	CY	3360	
	Subtotal																			3360	
	Spread Topsoil	Front end loader 3 CY	02315 400 1300	1.35	/CY						414					CY		414	CY	559	
	Spread Topsoil	Excavating 2-1/2 CY hydraulic backhoe	02315 900 0620	2.35	/CY						414					CY		414	CY	973	
	Subtotal																			1532	
	Fence																				
	Remove Barbed Wire	Fencing Barbed wire 3 strand	02220 875 0600	1.43	/LF	551										FT		551	FT	788	
	Subtotal																			788	
	Support																				
	Pickup Truck	Pickup Rental	01590 400 7200	68.1	/day									5.1		hr			0.6	day	41
	Foreman	Foreman Average, Outside	Foreman	\$53.65	HR									5.1		hr			5.1	hr	274
	Subtotal																			315	
	Total																			6020	

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Degas Well G2 No 39																			
	Grade and Backfill	Front end loader 3 CY	02315 400 1300	1.35	/CY						56					CY		56	CY	78
	Fill in Mud Pit	Excavating 2-1/2 CY hydraulic backhoe	02315 900 0620	2.35	/CY						1246					CY		1246	CY	2928
	Subtotal																			3006
	Plug Well Casing	Concrete Ready Mix 8000 psi	03310 220 0412	160	/CY						21					CY		21	CY	3360
	Subtotal																			3360
	Spread Topsoil	Front end loader 3 CY	02315 400 1300	1.35	/CY						3103					CY		3103	CY	4180
	Spread Topsoil	Excavating 2-1/2 CY hydraulic backhoe	02315 900 0620	2.35	/CY						3103					CY		3103	CY	7282
	Subtotal																			11461
	Fence																			
	Remove Barbed Wire	Fencing Barbed wire 3 strand	02220 875 0600	1.43	/LF	917										FT		917	FT	1311
	Subtotal																			1311
	Support																			
	Pickup Truck	Pickup Rental	01590 400 7200	66.1	/day										37.2	hr		4.7	day	320
	Foreman	Foreman Average, Outside	Foreman	\$53.65	HR										37.2	hr		37.2	hr	1998
	Subtotal																			2218
	Total																			17172

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Degas Well G3 No 40																				
	Grade and Backfill	Front end loader 3 CY	02315 400 1300	1.35	/CY						57					CY		57	CY	77	
	Fill in Mud Pit	Excavating 2-1/2 CY hydraulic backhoe	02315 900 0620	2.35	/CY						2543					CY		2543	CY	5976	
	Subtotal																			6053	
	Plug Well Casing	Concrete Ready Mix 8000 psi	03310 220 0412	160	/CY						21					CY		21	CY	3360	
	Subtotal																			3360	
	Spread Topsoil	Front end loader 3 CY	02315 400 1300	1.35	/CY						1182					CY		1182	CY	1598	
	Spread Topsoil	Excavating 2-1/2 CY hydraulic backhoe	02315 900 0620	2.35	/CY						1182					CY		1182	CY	2778	
	Subtotal																			4376	
	Fence																				
	Remove Barbed Wire	Fencing Barbed wire 3 strand	02220 875 0600	1.43	/LF	542										FT		542	FT	775	
	Subtotal																			775	
	Support																				
	Pickup Truck	Pickup Rental	01590 400 7200	88.1	/day										14.4	hr			1.8	day	123
	Foreman	Foreman Average, Outside	Foreman	\$53.65	/HR										14.4	hr			14.4	hr	773
	Subtotal																			896	
	Total																			15458	

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Stoker Storage Bin No 41																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolished																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment 's Disposal Cost																			
	Dismantling Cost																			
	Equipment 's Vol. Demolished																			
	Loading Costs																			
	Transport Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						35					CY		35	CY	352
	Concrete's Vol. Demolished																1.3	48	CY	
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY													48	CY	60
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. tr	02320 200 0320	3.08	/CY													48	CY	142
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY													48	CY	290
	Subtotal																			644
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			644

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Substation No 2 No 42																				
	Structure's Demolition Cost	Mixed Materials Bld. Large	02220 100 0100	0.28	/CF						4000					CF		4000	CF	1040	
	Structure's Vol. Demolished																	0.35	52	CY	
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel	City Services	City Service Price	4	/CY														52	CY	208
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	<b>Subtotal</b>																				1248
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	10.06	/CY						57										573
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	02315 400 1300	1.3	/CY																96
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. tr	02320 200 0320	3.08	/CY																229
	Disposal Costs	On site disposal	02220 875 5550	6.3	/CY																486
	<b>Subtotal</b>																				1364
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	<b>Subtotal</b>																				
	<b>Total</b>																				2612

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Facilities Area 01															302508
Facilities Area 02															118247
Stream Channel 03															31615
Gabion Basin 04															
Refuse Pile 05															70265
Subtotal															522835

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Dugout Mine Facilities Area 01 Cut and Fill at Mine Site															
Equipment															
Rough Grading															
D9R Semi-U EROPS (9-43) (3Q02)	17060	64.8	0.1	49.35	227.26	1	227.26 \$/HR		118169 CY		184 CY/HR		642.2 HR		145946
Finished Grading															
D9R Semi-U EROPS (9-43) (3Q02)	17060	64.8	0.1	49.35	227.26	1	227.26 \$/HR		19926 CY		680 CY/HR		29.3 HR		6659
815F ((6-5) (4Q02))	9045	31.95	0.1	47.15	138.83	1	138.83 \$/HR		58490 CY		876 CY/HR		66.8 HR		9274
CAT 345BL 2000 (10-8)(3Q02)	14385	49.4	0.1	49.35	193.6	1	193.6 \$/HR		10000 CY		308 CY/HR		32.5 HR		6292
966G EROPS (9-27) (3Q02)	6815	26.05	0.1	49.35	120.6	1	120.6 \$/HR		8342 CY		204 CY/HR		40.9 HR		4933
Support Personnel and Labor															
CLAB					38.5	1	38.5 \$/HR						642.2 HR		24725
5,000 gal H2O truck Diesel (20-6) (2Q02)	4895	27.15	0.1	39.15	99.61	1	99.61 \$/HR						642.2 HR		63970
Pickup Truck Crew 4x4 1 ton (20-7) (2Q02)	880	3.85	0.1	0	9.74	1	9.74 \$/HR						642.2 HR		6255
Foreman Average, Outside					53.65	1	53.65 \$/HR						642.2 HR		34454
Subtotal															302508

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Dugout Mine Facilities Area 02 Topsoil Disturbution															
Move topsoil															
D9R Semi-U EROPS (9-43) (3Q02)	17060	64.8	0.1	49.35	227.26	1	227.26	\$/HR	21460	CY	184	CY/HR	116.6	HR	26499
Pocking Handled in Vegetation Section															
966G EROPS (9-27) (3Q02)	6815	26.05	0.1	49.35	120.6	1	120.6	\$/HR	21460	CY	204	CY/HR	105.2	HR	12687
6X4 75,000lbs 12-18 CY (20-1) (2Q00)	3580	25.05	0.1	38.1	88.03	6	528.18	\$/HR	21460	CY	204	CY/HR	105.2	HR	55565
Support Personel and Labor															
CLAB					38.5	1	38.5	\$/HR					116.6	HR	4489
5,000 gal H2O truck Diesel (20-6) (2Q02)	4895	27.15	0.1	39.15	99.61	1	99.61	\$/HR					116.6	HR	11615
Pickup Truck Crew 4x4 1 ton (20-7) (2Q02)	880	3.85	0.1	0	9.74	1	9.74	\$/HR					116.6	HR	1136
Foreman Average, Outside					53.65	1	53.65	\$/HR					116.6	HR	6256
Subtotal															118247

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Dugout Mine Stream Channel 03 Remove Culvert and Restore Channel															
CAT 330BL 2001 (10-8)(3Q02)	10860	38.05	0.1	49.35	159.08	1	159.08	\$/HR	14400	CY	310	CY/HR	46.5	HR	7397
CLAB					38.5	0.5	19.25	\$/HR					46.5	HR	895
966G EROPS (9-27) (3Q02)	6815	26.05	0.1	49.35	120.6	1	120.6	\$/HR	1500	CY	204	CY/HR	7.4	HR	892
CLAB					38.5	0.5	19.25	\$/HR					7.4	HR	142
6X4 70,000lbs 12-18 CY (20-1) (2Q02)	3520	22.95	0.1	39.15	86.4	1	86.4	\$/HR	7000	CY	50	CY/HR	140	HR	12096
CLAB					38.5	0.5	19.25	\$/HR					140	HR	2695
Support															
Foreman Average, Outside					53.65	1	53.65	\$/HR					46	HR	2468
5,000 gal H2O truck Diesel (20-6) (2Q02)	4895	27.15	0.1	39.15	99.61	1	99.61	\$/HR					46	HR	4582
Pickup Truck Crew 4x4 1 ton (20-7) (2Q02)	880	3.85	0.1	0	9.74	1	9.74	\$/HR					46	HR	448
Subtotal															31615

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Ref.	Description	Materials	Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost		
	Dugout Mine Vegetation																					
	Soil Preparation																					
	Pocking	Excavation Bulk Bank 2 CY (3228L)	02315 400 0260	1.73	/CY					14.56						AC		23490	CY	40638		
	Subtotal																			40638		
	Fence																					
	Silt Fence	Silt fence	02370 550 1100	0.97	LF	6800										FT		6800	FT	6596		
	Chicken Wire	Fence Chicken Wire	02820 500 0100	6.55	LF	3400										FT		3400	FT	22270		
	Subtotal																			28866		
	Seed Mix No 1																					
	Hydroseed Equipment and Labor	Hydro Spreader (equip. & labor) B-81	Reveg005	19.01	/MSF					13.9						AC		605	MSF	11501		
	Hydroseed Material	Dugout Seed Mix No 1	Dugout 07391	394.75	/AC					13.9						AC		13.9	AC	5487		
	Transplant Area No 1																					
	Area									13.9												
	Transplant Materials																					
		Snowberry		\$0.66	EA											75	/AC		1043	EA	688	
		Utah Serviceberry L		\$0.66	EA											75	/AC		1043	EA	688	
		Pinyon Pine		\$0.59	EA											200	/AC		2780	EA	1640	
		Utah Juniper		\$0.66	EA											200	/AC		2780	EA	1835	
	Transplant Labor	Bare root seedlings, 6" to 10"	02912 350 0711	1.21	Ea															7646	EA	9252
	Seed Mix No 2																					
	Hydroseed Equipment and Labor	Hydro Spreader (equip. & labor) B-81	Reveg005	19.01	/MSF					2.45						AC		107	MSF	2034		
	Hydroseed Material	Dugout Seed Mix No 2	Dugout 07392	362.25	/AC					2.45						AC		2.45	AC	888		
	Transplant Area No 2																					
	Area									2.45												
	Transplants Riparian																					
	Area									2.45												
	Transplant Materials																					
		Narrowleaf Cottonw		\$0.83	EA											250	/AC		613	EA	509	
		Rocky Mountain Ma		\$1.00	EA											250	/AC		613	EA	613	
		Willow		\$0.84	EA											4000	/AC		9600	EA	8232	
		Woods Rose		\$0.55	EA											1000	/AC		2450	EA	1348	
		Snowberry		\$0.66	EA											250	/AC		613	EA	406	
		Utah Serviceberry L		\$0.66	EA											250	/AC		613	EA	406	
		Blue Elderberry		\$8.95	EA											250	/AC		613	EA	5486	
		Chokecherry Lone F		\$0.73	EA											250	/AC		613	EA	447	
		Golden Current		\$0.66	EA											250	/AC		613	EA	406	
		Carex Spp.		\$0.75	EA											500	/AC		1225	EA	919	
		Horsetail		\$0.75	EA											500	/AC		1225	EA	919	
	Transplant Labor	Bare root seedlings, 6" to 10"	02912 350 0711	1.21	Ea															18991	EA	22979
	Subtotal																			76880		
	Direct Vegetation																					
	Reseeding																					
	Assume 25% reveg rate																					
	Total																			182730		

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Ref.	Description	Materials	Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Dugout Mine Refuse Pile																				
	Soil Preparation																				
	Pocking	Excavation Bulk Bank 2 CY (322BL)	02315 400 0260	1.73	/CY					15.6						AC		25168	CY	43541	
	Subtotal																			43541	
	Seed Mix No 1																				
	Hydroseed Equipment and Labor	Hydro Spreader (equip. & labor) B-81	Reveg005	19.01	/MSF					15.6						AC		680	MSF	12927	
	Hydroseed Material	Dugout Seed Mix No 1	Dugout 07391	394.75	/AC					15.6						AC		15.6	AC	6156	
	Transplant Area No 1																				
	Area									15.6											
	Transplant Materials		Black Sagebrush	\$0.40	EA											200	/AC		3120	EA	1248
			Schalscale	\$0.75	EA											200	/AC		3120	EA	2340
	Transplant Labor	Bare root seedlings, 6" to 10"	02912 350 0711	1.21	Ea														6240	EA	7550
	Subtotal																				30223
	Reseeding																				
	Assume 25% reveg rate																				7556
	Subtotal																				7556
	Total																				61320

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Ref.	Description	Materials	Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Degas Well G1																			
	Soil Preparation																			
	Pocking	Excavation Bulk Bank 2 CY (322BL)	02315 400 0280	1.73	/CY					0.6						AC		968	CY	1675
	Subtotal																			1675
	Seed Mix No 1																			
	Hydroseed Equipment and Labor	Hydro Spreader (equip. & labor) B-81	Reveg005	19.01	/MSF					0.6						AC		26	MSF	494
	Hydroseed Material	Dugout Seed Mix No 1	Dugout 07391	394.75	/AC					0.6						AC		0.6	AC	237
	Subtotal																			731
	Direct Vegetation																			2406
	Reseeding																			
	Assume 25% reveg rate																			602
	Total																			3008

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Ref.	Description	Materials	Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Degas Well G2																			
	Soil Preparation																			
	Packing	Excavation Bulk Bank 2 CY (322BL)	02315 400 0260	1.73	/CY					1.21						AC		1952	CY	3377
	Subtotal																			3377
	Seed Mix No 1																			
	Hydroseed Equipment and Labor	Hydro Spreader (equip. & labor) B-81	Reveg005	19.01	/MSF					1.21						AC		53	MSF	1008
	Hydroseed Material	Dugout Seed Mix No 1	Dugout 07391	394.75	/AC					1.21						AC		1.21	AC	478
	Subtotal																			1496
	Direct Vegetation																			4863
	Reseeding																			
	Assume .25% reveg rate																			1216
	Total																			6079

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Ref.	Description	Materials	Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Degas Well G3																			
	Soil Preparation																			
	Packing	Excavation Bulk Bank 2 CY (322BL)	02315 400 0280	1.73	/CY					0.97						AC		1565	CY	2707
	Subtotal																			2707
	Seed Mix No 1																			
	Hydroseed Equipment and Labor	Hydro Spreader (equip. & labor) B-81	Reveg005	19.01	/MSF					0.97						AC		42	MSF	798
	Hydroseed Material	Dugout Seed Mix No 1	Dugout 07391	394.75	/AC					0.97						AC		0.97	AC	383
	Subtotal																			1181
	Direct Vegetation																			3868
	Reseeding																			
	Assume 25% reveg rate																			972
	Total																			4890

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Canyon Fuel Company, LLC  
Dugout Canyon Mine

Methane Degassification Amendment  
August 28, 2003

**CHAPTER 2**  
**SOILS**

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<b>Attachment 2-2</b>	Topsoil Calculations

## **210 INTRODUCTION**

This chapter and associated attachments address the pertinent data required for the addition of the degassification well sites for the Dugout Canyon Mine. Only those sections of the Division regulations that apply to the well sites have been addressed. The remainder of the regulations have already been addressed in the existing M&RP. The M&RP and this document contain pertinent information relating to the identification, management, and reclamation activities associated with the soil resources.

## **220 ENVIRONMENTAL DESCRIPTION**

The well sites range in elevation from approximately 8100 to 8400 feet. The well sites are located in the Pace Canyon area of the Book Cliffs. General vegetation includes sagebrush, serviceberry, aspen, Douglas-fir, and snowberry.

### **221 Prime Farmland Investigation**

Due to limiting terrain, lack of water for irrigation and no evidence of past cultivation of the sites, it is concluded that no prime farmland exists within the area of the well site disturbance.

### **222 Soil Survey**

#### **222.100 Soils Map**

The soils have been mapped as part of the Soil Survey of the Carbon Area, Utah by the Soil Conservation Service (1988), at an Order III intensity level.

A description of the soils is included in Appendix 2-2 of the approved M&RP and in Attachment 2-1, which includes a report by Dan Larsen, Soil Scientist, entitled "Soil Inventory and Assessment Six Methane Degassification Borehole Sites".

#### 222.200 Soil Identification

<u>Well No.</u>	<u>Soil Map Unit</u>	<u>Soil Components</u>
G-1	62/88	Midfork-Comodore complex, Rabbitex-Datino Varient
G-2	7	Brycan, Beje-Trag complex, 3-30% slopes
G-3	7	Beje-Trag complex, 3-30% slopes

#### 222.300 Soil Description

Refer to Attachment 2-1 of the submittal for soil descriptions.

#### 222.400 Soil Productivity

The depth of topsoil at each site was measured to determine the amount of growth medium available for reclamation. The following table lists each well site and the approximate amount of growth medium available.

**TABLE 2-1**  
**Topsoil Volumes**

<b>Well No.</b>	<b>Cubic Yards of Material</b>
G-1	415
G-2	3,104
G-3	1,182

Figure 5-1 through Figure 5-12 show the layout and approximate size of each well pad. Topsoil volume calculations can be found in Attachment 2-2.

Estimated topsoil salvage from the G-1 well site will average about 7". This site on a ridge top has previously been disturbed for exploration drilling. The site has pockets of fractured sandstone bedrock at the surface and stony subsoils, which are the limiting factors in the quantity of salvageable topsoil. The average topsoil depth at well site G-2 is 30". The average topsoil thickness for well site G-3 is 10". However, enough soil will be stripped to allow 12" of soil to be placed during reclamation. Thus some subsoils will be stripped with the topsoil to generate the required volume. Available topsoil at each site will be salvaged and stockpiled.

### **223 Soil Characterization**

The topsoil evaluation described in this chapter was performed by Daniel M. Larsen, Professional Soil Scientist in accordance with the standards of the National Cooperative Soil Survey.

### **224 Substitute Topsoil**

Dugout Canyon does not plan to use substitute topsoil as growth media except as described in Section 222.400.

## 230 OPERATION PLAN

### 231 General Requirements

#### 231.100 Removing and Storing Topsoil Methods

The topsoil will be removed, stockpiled and protected with a berm and/or silt fence. A qualified person will be on site during soil salvage to monitor and supervise the operation for the purpose of maximizing salvage volumes.

After the topsoil is removed, the mud pit will be excavated and the soils from the mud pit excavation will be stored immediately adjacent to the mud pit. **Mud pit excavation of subsoil will be approximately 97 CY at each well site. However at Well G-1, a portable container for drilling fluids will be used if necessary, should there not be sufficient subsoil depth to excavate a mud pit.**

Topsoil beneath the topsoil stockpiles will not be removed. Ribbon or a marking fabric will be placed on top of the topsoil prior to placement of the topsoil from the well pad area.

**The approximate volume of subsoil to be salvaged and used to create berms around the perimeter of the well site including the topsoil stockpile perimeter is: G-1 - 161 CY; G-2 - 254 CY and G-3 - 208 CY.**

#### 231.200 Suitability of Topsoil Substitutes/Supplements

See Section 224.

### **231.300 Testing of Topsoil Handling and Reclamation Procedures Regarding Revegetation**

Dugout will exercise care to guard against erosion during and after application of topsoil and will employ the necessary measures to ensure the stability on graded slopes. Erosion control measures will include silt fences, berms, seeding, straw bales, soil roughening, and mulching of the soils.

Topsoil will be redistributed and the original soil surface beneath the topsoil stockpile will be roughened as presented in Section 242.100 and seeded with the seed mix described in Chapter 3, Section 352.

Methods used to evaluate success of revegetation and stabilization are discussed in Chapter 3, Section 356.

### **231.400 Construction, Modification, Use, and Maintenance of Topsoil Storage Pile**

Topsoil removed from the drill pad sites will be stockpiled on the site. The estimated volumes of topsoil stockpile for each site are shown in Table 2-1. The stockpiles will be sized as shown in Table 2-2.

The slopes of the stockpile will be 1H:1V or approximately 45°. Soils in these areas generally have an angle of repose greater than 50 degrees, making a stockpile with 1:1 slopes feasible. The steeper slope also help minimize the area to be disturbed.

**TABLE 2-2**  
**Topsoil Stockpile Dimensions\***

Well No.	Length (ft)	Width (ft)	Height (ft)
G-1	55	35	16
G-2	156	50	20
G-3	70	60	17

\* These are approximate dimensions of the topsoil stockpile and construction dimensions may vary.

See Section 234.200 for detailed information on the topsoil stockpile(s).

### **232 Topsoil and Subsoil Removal**

#### **232.100 Topsoil Removal and Segregation**

All topsoil will be removed as a single layer with no segregation. Topsoil will be removed using a dozer and/or loader. Refer to Section 231.100 for additional details.

#### **232.200 Poor Topsoil**

No poor soils exist at the well sites see Attachment 2-1.

#### **232.300 Thin Topsoil**

Not applicable see Attachment 2-1.

#### **232.400 Minor Disturbances Not Requiring Topsoil Removal**

Topsoil will not be removed along the fence line at the wells sites.

### **232.500 Subsoil Segregation**

The B and C soil horizons will not be removed. Any small quantity of subsoil removed with the topsoil will not be segregated.

### **232.600 Timing**

Topsoil removal will take place after all vegetation that could interfere with salvaging the topsoil has been grubbed. **The grubbed vegetation will be hauled offsite for disposal, either at a licensed landfill or to a location on private land, as dictated by the landowner.** ~~moved to the disturbed area perimeter.~~

### **232.700 Topsoil and Subsoil Removal Under Adverse Conditions**

The topsoil will be removed first and stockpiled and the remaining soil horizons will be left in place, except where natural conditions render removal operations hazardous or detrimental to soils outside the disturbed area then topsoil will not be removed.

**Conventional Machines** - In locations where steep grades, adverse terrains, severe rockiness, limited depth of soils, or other adverse conditions exist that render soil removal activities using conventional machines hazardous, soils will not be salvaged and stockpiled. Such conditions are not likely to occur in these areas.

**Substitute Topsoil** - Importing of substitute topsoil is not anticipated (Section 224).

### **233 Topsoil Substitutes and Supplements**

#### **233.100 Overburden Materials Supplementing and/or Replacing Topsoil**

No overburden material will be used.

#### **233.200 Suitability of Topsoil Substitutes and Supplements**

No substitute topsoil is planned.

#### **233.300 Physical and Chemical Analysis**

See Section 243.

#### **233.400 Testing of Substitute Topsoil**

No substitute topsoil is planned.

### **234 Topsoil Storage**

#### **234.100 Topsoil Stockpiling**

Topsoil will be stockpiled for later use in reclamation operations.

#### **234.200 Topsoil Stockpile**

**Stable Stockpile Site** - Stockpiled material will be placed on a stable site.

**Protection from Contaminants and Compaction** - To protect the topsoil from contaminants and unnecessary compaction that could interfere with vegetation, the stockpile will be isolated from

the main surface area by a berm and/or silt fence. A sign designating "topsoil" will be installed on the stockpile.

The topsoil stockpile will be constructed in such a manner as to allow access for repair of the pile surfaces and diversion structures.

**Wind and Water Erosion Protection** - The topsoil stockpile will be protected from water erosion by berms, which trap sediment runoff from the stockpile. The berms have been designed to completely contain the 10-year 24-hour storm event (see Attachment 7-1). The stockpile will be surface pitted and/or roughened and revegetated using the grass seeds listed in Table 3-2 to prevent wind erosion.

**Topsoil Redistribution** - Stockpile soil will not be moved until redistribution during contemporaneous or final reclamation operations unless approved by the Division.

#### **234.300 Topsoil Stockpile Relocation**

Stockpiled soil in jeopardy of being detrimentally affected in terms of its quantity and quality by drilling operations may be temporarily redistributed or relocated on approval by the Division and modification of this M&RP.

### **240 RECLAMATION PLAN**

#### **241 General Information**

Reclamation of the degassification sites (topsoil redistribution, amendments, and stabilization) is discussed in Sections 242, 243, and 244 respectively.

## 242 Soil Redistribution

### 242.100 Soil Redistribution Practices

The topsoil will be placed after recontouring of the site has occurred. Topsoil will be handled when they are loose or in a friable condition. The moisture content will be visually monitored and water will be added as needed to enhance the soil's condition for handling. The approximate amount of topsoil available for each site is shown in Table 2-1. The reclamation time line can be found on Figure 5-15.

The topsoil will be distributed in two phases, the first phase will be the contemporaneous reclamation of a portion of the pad area used during well construction (see Figures 5-4, 5-8 and 5-12). ~~During this phase the berms surrounding the disturbed pad area will be used as topsoil. When needed additional topsoil will be used from the topsoil stockpile.~~ **During contemporaneous reclamation topsoil from the stockpile will be distributed on each site in the depths shown in Table 2-3.**

Final reclamation will occur after venting of the methane gas is complete, venting equipment has been removed and the well has been plugged. ~~The topsoil for this phase will come from the topsoil pile and the berms surrounding the operational pad area.~~ The topsoil stockpile storage area and access road will be reclaimed during this final phase. Refer to Section 341 for additional information.

**Soil Thickness** - The topsoil will be distributed **during contemporaneous and final reclamation** in the thickness shown in Table 2-3.

**TABLE 2-3**  
**Approximate Topsoil Distribution Thickness**

<b>Well Site No.</b>	<b>Topsoil Thickness (Inches)</b>
G-1	7
G-2	30
G-3	12

**Compaction** - Prior to the application of topsoil, compacted subsoils will be roughened or loosened for a depth of 18 to 24 inches. To prevent compaction of topsoil, soil moving equipment will refrain from unnecessary operation over spread topsoil. The topsoil will be in a loosened condition prior to seeding.

**Following the drying of the mud pit materials**, the dirt excavated to create the mud pit will be mixed with the drill cutting and returned to the pit to prevent a boundary of hard material from forming in the mud pit area that would hamper root penetration **and then compacted to minimize settling**.

**Erosion** - Care will be exercised to ensure the stability of topsoil on graded slopes to guard against erosion during and after topsoil application. Post reclamation (contemporaneous and final) erosion control measures will be surface roughing, mulching and seeding.

#### **242.200 Regrading**

The area will be graded to the approximate original topographic configuration.

#### **242.300 Topsoil Redistribution on Impoundments and Roads**

The mud pits will be dismantled during contemporaneous reclamation and reclaimed with the portion of the well pad area not remaining during the well operational phase (see Figures 5-4, 5-8, and 5-12). The roads existing prior to starting the drilling program will not be reclaimed. Access

roads built to allow entrance to the drilling pads will be reclaimed and will receive topsoil in the same depth as their corresponding pad areas when methane venting is complete.

### **243 Soil Nutrients and Amendments**

The soils will be analyzed directly following salvage to determine if amendments are needed. Testing of the topsoil will be done according to Table 6 of the Division's Topsoil and Overburden Guidelines. The topsoil will be tested at a minimum for the following parameters: pH, electrical conductivity, total carbon, SAR, water holding capacity, plant available nitrogen, and phosphorus.

**Results of these analyses will be incorporated into Attachment 2-2.**

### **244 Soil Stabilization**

#### **244.100 Protection and Stabilization of Surface Area**

All reclaimed areas will be stabilized to control erosion by application of mulch, tackifier, and roughening of the surface. The areas will be graded to the approximately original topographic configuration. Seeding will be accomplished with the application of seeds and mulch with a long fiber tackifier. Methods of protection and stabilization are further discussed in Chapter 3, Section 341.

#### **244.200 Mulch Application**

Mulch/tackifier will be applied to stabilize the soil on all areas that have been regraded and covered with growth media. For further discussion of revegetation practices to be utilized, see Chapter 3, Section 341.

### **244.300 Rills and Gullies**

**Postmining Land Use and Revegetation** - Rills and gullies that are approximately nine (9) inches in depth and disrupt the postmining land use or reestablishment of vegetative cover will be regraded and seeded.

**Water Quality** - There are no streams immediately adjacent to the well sites.

## **250 PERFORMANCE STANDARDS**

### **251 Topsoil, Subsoil, and Topsoil Supplements Management**

All topsoil, subsoil, and topsoil supplements will be managed as outlined in Sections 230 and 240.

### **252 Stockpiled Topsoil and Subsoil**

All stockpiled topsoil and subsoil will be managed according to plans outlined in Sections 230 and 240.

Canyon Fuel Company, LLC  
Dugout Canyon Mine

Methane Degassification Amendment  
August 28, 2003

**CHAPTER 3**  
**BIOLOGY**

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### **310 INTRODUCTION**

This chapter presents a description of the biological resources found on the Dugout Canyon degas well site areas.

#### **311 Vegetative, Fish and Wildlife Resources**

Vegetative, fish, and wildlife resource conditions in and adjacent to the proposed degassification wells are discussed in Section 320 of this submittal and the approved M&RP.

#### **312 Potential Impacts to Vegetative, Fish, and Wildlife Resources**

Potential impacts to vegetative, fish, and wildlife resources and the associated mitigation plan is presented in Sections 330 and 340 of this chapter.

#### **313 Description of Reclamation Plan**

The reclamation plan used to restore the vegetative, fish, and wildlife resources to a condition suitable for the post mining land use is presented in Section 340.

### **320 ENVIRONMENTAL DESCRIPTION**

#### **321 Vegetation Information**

This section and the approved M&RP contain the environmental descriptions of the vegetation for the permit and adjacent areas.

### 321.100 Plant Communities Within the Proposed Permit Area

During June 2003, the degassification well sites were surveyed by Patrick Collins, Mt. Nebo Scientific). The report and survey for the areas are included in Attachment 3-1.

### 321.200 Land Productivity Prior to Mining

Productivity of the well site lands prior to mining are shown in Table 3-1. ~~The productivity is based on data for similar sites from the U.S. Department of Agriculture.~~

**TABLE 3-1**  
**Land Productivity**

<b>Well No.</b>	<b>Productivity (lbs.) Per Acre</b>
G-1 (Previously Disturbed)	300
G-2	1,500
G-3	1,500
Aspen, Maple, Douglas Fir Reference Area	
Sagebrush, Snowberry, Grass Reference Area	

### 322 Fish and Wildlife Information

Fish and wildlife information associated with the degas wells is provided in this chapter. A summary of the fish and wildlife resource information for the permit and adjacent areas is contained in Sections 322.100 through 322.200 of the approved M&RP.

#### 322.100 Level of Detail

The scope and level of detail within the approved M&RP "Methane Degassification Amendment" are sufficient to design the protection and enhancement plan for wildlife and fish in the area associated with the degas wells. Additional information pertaining to fish and wildlife in the permit area is located in the M&RP.

#### 322.200 Site-Specific Resource Information

**Raptors** - An aerial raptor nest survey was done of the area by the Utah Division of Wildlife Resource (DWR, Chris Colt, Leroy Mead) and CFC personnel in May of 2003, refer to Attachment 3-3.

No raptor nests were recorded during the survey in the area (portions of N1/2SE1/4NW1/4 and N1/2SW1/4NE1/4 of Section 24; a portions of N1/2SW1/4NW1/4 Section 19, Township 13 South, Range 13 East) of the degas wells. Refer to Figure 1-1 for mapped well locations.

A raptor survey will be conducted of the well site areas, each year that the wells are in operation.

**Bats** - No known open mine shafts, caves, adits or other man made structures that might provide habitats for bats are known to exist in the degas project area. The sites are open, with limited trees and the lack of a food source would force the bats to seek habitat and nourishment elsewhere.

**Mexican Spotted Owl** - In the Summer of 2003, a calling point survey was conducted in the degas well area by EIS Environmental and Engineering Consulting. The survey report concluded that "within the project area, a thorough search did not reveal the presence of any Mexican spotted owls". The report is included in Attachment 3-2.

**Threatened and Endangered Plant and Wildlife Species** - There are no known federally or state listed threatened and endangered plant and wildlife species within the sites planned for degassification wells.

There are no known groundwater or surface water flows to the Colorado or Green Rivers with potential for impact by the drilling of the degas wells. Potential adverse affects to the four Colorado River endangered fish species (refer to table below) would not be likely since there is no direct route to the Colorado River or Green River from the proposed well locations. Per the Windy Gap Process (referenced by personal communication Jerriann Ernstsens, 8/19/03) consumption estimates for the degas wells: evaporation from ventilation - zero, drill holes will not intersect the coal seam being mined, therefore no access to mine ventilation until after area is sealed; coal preparation - zero, no coal preparation at degas sites (see Sections 522 and 523); sediment pond evaporation - zero, no sediment pond at degas sites (see Section 732.200); subsidence effects on springs - zero, no anticipated subsidence at degas sites (see Section 525); alluvial aquifer abstractions into mines - zero, no alluvial aquifer abstractions associated with degas drill holes (see Sections 513.500 and 600); postmining inflow to workings - zero, no workings for postmining inflow associated with degas wells (see Sections 513.500 and 600); coal moisture loss - zero, no coal therefore no moisture loss (see Sections 522 and 523); direct diversion - zero, no direct diversions associated with degas wells (see Sections 522 and 523). Mitigation will not be required since the estimated loss for the construction and reclamation of the degas holes is zero acre feet per year.

**Federal and State Listed, Threatened, Endangered and Candidate Species  
Plants and Wildlife  
Carbon County, Utah  
October 2002**

Common Name	Scientific Name	Status	Habitat Present*
<b>Plants</b>			
Uinta Basin Hookless Cactus	<i>Sclerocactus glaucus</i>	T	No habitat available
Graham Beardtongue	<i>Penstemon grahamii</i>	C	No habitat available
<b>Fish</b>			
Humpback Chub	<i>Gila cypha</i>	E	No habitat available
Roundtail Chub**	<i>Gila robusta</i>	T	No habitat available
Bonytail	<i>Gila elegans</i>	E	No habitat available
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	E	No habitat available
Razorback Sucker	<i>Xyrauchen texanus</i>	E	No habitat available
<b>Birds</b>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	No habitat available, See Attachment 3-3
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	C	No habitat available
Peregrine Falcon**	<i>Falco Peregrinus</i>	D	See definition of 'D' below
Ferruginous Hawk**	<i>Buteo Regalis</i>	T	No habitat available
Southwestern Willow Flycatcher**	<i>Empidonax traillii extimus</i>	E	No habitat available
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T	See Attachment 3-2
<b>Mammals</b>			
Black-footed Ferret	<i>Mustela nigripes</i>	EX	No habitat available

\* Habitat availability in Carbon County/Dugout Mine/Degas Well Sites.

\*\* Utah State Listed Species - Information verified with Bill Bates, DWR (personal communication 7/17/03)

E = A taxon that is listed by the U.S. Fish and Wildlife Service as "endangered" with the possibility of worldwide extinction.

T = A taxon that is listed by the U.S. Fish and Wildlife Service as "threatened" with becoming endangered.

C = A taxon for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threats to justify it being a "candidate" for listing as and endangered or threatened.

D = In the process of being delisted, process began in 2000.

Source: Utah Division of Wildlife Resources data base - created 10/24/02

### **322.300 Fish and Wildlife Service Review**

If requested, Dugout Canyon authorizes the release of information pertaining to Section 322 and 333 to the U. S. Fish and Wildlife Service Regional and Field Office for their review.

### **323 Maps and Aerial Photographs**

Location of the well sites can be seen in Figure 1-1 of this submittal.

### **323.100 Location and Boundary of Proposed Reference Area**

Reference areas for the degassification wells were established during the vegetative study conducted in the Summer of 2003. Well sites G-2 and G-3 will be compared to the Sagebrush/Snowberry/Grass reference area and G-1 to the Aspen/Maple/Douglas Fir reference area. Refer to Attachment 3-1 and Figure 3-1 for the location of the reference areas.

### **323.200 Elevation and Locations of Monitoring Stations**

Refer to Section 323.200 of the approved M&RP.

### **323.300 Facilities for Protection and Enhancement**

Section 333.300 and 358.500 of the approved M&RP contain additional discussion pertaining to protective measures to be taken by Dugout Canyon on behalf of wildlife.

### **323.400 Vegetation Type and Plant Communities**

Vegetative types and plant communities are outlined in the vegetative report in Attachment 3-1. ~~Plate 3-1 in the approved M&RP~~ **Figure 3-2** gives details of the vegetation types located adjacent to the well sites.

## **330 OPERATION PLAN**

### **331 Measures Taken to Disturb the Smallest Particle Area**

The well sites will be sized to disturb the smallest acreage possible and still meet the requirements for the drilling equipment. The drainage control required will be built to satisfy the environmental requirements.

### **332 Description of Anticipated Impacts of Subsidence**

Refer to Section 525.

### **333 Plan to Minimize Disturbances and Adverse Impacts**

General control and mitigation measures addressing potential related biological impacts will include the following:

- Minimizing the total area of disturbance,
- Design, construction, and operation of the well sites to minimize biological impacts including ~~barriers to wildlife movement~~;
- Exclusion of wildlife from potentially hazardous areas, and
- Reclamation of disturbed areas when they are no longer needed.

All water associated with the drilling of these wells will be appropriated and hauled to the sites by a licensed contractor. Since the drilling of degas wells does not involve the mining of coal, the USWFS consumption requirements for underground operations do not apply (i.e., evaporation from ventilation, coal preparation, sediment pond evaporation, subsidence of springs, alluvial aquifer abstractions into the mine, postmining inflow to workings, coal moisture loss, direct diversions).

#### **333.100 Minimize Disturbance to Endangered or Threatened Species**

Dugout Canyon will apply all methods necessary to minimize disturbances or any adverse effects to threatened or endangered species. See Section 322.200.

#### **333.200 Species and Habitats**

All species and habitats within the permit area will be protected to the best of Dugout Canyon's ability.

### **333.300 Protective Measures**

Refer to Section 333.300 of the approved M&RP.

## **340 RECLAMATION PLAN**

### **341 Revegetation**

Revegetation of the sites will occur in two phases. The first phase is to redistribute topsoil and seed the well area not needed for access and operation of the gas exhaust blower. The second phase will consist of plugging the well and distributing the remaining topsoil and seeding on the remaining pad area. Refer to Section 242.100 for additional detail.

The short-term goal of this revegetation plan is the immediate stabilization of the disturbed sites through erosion control. This objective will be achieved through controlled grading practices, proper seedbed preparation to encourage rapid plant establishment, inclusion of rapidly establishing species in the seed mixture to be planted, and mulch application.

The long-term goals are to establish useful, and productive range. These goals will be attained through the selection and placement of desirable and productive plant species and a commitment to monitor and maintain revegetated areas throughout the bond liability period.

The well sites will be fenced to discourage wildlife and livestock from grazing the reclaimed areas until bond release.

### **341.100 Schedule and Timetable**

The reclamation timetable is shown in Figure 5-15 of this submittal and the reclamation monitoring schedule is found in Chapter 3, Table 3-3 of the approved M&RP.

### 341.200 Descriptions

**Species and Amounts of Seed** - The well sites will be planted with the seed mix listed on Table 3-2. The seed mix will be used in both contemporaneous and final reclamation phases. The seed will be incorporated with **a small amount of wood fiber mulch and applied by hydroseeding equipment**. Refer to Section 234.200 for topsoil stockpile seeding description.

**Methods Used for Planting and Seeding** - The degassification sites will be graded to final contour, then ripped to relieve compaction. The depth of ripping will be from 18 to 24 inches. Following ripping, topsoil will be applied to the ripped surface and left in a roughened state.

**Mulching Techniques** - ~~Organic~~ **Wood fiber** mulch will be applied **on top of the seed with hydroseeding equipment** at the rate of 2,000 pounds per acre and anchored with a tackifier.

**Irrigation, Pest, and Disease Control** - No irrigation is planned and pesticides will not be used unless previously approved by the Division.

**Measures Proposed for Revegetation Success** - Refer to Section 356.

### 341.300 Greenhouse Studies, Field Trials or Other Equivalent Studies

Refer to the Section 341.300 of the approved M&RP.

### 342 Fish and Wildlife

~~Prior to collecting and stockpiling topsoil, large rocks and large woody vegetation (limited) will be removed and piled on disturbed area perimeter. The rocks and woody vegetation will be used as habitat enhancement following revegetation of the sites.~~

### **342.100 Enhancement Measures**

~~No enhancements are planned other than those described in the this section.~~ Post bond release enhancement measure will include the establishment of vegetation for wildlife food, cover, and the break up of large blocks of monoculture to diversify habitat.

### **342.200 Plants Used for Wildlife Habitat**

**Nutritional Value** - The nutritional value will be consistent with that of vegetation in the surrounding areas.

**Cover** - Cover will be comparable to the cover on the associated reference area.

### **342.300 Cropland**

Cropland is not a postming land use.

### **342.400 Residential, Public Service, and Industrial Land Use**

No residential, industrial or public service use is planned.

## **350 PERFORMANCE STANDARDS**

### **351 General Requirements**

Dugout Canyon commits to conduct all operations in accordance with the plans submitted in Sections R645-301-330 through R645-301-340 of the permit application.

### **352 Contemporaneous Reclamation**

Reclamation activities prior to final reclamation will to the extent feasible, be performed contemporaneously. Contemporaneous reclamation will be performed at the well sites following construction of the wells. Refer to Section 341 for additional details.

### **353 Revegetation: General Requirements**

A vegetative cover will be established on all reclaimed areas to allow for the designated postmining land use of grazing. Refer to Section 411 for additional information.

#### **353.100 Vegetative Cover**

The seed mix proposed for revegetation is intended to provide vegetative cover that will be diverse, effective, and permanent. The seed mixture was selected with respect to the climate, potential seedbed quality, erosion control, drought tolerance, and the mixture's ability for quick establishment and spreading.

**Native Species** - The reclamation vegetation mixture will be comprised of species indigenous to the area and capable of achieving the postmining land use. Diversity of species should allow utilization of plants by wildlife and domestic livestock. The recommended seed mix is comprised of native species.

**Extent of Cover** - The vegetative cover will be at least equal in extent to the cover at the designated reference areas.

**Stabilizing** - The vegetative cover mixture is capable of stabilizing the soil surfaces from erosion.

**Table 3-2**  
**Reclamation Seed Mix**

<u>SPECIES</u>	<u># pls/acre</u>	<u># pls/sq. ft.**</u>
<b>Grasses, Forbs, and Shrubs</b>		
Kentucky Bluegrass (1,390,000 seeds/lb)*	0.5	16
Mountain Brome (64,000 seeds/lb)*	2.0	3
Sandberg Bluegrass (1,100,000 seeds/lb)*	1.0	25
Bluebunch Wheatgrass (126,000 seeds/lb)*	4.0	12
Bottlebrush Squirreltail (192,000 seeds/lb)*	1.0	4
Rocky Mountain Penstemon (478,000 seeds/lb)*	1.0	11
Mountain Lupine (12,000 seeds/lb)*	3.0	1
Mtn. Snowberry (54,000 seeds/lb)*	4.0	5
Wyoming Big Sage (2,500,000 seeds/lb)*	<u>0.5</u>	<u>29</u>
TOTAL	17	106

\* Native Plants

\*\* Rounded nearest whole seed

### **353.200 Reestablished Plant Species**

**Compatible** - The reestablished plant species have been selected to insure their compatibility with the approved postmining use.

**Seasonal Characteristics** - The revegetation plant species will have the same growing season as the adjacent areas.

**Self-Generation** - The reestablished plants are species capable of self-generation and plant succession.

**Compatibility** - The seed mix suggested for revegetation contains plants native to the area and compatible with the plant and animal species of the permit area.

**Federal and Utah Laws or Regulations** - The seed mix purchased to revegetate the degassification well sites will contain no poisonous or noxious plant (see Section 234.200). No species will be introduced in the area without being approved by the Division.

#### **353.300 Vegetative Exception**

Dugout Canyon does not require vegetative exception at this time.

#### **353.400 Cropland**

The permit area contains no land designated as cropland.

#### **354 Revegetative: Timing**

Dugout Canyon will follow the recommended guidelines for revegetation and planting during the first normal period for favorable planting conditions after replacement of the topsoil. In Utah the planting period is usually Fall due to the precipitation events.

#### **355 Revegetation: Mulching and Other Soil Stabilizing Practices**

Mulch and/or other soil stabilizing practices (roughing, etc.) will be used on all areas that have been regraded and covered by topsoil (Section 341.200). Dugout Canyon Mine will exercise care to guard against erosion during and after application of topsoil.

### **356 Revegetation: Standards for Success**

#### **356.100 Success of Revegetation**

The success of revegetation will be judged on the effectiveness of the vegetation for postmining land use, the extent of cover on each degassification well site compared to their respective reference areas.

**Sampling Techniques** - Dugout Canyon will comply with the standards for success, statistically valid sampling techniques for measuring success, and the approved methods outline in the Division's "Vegetation Information Guidelines, Appendix A" for sampling.

The sampling methods to be used during reclamation will be specific to the requirements at the time of reclamation. Nonetheless, according to the currently approved UDOGM guidelines, these sampling methods would be used: sample adequacy, cover (line interception), density (belt transects or plots) and productivity (clipping ~~and/or NRCS estimation~~). The Jaccard's Community Coefficient will be used to calculate acceptable plant similarity and diversity.

**Standards for Success** - The standards for success will include criteria representative of undisturbed lands in the area of the degas wells as means to evaluate ground cover, production and stocking of the reclaimed site.

#### **356.200 Standards for Success**

Standards of success will be applied in accordance with the approved postmining land use as described in this section.

**Grazing Land and Pasture Land** - The ground cover and production of living plants on the revegetated area will be at least equal to the reference area.

**Cropland** - There is no area designated as cropland within the degassification well sites.

**Fish and Wildlife Habitat** - The postmining land use for the degas well sites will be grazing.

**Industrial, Commercial or Residential** - The postmining land use for the permit area is not designated for industrial, commercial, or residential use.

**Previously Disturbed Areas** - Site G-1 has been previously disturbed. Sites G-2 and G-3 have not been previously disturbed. Standards of success for all sites will be applied in accordance with the postmining land use of grazing as described in this section.

#### **356.300 Siltation Structures**

Siltation structures will be maintained until the disturbed areas have been stabilized and revegetated. For additional details on siltation structures, see Sections 542 and 763 of this amendment.

#### **356.400 Removal of Siltation Structures**

The land on which siltation structures are located will be revegetated in accordance with the reclamation plan discussed in Section 353 and 357. Refer to Section 763 for additional information pertaining to the removal of siltation structures.

#### **357 Revegetation: Extended Responsibility Period**

Dugout Canyon will be responsible for the success of revegetation for a period of 10 years following seeding of the reclaimed area or upon Division bond release.

### **357.100 Extended Period Begins**

The period of extended responsibility will begin after disturbed areas have been reseeded.

### **357.200 Vegetation Parameters**

Vegetation parameters will equal or exceed the approved success standard during the last 2 years of the responsibility period. The success standards are outline in Section 356 of this application.

### **357.300 Husbandry Practices**

The use of husbandry practices are not being requested by Dugout Canyon for the degas well sites.

## **358 Protection of Fish, Wildlife, and Related Environmental Values**

Dugout Canyon will minimize disturbances and adverse impacts on wildlife and their related environments as outline in Section 333 of the approved M&RP and Section 342 of this submittal. See Chapter 7, Section 731.100 of the approved M&RP for methods to protect water sources in the area.

### **358.100 Existence of Endangered or Threatened Species**

The well sites will not be constructed or operated where they might jeopardize the existence of any endangered or threatened species. Refer to Section 322.200 and Attachments 3-1, 3-2 and 3-3 for additional information pertaining to threatened, endangered, and sensitive species.

State or federally listed endangered or threatened species will be reported to the Division upon its discovery.

**358.200 Bald and Golden Eagles**

Dugout Canyon understands that there is no permission implied by these regulations for taking of bald or golden eagles, their nests, or eggs. If found, nests will be reported to the Division.

**358.300 Taking of Endangered or Threatened Species**

Dugout Canyon understands that there is no permission implied by these regulations for taking of endangered or threatened species, their nests, or eggs.

**358.400 Replacement of Wetland or Riparian Vegetation**

The sites contain no wetland or riparian vegetation.

**358.500 Manmade Wildlife Protection Measure**

**Electric Power Lines** - No utilities will exist at the well sites.

**Potential Barriers** - No potential barriers will exist at any of the well sites, except for the perimeter fence. No ponds exist at the well sites. Refer to Sections 231.100 and 242 for information pertaining to the mud pit.

Canyon Fuel Company, LLC  
Dugout Canyon Mine

Methane Degassification Amendment  
August 28, 2003

**CHAPTER 2**  
**SOILS**

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<b>Attachment 2-1</b>	Soil Inventory and Assessment
<b>Attachment 2-2</b>	Topsoil Calculations

## **210 INTRODUCTION**

This chapter and associated attachments address the pertinent data required for the addition of the degassification well sites for the Dugout Canyon Mine. Only those sections of the Division regulations that apply to the well sites have been addressed. The remainder of the regulations have already been addressed in the existing M&RP. The M&RP and this document contain pertinent information relating to the identification, management, and reclamation activities associated with the soil resources.

## **220 ENVIRONMENTAL DESCRIPTION**

The well sites range in elevation from approximately 8100 to 8400 feet. The well sites are located in the Pace Canyon area of the Book Cliffs. General vegetation includes sagebrush, serviceberry, aspen, Douglas-fir, and snowberry.

### **221 Prime Farmland Investigation**

Due to limiting terrain, lack of water for irrigation and no evidence of past cultivation of the sites, it is concluded that no prime farmland exists within the area of the well site disturbance.

### **222 Soil Survey**

#### **222.100 Soils Map**

The soils have been mapped as part of the Soil Survey of the Carbon Area, Utah by the Soil Conservation Service (1988), at an Order III intensity level.

A description of the soils is included in Appendix 2-2 of the approved M&RP and in Attachment 2-1, which includes a report by Dan Larsen, Soil Scientist, entitled "Soil Inventory and Assessment Six Methane Degassification Borehole Sites".

### 222.200 Soil Identification

<u>Well No.</u>	<u>Soil Map Unit</u>	<u>Soil Components</u>
G-1	62/88	Midfork-Comodore complex, Rabbitex-Datino Varient
G-2	7	Brycan, Beje-Trag complex, 3-30% slopes
G-3	7	Beje-Trag complex, 3-30% slopes

### 222.300 Soil Description

Refer to Attachment 2-1 of the submittal for soil descriptions.

### 222.400 Soil Productivity

The depth of topsoil at each site was measured to determine the amount of growth medium available for reclamation. The following table lists each well site and the approximate amount of growth medium available.

**TABLE 2-1**  
**Topsoil Volumes**

<b>Well No.</b>	<b>Cubic Yards of Material</b>
G-1	415
G-2	3,104
G-3	1,182

Figure 5-1 through Figure 5-12 show the layout and approximate size of each well pad. Topsoil volume calculations can be found in Attachment 2-2.

Estimated topsoil salvage from the G-1 well site will average about 7". This site on a ridge top has previously been disturbed for exploration drilling. The site has pockets of fractured sandstone bedrock at the surface and stony subsoils, which are the limiting factors in the quantity of salvageable topsoil. The average topsoil depth at well site G-2 is 30". The average topsoil thickness for well site G-3 is 10". However, enough soil will be stripped to allow 12" of soil to be placed during reclamation. Thus some subsoils will be stripped with the topsoil to generate the required volume. Available topsoil at each site will be salvaged and stockpiled.

### **223 Soil Characterization**

The topsoil evaluation described in this chapter was performed by Daniel M. Larsen, Professional Soil Scientist in accordance with the standards of the National Cooperative Soil Survey.

### **224 Substitute Topsoil**

Dugout Canyon does not plan to use substitute topsoil as growth media except as described in Section 222.400.

## **230 OPERATION PLAN**

### **231 General Requirements**

#### **231.100 Removing and Storing Topsoil Methods**

The topsoil will be removed, stockpiled and protected with a berm and/or silt fence. A qualified person will be on site during soil salvage to monitor and supervise the operation for the purpose of maximizing salvage volumes.

After the topsoil is removed, the mud pit will be excavated and the soils from the mud pit excavation will be stored immediately adjacent to the mud pit. Mud pit excavation of subsoil will be approximately 97 CY at each well site. However at Well G-1, a portable container for drilling fluids will be used if necessary, should there not be sufficient subsoil depth to excavate a mud pit.

Topsoil beneath the topsoil stockpiles will not be removed. Ribbon or a marking fabric will be placed on top of the topsoil prior to placement of the topsoil from the well pad area.

The approximate volume of subsoil to be salvaged and used to create berms around the perimeter of the well site including the topsoil stockpile perimeter is: G-1 - 161 CY; G-2 - 254 CY and G-3 - 208 CY.

#### **231.200 Suitability of Topsoil Substitutes/Supplements**

See Section 224.

### **231.300 Testing of Topsoil Handling and Reclamation Procedures Regarding Revegetation**

Dugout will exercise care to guard against erosion during and after application of topsoil and will employ the necessary measures to ensure the stability on graded slopes. Erosion control measures will include silt fences, berms, seeding, straw bales, soil roughening, and mulching of the soils.

Topsoil will be redistributed and the original soil surface beneath the topsoil stockpile will be roughened as presented in Section 242.100 and seeded with the seed mix described in Chapter 3, Section 352.

Methods used to evaluate success of revegetation and stabilization are discussed in Chapter 3, Section 356.

### **231.400 Construction, Modification, Use, and Maintenance of Topsoil Storage Pile**

Topsoil removed from the drill pad sites will be stockpiled on the site. The estimated volumes of topsoil stockpile for each site are shown in Table 2-1. The stockpiles will be sized as shown in Table 2-2.

The slopes of the stockpile will be 1H:1V or approximately 45°. Soils in these areas generally have an angle of repose greater than 50 degrees, making a stockpile with 1:1 slopes feasible. The steeper slope also help minimize the area to be disturbed.

**TABLE 2-2**  
**Topsoil Stockpile Dimensions\***

<b>Well No.</b>	<b>Length (ft)</b>	<b>Width (ft)</b>	<b>Height (ft)</b>
G-1	55	35	16
G-2	156	50	20
G-3	70	60	17

\* These are approximate dimensions of the topsoil stockpile and construction dimensions may vary.

See Section 234.200 for detailed information on the topsoil stockpile(s).

### **232 Topsoil and Subsoil Removal**

#### **232.100 Topsoil Removal and Segregation**

All topsoil will be removed as a single layer with no segregation. Topsoil will be removed using a dozer and/or loader. Refer to Section 231.100 for additional details.

#### **232.200 Poor Topsoil**

No poor soils exist at the well sites see Attachment 2-1.

#### **232.300 Thin Topsoil**

Not applicable see Attachment 2-1.

#### **232.400 Minor Disturbances Not Requiring Topsoil Removal**

Topsoil will not be removed along the fence line at the wells sites.

### **232.500 Subsoil Segregation**

The B and C soil horizons will not be removed. Any small quantity of subsoil removed with the topsoil will not be segregated.

### **232.600 Timing**

Topsoil removal will take place after all vegetation that could interfere with salvaging the topsoil has been grubbed. The grubbed vegetation will be hauled offsite for disposal, either at a licensed landfill or to a location on private land, as dictated by the landowner.

### **232.700 Topsoil and Subsoil Removal Under Adverse Conditions**

The topsoil will be removed first and stockpiled and the remaining soil horizons will be left in place, except where natural conditions render removal operations hazardous or detrimental to soils outside the disturbed area then topsoil will not be removed.

**Conventional Machines** - In locations where steep grades, adverse terrains, severe rockiness, limited depth of soils, or other adverse conditions exist that render soil removal activities using conventional machines hazardous, soils will not be salvaged and stockpiled. Such conditions are not likely to occur in these areas.

**Substitute Topsoil** - Importing of substitute topsoil is not anticipated (Section 224).

### **233 Topsoil Substitutes and Supplements**

#### **233.100 Overburden Materials Supplementing and/or Replacing Topsoil**

No overburden material will be used.

#### **233.200 Suitability of Topsoil Substitutes and Supplements**

No substitute topsoil is planned.

#### **233.300 Physical and Chemical Analysis**

See Section 243.

#### **233.400 Testing of Substitute Topsoil**

No substitute topsoil is planned.

### **234 Topsoil Storage**

#### **234.100 Topsoil Stockpiling**

Topsoil will be stockpiled for later use in reclamation operations.

#### **234.200 Topsoil Stockpile**

**Stable Stockpile Site** - Stockpiled material will be placed on a stable site.

**Protection from Contaminants and Compaction** - To protect the topsoil from contaminants and unnecessary compaction that could interfere with vegetation, the stockpile will be isolated from the

main surface area by a berm and/or silt fence. A sign designating "topsoil" will be installed on the stockpile.

The topsoil stockpile will be constructed in such a manner as to allow access for repair of the pile surfaces and diversion structures.

**Wind and Water Erosion Protection** - The topsoil stockpile will be protected from water erosion by berms, which trap sediment runoff from the stockpile. The berms have been designed to completely contain the 10-year 24-hour storm event (see Attachment 7-1). The stockpile will be surface pitted and/or roughened and revegetated using the grass seeds listed in Table 3-2 to prevent wind erosion.

**Topsoil Redistribution** - Stockpile soil will not be moved until redistribution during contemporaneous or final reclamation operations unless approved by the Division.

#### **234.300 Topsoil Stockpile Relocation**

Stockpiled soil in jeopardy of being detrimentally affected in terms of its quantity and quality by drilling operations may be temporarily redistributed or relocated on approval by the Division and modification of this M&RP.

### **240 RECLAMATION PLAN**

#### **241 General Information**

Reclamation of the degassification sites (topsoil redistribution, amendments, and stabilization) is discussed in Sections 242, 243, and 244 respectively.

## 242 Soil Redistribution

### 242.100 Soil Redistribution Practices

The topsoil will be placed after recontouring of the site has occurred. Topsoil will be handled when they are loose or in a friable condition. The moisture content will be visually monitored and water will be added as needed to enhance the soil's condition for handling. The approximate amount of topsoil available for each site is shown in Table 2-1. The reclamation time line can be found on Figure 5-15.

The topsoil will be distributed in two phases, the first phase will be the contemporaneous reclamation of a portion of the pad area used during well construction (see Figures 5-4, 5-8 and 5-12). During contemporaneous reclamation topsoil from the stockpile will be distributed on each site in the depths shown in Table 2-3.

Final reclamation will occur after venting of the methane gas is complete, venting equipment has been removed and the well has been plugged. The topsoil stockpile storage area and access road will be reclaimed during this final phase. Refer to Section 341 for additional information.

**Soil Thickness** - The topsoil will be distributed during contemporaneous and final reclamation in the thickness shown in Table 2-3.

**TABLE 2-3**

**Approximate Topsoil Distribution Thickness**

<b>Well Site No.</b>	<b>Topsoil Thickness (Inches)</b>
G-1	7
G-2	30
G-3	12

**Compaction** - Prior to the application of topsoil, compacted subsoils will be roughened or loosened for a depth of 18 to 24 inches. To prevent compaction of topsoil, soil moving equipment will refrain from unnecessary operation over spread topsoil. The topsoil will be in a loosened condition prior to seeding.

Following the drying of the mud pit materials, the dirt excavated to create the mud pit will be mixed with the drill cutting and returned to the pit to prevent a boundary of hard material from forming in the mud pit area that would hamper root penetration and then compacted to minimize settling.

**Erosion** - Care will be exercised to ensure the stability of topsoil on graded slopes to guard against erosion during and after topsoil application. Post reclamation (contemporaneous and final) erosion control measures will be surface roughing, mulching and seeding.

#### **242.200 Regrading**

The area will be graded to the approximate original topographic configuration.

#### **242.300 Topsoil Redistribution on Impoundments and Roads**

The mud pits will be dismantled during contemporaneous reclamation and reclaimed with the portion of the well pad area not remaining during the well operational phase (see Figures 5-4, 5-8, and 5-12). The roads existing prior to starting the drilling program will not be reclaimed. Access roads built to allow entrance to the drilling pads will be reclaimed and will receive topsoil in the same depth as their corresponding pad areas when methane venting is complete.

#### **243 Soil Nutrients and Amendments**

The soils will be analyzed directly following salvage to determine if amendments are needed. Testing of the topsoil will be done according to Table 6 of the Division's Topsoil and Overburden Guidelines. The topsoil will be tested at a minimum for the following parameters: pH, electrical

conductivity, total carbon, SAR, water holding capacity, plant available nitrogen, and phosphorus. Results of these analyses will be incorporated into Attachment 2-2.

## **244 Soil Stabilization**

### **244.100 Protection and Stabilization of Surface Area**

All reclaimed areas will be stabilized to control erosion by application of mulch, tackifier, and roughening of the surface. The areas will be graded to the approximately original topographic configuration. Seeding will be accomplished with the application of seeds and mulch with a long fiber tackifier. Methods of protection and stabilization are further discussed in Chapter 3, Section 341.

### **244.200 Mulch Application**

Mulch/tackifier will be applied to stabilize the soil on all areas that have been regraded and covered with growth media. For further discussion of revegetation practices to be utilized, see Chapter 3, Section 341.

### **244.300 Rills and Gullies**

**Postmining Land Use and Revegetation** - Rills and gullies that are approximately nine (9) inches in depth and disrupt the postmining land use or reestablishment of vegetative cover will be regraded and seeded.

**Water Quality** - There are no streams immediately adjacent to the well sites.

## **250 PERFORMANCE STANDARDS**

### **251 Topsoil, Subsoil, and Topsoil Supplements Management**

All topsoil, subsoil, and topsoil supplements will be managed as outlined in Sections 230 and 240.

### **252 Stockpiled Topsoil and Subsoil**

All stockpiled topsoil and subsoil will be managed according to plans outlined in Sections 230 and 240.

Canyon Fuel Company, LLC  
Dugout Canyon Mine

Methane Degassification Amendment  
August 28, 2003

**Add to the back of the existing information**

**ATTACHMENT 2-2  
TOPSOIL CALCULATIONS**

## **EarthFax Engineering Inc.**

**7324 South Union Park Avenue Suite 100, Midvale, Utah 84047**

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**•Layne D. Jensen, P.E.•**

### EDUCATION

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MS, ENVIRONMENTAL ENGINEERING <i>Stanford University</i>	1995 <i>Palo Alto, California</i>
BS (CUM LAUDE), MINING ENGINEERING <i>University of Utah</i>	1993 <i>Salt Lake City, Utah</i>

### EXPERIENCE

---

ENVIRONMENTAL ENGINEER <i>EarthFax Engineering, Inc.</i>	1995-PRESENT <i>Salt Lake City, Utah</i>
-------------------------------------------------------------	---------------------------------------------

Provided construction inspection for reclamation work at four mine sites. Designed sediment pond embankments. Provided inspection for reconstruction and expansion of an existing sediment pond embankment. Perform annual inspections of sediment pond embankments and refuse pile slopes. Designed and demonstrated effectiveness of erosion control methods at reclamation sites. Designed and inspected installation of channels using erosion control matting. Worked with regulatory issues regarding reclamation and sediment control issues. Designed surface runoff and sediment control facilities (diversion ditches, culverts, and ponds) for proposed mines and currently operating coal mines in Utah. Designed reclamation topography and channels for inactive underground coal mines and proposed underground coal mines in Utah. Designed a pumping system to dewater a storm water detention pond at a Northern Utah military facility.

Prepared and presented groundwater contaminant transport models for a Northern Utah oil refinery and aerospace facility. Collected groundwater and soil samples at a Northern Utah oil refinery. Performed statistical analysis on groundwater sampling results for a Northern Utah oil refinery

Prepared several drinking-water source protection plans for water-supply wells. The purpose of the plans was to provide guidance for long-term protection of water quality. Evaluated hydrogeologic conditions, potential sources of contamination, and travel times for contaminants.

Provided construction inspection for a water diversion project. Worked as a quality assurance officer on a stabilization project for a Northern Utah oil refinery. Worked as owner's representative at a petroleum pipeline spill site and for construction of a remediation system.

Assisted in the preparation of a Surface Water Pollution Prevention Plan for a Superfund site in southern Utah. Assisted in conducting an environmental due diligence for three Utah coal mines and related facilities. Assisted in preparation of an erosion control plan for a Northern Utah Aerospace facility. Prepared hydrology and engineering sections of permit applications for Utah coal mines. Prepared an air quality permit application for a Utah coal mine. Coordinated air dispersion modeling for Utah and Colorado coal mines. Prepared Phase I Environmental Assessments.

ENVIRONMENTAL ENGINEER 1994-1995  
*DMK Environmental Engineering, Inc.* Salt Lake City, Utah

Prepared air quality permit applications for industrial facilities ranging from sand and gravel operations to large painting operations. Prepared emission inventories for sand and gravel pits, concrete batch plants, and asphalt batch plants. Performed engineering reviews of air quality permit applications for the Utah Division of Air Quality. Prepared potential to emit calculations and performed a regulations review for inclusion in a Title V permit application.

BLASTING TECHNICIAN 1994  
*Sandex, Inc.* Salt Lake City, Utah

Prepared blasting patterns at the Barneys Canyon Mine. Supervised blasting crew.

MINING ENGINEER 1993-1994  
*Barneys Canyon Mine* Salt Lake City, Utah

Designed dumps for overburden material. Maintained database with production and compliance information. Monitored groundwater in the vicinity of the pit. Assisted surveyors.

RESEARCH ASSISTANT 1992-1993  
*University of Utah Department of Mining Engineering* Salt Lake City, Utah

Performed stream sampling to test for metals in drinking water. Setup laboratory to test water quality.

MINING ENGINEERING ASSISTANT 1992  
*Bingham Canyon Mine* Salt Lake City, Utah

Prepared map indicating areas of seepage into the pit and identified the related geologic structure. Maintained database on groundwater potentiometric surface location in the vicinity of the pit. Monitored and reported on the effectiveness of the slope dewatering program.

MINING ENGINEERING ASSISTANT 1991  
*Bailey Mine* Washington, Pennsylvania

Assisted mine engineers with ventilation plans and surveying in an underground coal mine.

#### CERTIFICATIONS AND REGISTRATIONS

Registered Professional Engineer (Utah and Idaho)

Canyon Fuel Company, LLC  
Dugout Canyon Mine

Methane Degassification Amendment  
August 28, 2003

**CHAPTER 3**  
**BIOLOGY**

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### **310 INTRODUCTION**

This chapter presents a description of the biological resources found on the Dugout Canyon degas well site areas.

#### **311 Vegetative, Fish and Wildlife Resources**

Vegetative, fish, and wildlife resource conditions in and adjacent to the proposed degassification wells are discussed in Section 320 of this submittal and the approved M&RP.

#### **312 Potential Impacts to Vegetative, Fish, and Wildlife Resources**

Potential impacts to vegetative, fish, and wildlife resources and the associated mitigation plan is presented in Sections 330 and 340 of this chapter.

#### **313 Description of Reclamation Plan**

The reclamation plan used to restore the vegetative, fish, and wildlife resources to a condition suitable for the post mining land use is presented in Section 340.

### **320 ENVIRONMENTAL DESCRIPTION**

#### **321 Vegetation Information**

This section and the approved M&RP contain the environmental descriptions of the vegetation for the permit and adjacent areas.

**321.100 Plant Communities Within the Proposed Permit Area**

During June 2003, the degassification well sites were surveyed by Patrick Collins, Mt. Nebo Scientific). The report and survey for the areas are included in Attachment 3-1.

**321.200 Land Productivity Prior to Mining**

Productivity of the well site lands prior to mining are shown in Table 3-1.

**TABLE 3-1  
Land Productivity**

<b>Well No.</b>	<b>Productivity (lbs.) Per Acre</b>
G-1 (Previously Disturbed)	300
G-2	1,500
G-3	1,500
Aspen, Maple, Douglas Fir Reference Area	
Sagebrush, Snowberry, Grass Reference Area	

### **322 Fish and Wildlife Information**

Fish and wildlife information associated with the degas wells is provided in this chapter. A summary of the fish and wildlife resource information for the permit and adjacent areas is contained in Sections 322.100 through 322.200 of the approved M&RP.

#### **322.100 Level of Detail**

The scope and level of detail within the "Methane Degassification Amendment" are sufficient to design the protection and enhancement plan for wildlife and fish associated with the degas wells. Additional information pertaining to fish and wildlife in the permit area is located in the M&RP.

#### **322.200 Site-Specific Resource Information**

**Raptors** - An aerial raptor nest survey was done of the area by the Utah Division of Wildlife Resource (DWR, Chris Colt, Leroy Mead) and CFC personnel in May of 2003, refer to Attachment 3-3.

No raptor nests were recorded during the survey in the area (portions of N1/2SE1/4NW1/4 and N1/2SW1/4NE1/4 of Section 24; a portions of N1/2SW1/4NW1/4 Section 19, Township 13 South, Range 13 East) of the degas wells. Refer to Figure 1-1 for mapped well locations.

A raptor survey will be conducted of the well site areas, each year that the wells are in operation.

**Bats** - No known open mine shafts, caves, adits or other man made structures that might provide habitats for bats are known to exist in the degas project area. The sites are open and the lack of a food source would force the bats to seek habitat and nourishment elsewhere.

**Mexican Spotted Owl** - In the Summer of 2003, a calling point survey was conducted in the degas well area by EIS Environmental and Engineering Consulting. The survey report concluded that “within the project area, a thorough search did not reveal the presence of any Mexican spotted owls”. The report is included in Attachment 3-2.

**Threatened and Endangered Plant and Wildlife Species** - There are no known federally or state listed threatened and endangered plant and wildlife species within the sites planned for degassification wells.

There are no known groundwater or surface water flows to the Colorado or Green Rivers with potential for impact by the drilling of the degas wells. Potential adverse affects to the four Colorado River endangered fish species (refer to table below) would not be likely since there is no direct route to the Colorado River or Green River from the proposed well locations. Per the Windy Gap Process (referenced by personal communication Jerriann Ernstsens, 8/19/03) consumption estimates for the degas wells: evaporation from ventilation - zero, drill holes will not intersect the coal seam being mined, therefore no access to mine ventilation until after area is sealed; coal preparation - zero, no coal preparation at degas sites (see Sections 522 and 523); sediment pond evaporation - zero, no sediment pond at degas sites (see Section 732.200); subsidence effects on springs - zero, no anticipated subsidence at degas sites (see Section 525); alluvial aquifer abstractions into mines - zero, no alluvial aquifer abstractions associated with degas drill holes (see Sections 513.500 and 600); postmining inflow to workings - zero, no workings for postmining inflow associated with degas wells (see Sections 513.500 and 600); coal moisture loss - zero, no coal therefore no moisture loss (see Sections 522 and 523); direct diversion - zero, no direct diversions associated with degas wells (see Sections 522 and 523). Mitigation will not be required since the estimated loss for the construction and reclamation of the degas holes is zero acre feet per year.

**Federal and State Listed, Threatened, Endangered and Candidate Species  
Plants and Wildlife  
Carbon County, Utah  
October 2002**

Common Name	Scientific Name	Status	Habitat Present*
<b>Plants</b>			
Uinta Basin Hookless Cactus	<i>Sclerocactus glaucus</i>	T	No habitat available
Graham Beardtongue	<i>Penstemon grahamii</i>	C	No habitat available
<b>Fish</b>			
Humpback Chub	<i>Gila cypha</i>	E	No habitat available
Roundtail Chub**	<i>Gila robusta</i>	T	No habitat available
Bonytail	<i>Gila elegans</i>	E	No habitat available
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	E	No habitat available
Razorback Sucker	<i>Xyrauchen texanus</i>	E	No habitat available
<b>Birds</b>			
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	No habitat available, See Attachment 3-3
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	C	No habitat available
Peregrine Falcon**	<i>Falco Peregrinus</i>	D	See definition of 'D' below
Ferruginous Hawk**	<i>Buteo Regalis</i>	T	No habitat available
Southwestern Willow Flycatcher**	<i>Empidonax traillii extimus</i>	E	No habitat available
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T	See Attachment 3-2
<b>Mammals</b>			
Black-footed Ferret	<i>Mustela nigripes</i>	EX	No habitat available

\* Habitat availability in Carbon County/Dugout Mine/Degas Well Sites.

\*\* Utah State Listed Species - Information verified with Bill Bates, DWR (personal communication 7/17/03)

- E = A taxon that is listed by the U.S. Fish and Wildlife Service as "endangered" with the possibility of worldwide extinction.
- T = A taxon that is listed by the U.S. Fish and Wildlife Service as "threatened" with becoming endangered.
- C = A taxon for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threats to justify it being a "candidate" for listing as and endangered or threatened.
- D = In the process of being delisted, process began in 2000.

Source: Utah Division of Wildlife Resources data base - created 10/24/02

### **322.300 Fish and Wildlife Service Review**

If requested, Dugout Canyon authorizes the release of information pertaining to Section 322 and 333 to the U. S. Fish and Wildlife Service Regional and Field Office for their review.

### **323 Maps and Aerial Photographs**

Location of the well sites can be seen in Figure 1-1 of this submittal.

### **323.100 Location and Boundary of Proposed Reference Area**

Reference areas for the degassification wells were established during the vegetative study conducted in the Summer of 2003. Well sites G-2 and G-3 will be compared to the Sagebrush/Snowberry/Grass reference area and G-1 to the Aspen/Maple/Douglas Fir reference area. Refer to Attachment 3-1 and Figure 3-1 for the location of the reference areas.

### **323.200 Elevation and Locations of Monitoring Stations**

Refer to Section 323.200 of the approved M&RP.

### **323.300 Facilities for Protection and Enhancement**

Section 333.300 and 358.500 of the approved M&RP contain additional discussion pertaining to protective measures to be taken by Dugout Canyon on behalf of wildlife.

### **323.400 Vegetation Type and Plant Communities**

Vegetative types and plant communities are outlined in the vegetative report in Attachment 3-1. Figure 3-2 gives details of the vegetation types located adjacent to the well sites.

## **330 OPERATION PLAN**

### **331 Measures Taken to Disturb the Smallest Particle Area**

The well sites will be sized to disturb the smallest acreage possible and still meet the requirements for the drilling equipment. The drainage control required will be built to satisfy the environmental requirements.

### **332 Description of Anticipated Impacts of Subsidence**

Refer to Section 525.

### **333 Plan to Minimize Disturbances and Adverse Impacts**

General control and mitigation measures addressing potential related biological impacts will include the following:

- Minimizing the total area of disturbance,
- Design, construction, and operation of the well sites to minimize impacts
- Exclusion of wildlife from potentially hazardous areas, and
- Reclamation of disturbed areas when they are no longer needed.

All water associated with the drilling of these wells will be appropriated and hauled to the sites by a licensed contractor. Since the drilling of degas wells does not involve the mining of coal, the USWFS consumption requirements for underground operations do not apply (i.e., evaporation from ventilation, coal preparation, sediment pond evaporation, subsidence of springs, alluvial aquifer abstractions into the mine, postmining inflow to workings, coal moisture loss, direct diversions).

#### **333.100 Minimize Disturbance to Endangered or Threatened Species**

Dugout Canyon will apply all methods necessary to minimize disturbances or any adverse effects to threatened or endangered species. See Section 322.200.

#### **333.200 Species and Habitats**

All species and habitats within the permit area will be protected to the best of Dugout Canyon's ability.

### **333.300 Protective Measures**

Refer to Section 333.300 of the approved M&RP.

## **340 RECLAMATION PLAN**

### **341 Revegetation**

Revegetation of the sites will occur in two phases. The first phase is to redistribute topsoil and seed the well area not needed for access and operation of the gas exhaust blower. The second phase will consist of plugging the well and distributing the remaining topsoil and seeding on the remaining pad area. Refer to Section 242.100 for additional detail.

The short-term goal of this revegetation plan is the immediate stabilization of the disturbed sites through erosion control. This objective will be achieved through controlled grading practices, proper seedbed preparation to encourage rapid plant establishment, inclusion of rapidly establishing species in the seed mixture to be planted, and mulch application.

The long-term goals are to establish useful, and productive range. These goals will be attained through the selection and placement of desirable and productive plant species and a commitment to monitor and maintain revegetated areas throughout the bond liability period.

The well sites will be fenced to discourage wildlife and livestock from grazing the reclaimed areas until bond release.

### **341.100 Schedule and Timetable**

The reclamation timetable is shown in Figure 5-15 of this submittal and the reclamation monitoring schedule is found in Chapter 3, Table 3-3 of the approved M&RP.

### **341.200 Descriptions**

**Species and Amounts of Seed** - The well sites will be planted with the seed mix listed on Table 3-2. The seed mix will be used in both contemporaneous and final reclamation phases. The seed will be incorporated with a small amount of wood fiber mulch and applied by hydroseeding equipment. Refer to Section 234.200 for topsoil stockpile seeding description.

**Methods Used for Planting and Seeding** - The degassification sites will be graded to final contour, then ripped to relieve compaction. The depth of ripping will be from 18 to 24 inches. Following ripping, topsoil will be applied to the ripped surface and left in a roughened state.

**Mulching Techniques** - Wood fiber mulch will be applied on top of the seed with hydroseeding equipment at the rate of 2,000 pounds per acre and anchored with a tackifier.

**Irrigation, Pest, and Disease Control** - No irrigation is planned and pesticides will not be used unless previously approved by the Division.

**Measures Proposed for Revegetation Success** - Refer to Section 356.

### **341.300 Greenhouse Studies, Field Trials or Other Equivalent Studies**

Refer to the Section 341.300 of the approved M&RP.

## **342 Fish and Wildlife**

### **342.100 Enhancement Measures**

Post bond release enhancement measure will include the establishment of vegetation for wildlife food, cover, and the break up of large blocks of monoculture to diversify habitat.

### **342.200 Plants Used for Wildlife Habitat**

**Nutritional Value** - The nutritional value will be consistent with that of vegetation in the surrounding areas.

**Cover** - Cover will be comparable to the cover on the associated reference area.

### **342.300 Cropland**

Cropland is not a postmining land use.

### **342.400 Residential, Public Service, and Industrial Land Use**

No residential, industrial or public service use is planned.

## **350 PERFORMANCE STANDARDS**

### **351 General Requirements**

Dugout Canyon commits to conduct all operations in accordance with the plans submitted in Sections R645-301-330 through R645-301-340 of the permit application.

### **352 Contemporaneous Reclamation**

Reclamation activities prior to final reclamation will to the extent feasible, be performed contemporaneously. Contemporaneous reclamation will be performed at the well sites following construction of the wells. Refer to Section 341 for additional details.

### **353 Revegetation: General Requirements**

A vegetative cover will be established on all reclaimed areas to allow for the designated postmining land use of grazing. Refer to Section 411 for additional information.

#### **353.100 Vegetative Cover**

The seed mix proposed for revegetation is intended to provide vegetative cover that will be diverse, effective, and permanent. The seed mixture was selected with respect to the climate, potential seedbed quality, erosion control, drought tolerance, and the mixture's ability for quick establishment and spreading.

**Native Species** - The reclamation vegetation mixture will be comprised of species indigenous to the area and capable of achieving the postmining land use. Diversity of species should allow utilization of plants by wildlife and domestic livestock. The recommended seed mix is comprised of native species.

**Extent of Cover** - The vegetative cover will be at least equal in extent to the cover at the designated reference areas.

**Stabilizing** - The vegetative cover mixture is capable of stabilizing the soil surfaces from erosion.

**Table 3-2**  
**Reclamation Seed Mix**

<u>SPECIES</u>	<u># pls/acre</u>	<u># pls/sq. ft.**</u>
<b>Grasses, Forbs, and Shrubs</b>		
Kentucky Bluegrass (1,390,000 seeds/lb)*	0.5	16
Mountain Brome (64,000 seeds/lb)*	2.0	3
Sandberg Bluegrass (1,100,000 seeds/lb)*	1.0	25
Bluebunch Wheatgrass (126,000 seeds/lb)*	4.0	12
Bottlebrush Squirreltail (192,000 seeds/lb)*	1.0	4
Rocky Mountain Penstemon (478,000 seeds/lb)*	1.0	11
Mountain Lupine (12,000 seeds/lb)*	3.0	1
Mtn. Snowberry (54,000 seeds/lb)*	4.0	5
Wyoming Big Sage (2,500,000 seeds/lb)*	<u>0.5</u>	<u>29</u>
TOTAL	17	106

\* Native Plants

\*\* Rounded nearest whole seed

### **353.200 Reestablished Plant Species**

**Compatible** - The reestablished plant species have been selected to insure their compatibility with the approved postmining use.

**Seasonal Characteristics** - The revegetation plant species will have the same growing season as the adjacent areas.

**Self-Generation** - The reestablished plants are species capable of self-generation and plant succession.

**Compatibility** - The seed mix suggested for revegetation contains plants native to the area and compatible with the plant and animal species of the permit area.

**Federal and Utah Laws or Regulations** - The seed mix purchased to revegetate the degassification well sites will contain no poisonous or noxious plant (see Section 234.200). No species will be introduced in the area without being approved by the Division.

#### **353.300 Vegetative Exception**

Dugout Canyon does not require vegetative exception at this time.

#### **353.400 Cropland**

The permit area contains no land designated as cropland.

#### **354 Revegetative: Timing**

Dugout Canyon will follow the recommended guidelines for revegetation and planting during the first normal period for favorable planting conditions after replacement of the topsoil. In Utah the planting period is usually Fall due to the precipitation events.

#### **355 Revegetation: Mulching and Other Soil Stabilizing Practices**

Mulch and/or other soil stabilizing practices (roughing, etc.) will be used on all areas that have been regraded and covered by topsoil (Section 341.200). Dugout Canyon Mine will exercise care to guard against erosion during and after application of topsoil.

### **356 Revegetation: Standards for Success**

#### **356.100 Success of Revegetation**

The success of revegetation will be judged on the effectiveness of the vegetation for postmining land use, the extent of cover on each degassification well site compared to their respective reference areas.

**Sampling Techniques** - Dugout Canyon will comply with the standards for success, statistically valid sampling techniques for measuring success, and the approved methods outline in the Division's "Vegetation Information Guidelines, Appendix A" for sampling.

The sampling methods to be used during reclamation will be specific to the requirements at the time of reclamation. Nonetheless, according to the currently approved UDOGM guidelines, these sampling methods would be used: sample adequacy, cover (line interception), density (belt transects or plots) and productivity (clipping). The Jaccard's Community Coefficient will be used to calculate acceptable plant similarity and diversity.

**Standards for Success** - The standards for success will include criteria representative of undisturbed lands in the area of the degas wells as means to evaluate ground cover, production and stocking of the reclaimed site.

#### **356.200 Standards for Success**

Standards of success will be applied in accordance with the approved postmining land use as described in this section.

**Grazing Land and Pasture Land** - The ground cover and production of living plants on the revegetated area will be at least equal to the reference area.

**Cropland** - There is no area designated as cropland within the degassification well sites.

**Fish and Wildlife Habitat** - The postmining land use for the degas well sites will be grazing.

**Industrial, Commercial or Residential** - The postmining land use for the permit area is not designated for industrial, commercial, or residential use.

**Previously Disturbed Areas** - Site G-1 has been previously disturbed. Sites G-2 and G-3 have not been previously disturbed. Standards of success for all sites will be applied in accordance with the postmining land use of grazing as described in this section.

#### **356.300 Siltation Structures**

Siltation structures will be maintained until the disturbed areas have been stabilized and revegetated. For additional details on siltation structures, see Sections 542 and 763 of this amendment.

#### **356.400 Removal of Siltation Structures**

The land on which siltation structures are located will be revegetated in accordance with the reclamation plan discussed in Section 353 and 357. Refer to Section 763 for addition information pertaining to the removal of siltation structures.

#### **357 Revegetation: Extended Responsibility Period**

Dugout Canyon will be responsible for the success of revegetation for a period of 10 years following seeding of the reclaimed area or upon Division bond release.

### **357.100 Extended Period Begins**

The period of extended responsibility will begin after disturbed areas have been reseeded.

### **357.200 Vegetation Parameters**

Vegetation parameters will equal or exceed the approved success standard during the last 2 years of the responsibility period. The success standards are outline in Section 356 of this application.

### **357.300 Husbandry Practices**

The use of husbandry practices are not being requested by Dugout Canyon for the degas well sites.

## **358 Protection of Fish, Wildlife, and Related Environmental Values**

Dugout Canyon will minimize disturbances and adverse impacts on wildlife and their related environments as outline in Section 333 of the approved M&RP and Section 342 of this submittal. See Chapter 7, Section 731.100 of the approved M&RP for methods to protect water sources in the area.

### **358.100 Existence of Endangered or Threatened Species**

The well sites will not be constructed or operated where they might jeopardize the existence of any endangered or threatened species. Refer to Section 322.200 and Attachments 3-1, 3-2 and 3-3 for additional information pertaining to threatened, endangered, and sensitive species.

State or federally listed endangered or threatened species will be reported to the Division upon its discovery.

**358.200 Bald and Golden Eagles**

Dugout Canyon understands that there is no permission implied by these regulations for taking of bald or golden eagles, their nests, or eggs. If found, nests will be reported to the Division.

**358.300 Taking of Endangered or Threatened Species**

Dugout Canyon understands that there is no permission implied by these regulations for taking of endangered or threatened species, their nests, or eggs.

**358.400 Replacement of Wetland or Riparian Vegetation**

The sites contain no wetland or riparian vegetation.

**358.500 Manmade Wildlife Protection Measure**

**Electric Power Lines** - No utilities will exist at the well sites.

**Potential Barriers** - No potential barriers will exist at any of the well sites, except for the perimeter fence. No ponds exist at the well sites. Refer to Sections 231.100 and 242 for information pertaining to the mud pit.

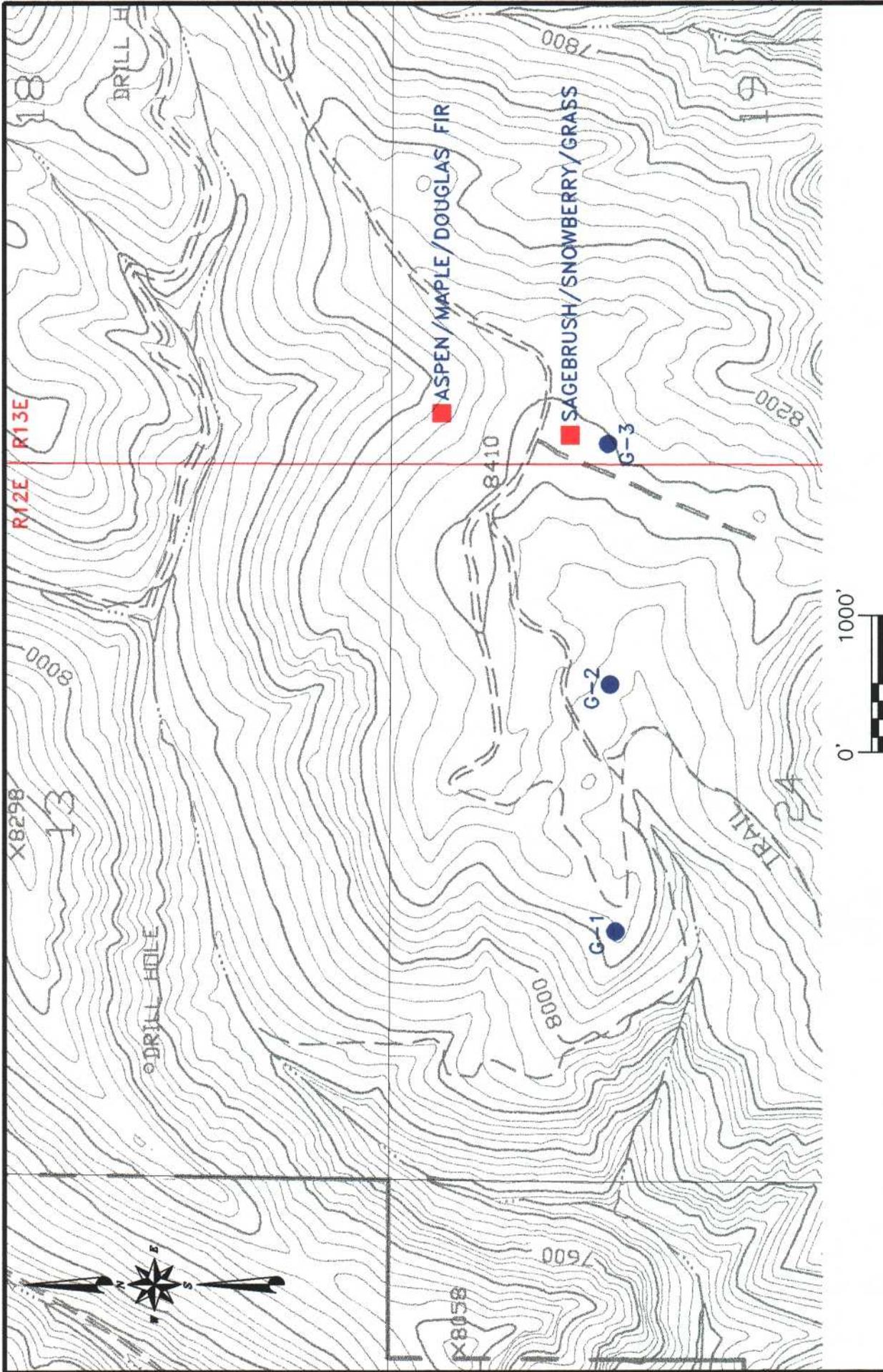


FIGURE 3-1. VEGETATION REFERENCE AREAS

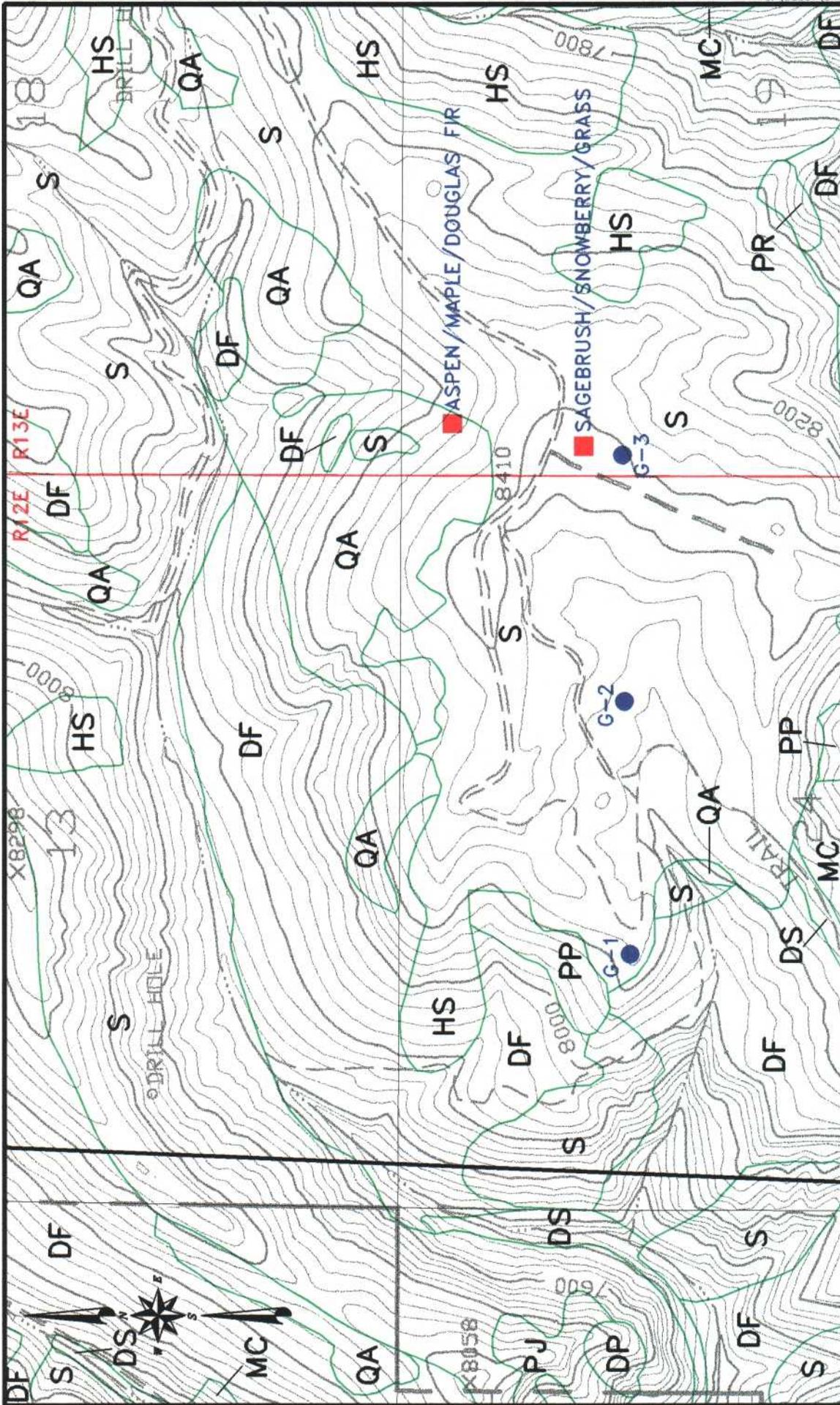


FIGURE 3-2. ADJACENT VEGETATION

FIGURE 3-2

Legend

DF	DOUGLAS FIR
DS	DECIDUOUS STREAMBANK
DP	DOUGLAS FIR
HS	HIGH SHRUBS
MC	MIXED CONIFER
QA	QUAKING ASPEN
PJ	PINYON JUNIPER
PP	PONDEROSA PINE
PR	PONDEROSA PINE
S	SAGEBRUSH

SOURCE: REPORT BY ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC., DR. STEVEN RICHARSON, 1980; AERIAL PHOTOGRAPHS; SOIL SURVEY OF CARBON AREA, UTAH AND VEGETATION REPORT, MT. NEBO SCIENTIFIC; WELL LOCATION SURVEYED BY BRUCE WARE.

THE VEGETATION COMMUNITY UNIT MAPPING ON THIS FIGURE ARE OF LESSER INTENSITY THAN THE INFORMATION PROVIDED IN THE VEGETATION REPORT PREPARED BY MT. NEBO SCIENTIFIC FOR THE INDIVIDUAL WELL SITE.

Canyon Fuel Company, LLC  
Dugout Canyon Mine

Methane Degassification Amendment  
August 28, 2003

**ATTACHMENT 3-1**  
**VEGETATION INVENTORY**

Total woody species density was estimated at 4,265 individuals per acre, and mostly comprised of snowberry, big-toothed maple, aspen and Douglas Fir (Table 24).

#### Threatened & Endangered Plant Species Survey

State databases revealed only one potential sensitive species to be located in the vicinity of the proposed disturbed borehole sites. This plant was canyon vetch (*Hedysarum occidentale* var. *canone*). Each proposed disturbed area was surveyed in the field for canyon vetch (or any other unusual or sensitive plants). This survey was done prior to recording the quantitative data used to describe the major plant communities of the study areas. In addition, more searching for sensitive species was done during quantitative sampling of the areas.

No rare, endemic, threatened, endangered or otherwise sensitive species were found in the study areas.

## DISCUSSION

As mentioned previously in this report, Reference Areas with similar environmental attributes were chosen to represent future revegetation success standards of the areas proposed for disturbance by the de-gasification borehole drill sites. In other words, once the borehole sites are reclaimed and revegetated, they will be compared to their respective Reference Areas by again recording quantitative and qualitative data of each site and comparing the results statistically.

Present state and federal regulations require the revegetated plant communities to be “diverse, effective and permanent”. Moreover, these reclaimed communities should be “capable of self-regeneration and plant succession” and be “compatible with the plant and animal species of the area”. Parameters including total living cover, woody species density and diversity will be measured and compared statistically with the Reference Areas before the mine operator is released from rehabilitation responsibility of these areas. Success of the reclaimed areas must be greater than or equal to the Reference Areas using a 90 percent statistical confidence interval (i.e. one-sided test with a 0.10 alpha error).

Prior to creating any disturbance to the plant communities that exist in the area, total living cover and woody species densities of the Reference Areas have been compared statistically with those areas proposed for disturbance. The Reference Areas were chosen in an attempt to provide fair and consistent standards for future revegetation success for those borehole areas where the plant communities are proposed to be disturbed.

For most total living cover measurement (with two exceptions) there were no statistical differences between the proposed disturbed borehole sites with their respective Reference Areas (Fig. 1). The exceptions were Borehole Sites G-1 and G4. As explained in the RESULTS section above, these borehole sites were sites that had been disturbed by previous activities such as road/pad building and logging activities. With the absence of well-developed overstory cover, the total living covers were significantly less than that of the Reference Area.

Woody species densities were significantly different in most areas (Fig. 2). This can be explained in some areas due to previous disturbance as explained in the previous paragraph. In the other areas, the differences came due to the natural variability in native plant communities. These variables and differences should be considered and reasonable guidelines sought, in order to provide future revegetation success standards by representatives from the mine and state regulators. Considerations should be made for those areas that have already been disturbed by previous activities. For example, should those areas be required to meet the standards derived from Reference Areas that have not been disturbed previously?

In choosing standards, it may be more straightforward for those areas that have never been disturbed, yet they may still differ somewhat from those areas chosen to be success standards.

Without exception, the parameter that was significantly different was woody species density. All woody species densities measured in the native undisturbed communities, whether proposed for disturbance or Reference Areas, are appropriate density standards for future success. In fact, numbers somewhat lower than those numbers may be somewhat justified, and can be decided upon by the representatives for the mine and regulatory authorities.

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**CHAPTER 4**  
**LAND USE AND AIR QUALITY**

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## **410 LAND USE**

### **411 Environmental Description**

A statement of the conditions and capabilities of the land to be affected by mining and reclamation operations follows in this section.

#### **411.100 Premining Land Use**

The area is utilized for the landowners private use, including hunting and as open range for livestock and wildlife.

#### **411.110 Land Use Map and Narrative**

Refer to the same section of the approved M&RP.

#### **411.120 Land Capability**

The major plant communities at the well sites are identified in Section 321. No cultivated lands lie within the well boundaries, due to the limiting terrain and lack of water for irrigation. Refer to Section 321.200, Table 3-1 of this submittal for forage production per acre for each well site.

The well site areas are located on the flatter mesa tops and rolling terrain. This type of terrain receives heavier pressure because of more available forage and easier movement by livestock.

#### 411.130 Land Use Description

The wells are located on land administered by Milton & Ardith Thayn Trust and zoned by Carbon County for mining and grazing (MG-1).

No industrial or municipal facilities are located on or immediately adjacent to the well sites.

#### 411.140 Cultural and Historic Resources Information

**Cultural and Historic Resource Maps** - Archaeological surveys were conducted in June 2003, of the well sites. Nothing was found that required future investigation. There are no cemeteries, public parks, or units of the National System of Trails or the Wild and Scenic Rivers System located within the well site boundaries. The report can be found in Attachment 4-1 of this submittal.

Previous research in 1980 by "AERC surveyed several sample blocks in Sections 13 and 24, T13S, R12E and Sections 18, 19 and 30 T13S, R13E. They also surveyed the access road into the Snow Mine site. One archeological site (42CB292) was located. The site was described as "Coal mine located in Pace Canyon consists of one known mine portal which has been closed. Site of historic Snow Mine in Pace Canyon which was active in 1906 but had its primary production period from 1932-1940." The site was relatively pristine at the time and still contained a standing coal loadout and foundation with depth potential. Avoidance was recommended pending further historic research. As noted the site has since been extensively modified" (Attachment 4-1, Senco-Phenix, June 24, 2003, SPUT-455, page 2).

Access to the degas holes will not impact or disturb what remains of the archeological site (42CB292). The road in the bottom of Pace Canyon passes the archeological site, but the closed portal is not visible from the road, therefore there is nothing to draw attention to the site. The loadout referenced in the survey no longer exist at the site. Access to the degas holes is as

follows (per request by Pricilla Burton, UDOGM, August 2003): Turn left (north) off US Highway 6 (eastbound) 7 miles beyond the city of Wellington onto a dirt road, proceed on dirt road 8 miles to an intersection turn left (west) and proceed 1.5 miles to locked gate, proceed onto road in the bottom of Pace Canyon travel an additional 1 mile to intersection turn left (northwest), travel 1.5 miles to intersection turn left (southwest), proceed 0.5 miles to intersection turn left (south) proceed 0.3 miles to drill site G-3. To proceed to G-2 turn north from G-3 travel 0.3 miles turn left, travel 0.25 miles to intersection turn left (south) proceed 500 feet and turn left 100 feet to drill site G-2. To proceed to G-1 turn right and travel 100 feet, turn right and travel 500 feet, turn left (west) travel 500 feet to intersection turn right, proceed 1000' to drill site G-1. All mileage/footage is approximate.

Dugout Canyon agrees to notify the Division and State Historical Preservation Office (SHPO) of previously unidentified cultural resources discovered in the course of operations. Dugout Canyon also agrees to have any such cultural resources evaluated in terms of NRHP eligibility criteria. Protection of eligible cultural resources will be in accordance with Division and SHPO requirements. Dugout Canyon will also instruct its employees that it is a violation of federal and state law to collect individual artifacts or to otherwise disturb cultural resources.

#### **411.200 Previous Mining Activity**

Dugout Canyon has no knowledge of the removal of coal or other minerals in the well site areas.

#### **412 Reclamation Plan**

##### **412.100 Postmining Land-Use Plan**

All uses of the land prior to the wells construction/operation and the capacity of the land to support prior alternate uses will remain available throughout the life of the sites.

Dugout Canyon intends the postmining land use to be livestock and wildlife grazing **and other uses as dictated by the land owner (hunting, etc.)**. Final reclamation activities will be completed in a manner to provide the lands able to parallel the premining land use.

#### **412.200 Land Owner or Surface Manager Comments**

Milton & Ardith Thayn Trust is the landowner. Canyon Fuel Company, LLC has a surface land owner agreement with the Thayne Trust for the drilling of degassification holes (Attachment 4-2). **Prior to drilling the landowner will be contacted and the requirements related to drilling as outlined in the surface land owner agreement will be met. A copy of the letter will be included in Attachment 4-2.**

#### **413 Performance Standards**

##### **413.100 Postmining Land Use**

Postmining land uses are discussed in Section 412.100. The postmining lands will be reclaimed in a timely manner and capable of supporting such uses (see Chapters, 2, 3, 5, and 7).

##### **413.200 Determining Premining Uses of Land**

Refer to Section 411.100.

##### **413.300 Criteria for Alternative Postmining Land Uses**

No alternative postmining land uses have been planned.

#### **414 Alternative Land Use**

No alternative postmining land uses have been planned.

#### **420 AIR QUALITY**

##### **421 Air Quality Standards**

Dugout Canyon activities will be conducted in compliance with the requirements of the Federal Clean Air Act and the Utah Air Conservation Rules.

##### **422 Compliance Efforts**

See Fugitive Dust Control Plan, Section 424.

##### **423 Monitoring Program**

Refer to the same section in the approved M&RP.

##### **424 Fugitive Dust Control Plan**

Operational areas that are used by mobile equipment will be water sprayed to control fugitive dust. The application of water will be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition unless it is below freezing.

##### **425 Additional Division Requirements**

Refer to the same section of the approved M&RP.

### **529 Management of Mine Openings**

The perimeter of the sites, **including the topsoil stockpiles** will be fenced with gates on the access roads. The well casing will have a valve that is closed and locked. The valve will also prevent access by animals or other material. **Mine openings will be monitored in accordance with Federal and State Regulations.**

**During the life of the methane wells, the sites will be inspected as needed by mine personnel to verify the continued operation of the pumping equipment and general site conditions.**

### **530 OPERATIONAL DESIGN CRITERIA AND PLANS**

#### **531 General**

This section contains the general plans for the construction of sediment controls and general construction and maintenance of the well sites.

The decision to construct each well will be based on the amount of methane encountered during mining. If small amounts of methane are encountered and the mine's ventilation system can dilute the methane, no well will be drilled. The proposed well site locations are shown on Figure 1-1.

#### **532 Sediment Control**

Sediment control measures for the well sites are described in Sections 732 and 742 of this submittal. Runoff control structures at the well sites have been designed to convey runoff in a non-erosive manner. Sediment yields in the well permit area are minimized by:

- Disturbing the smallest practicable area during the construction of the well site and
- Contemporaneously reclaiming areas suitable for such reclamation.

### **533 Impoundments**

No impoundments will exist at the well sites.

### **534 Roads**

Refer to Section 527 of this submittal.

### **535 Spoil**

No spoil will be generated at the well sites.

### **536 Coal Mine Waste**

No coal mine waste will be stored at the well sites.

### **537 Regraded Slopes**

#### **537.100 Division Approval**

No mining or reclamation activities will be conducted in the permit area that requires approval of the Division for alternative specifications or for steep cut slopes.

#### **537.200 Regrading of Settled and Revegetated Fills**

Upon completion of the well site, the areas not required for the exhaust blower will be regraded to approximate original contour. Because of the nature of the well site, settling is not anticipated. However, if settlement does occur, these areas will be regraded.

## **722 Cross Sections and Maps**

### **722.100 Location and Extent of Subsurface Water**

Figure 7-1 in the approved M&RP shows a generalized hydrostratigraphic cross section of the permit and adjacent areas including the well sites. Section 724.100 of the approved M&RP provides baseline groundwater conditions.

### **722.200 Location of Surface Water Bodies**

Plate 7-2 in the approved M&RP shows the locations of surface-water bodies and existing or pending water rights. Section 724.200 of the approved M&RP provides baseline surface water conditions.

### **722.300 Locations of Monitoring Stations**

Plate 7-1 in the approved M&RP shows the location of surface water and groundwater monitoring stations.

### **722.400 Locations and Depth of Water Wells**

Refer to Section 722.400 and Plate 7-1 of the approved M&RP for information pertaining to the groundwater monitoring wells. Refer to Appendix 7-9 of approved M&RP for details pertaining to the Gilson well.

### **722.500 Surface Topography**

Surface topography features at the well sites and adjacent areas are shown on Figures 1-1, 5-1, 5-5 and 5-9. **Refer to Plate 1-4 in the M&RP for well locations.**

### **728.100 Potential Impacts of Surface and Groundwater**

Potential impacts of the well sites in this area on the quality and quantity of surface and groundwater flow may include contamination from materials associated with the drilling of the wells. The potential impact is addressed in Section 728.300 of this submittal and the approved M&RP.

### **728.200 Baseline Hydrologic and Geologic Information**

Baseline geologic information is presented in Chapter 6 of the approved M&RP. Baseline hydrologic information is presented in Section 724.100 and 724.200 of the approved M&RP.

### **728.300 PHC Determination**

**Potential Impacts to the Hydrologic Balance** - Potential impacts of the Dugout Canyon Mine on the hydrologic balance of the well sites and adjacent areas are addressed in the subsections of this submittal and the approved M&RP.

**Acid and Toxic Forming Materials** - No acid or toxic forming materials have been identified in the soils or strata of the Dugout Canyon Mine (Chapter 6, Section 623 of this submittal). Additional information is located in Appendix 6-2 of the approved M&RP. ~~and Section 542.500 of this submittal.~~

**Groundwater** - During drilling of the wells, the groundwater encountered will be affected. Drilling mud will be used to seal the groundwater aquifers. Once drilling is completed, the casing will be grouted in the well hole. This will seal the aquifers to prevent any groundwater from migrating down the outside of the casing into the mine.

#### **746.400 Return of Coal Processing Waste to Abandoned Underground Workings**

No coal processing waste will be generated at the well sites.

#### **747 Disposal of Non-Coal Mine Waste**

All non-coal mine waste will be disposed of at an approved landfill.

#### **748 Casing and Sealing Wells**

Refer to Section 542.700 of this submittal.

### **750 PERFORMANCE STANDARDS**

#### **751 Water Quality Standards and Effluent Limitations**

~~Water encountered during drilling will flow into the mud pit and will not be discharged.~~ Water encountered during drilling and runoff water will be treated using silt fence and/or straw bale dikes prior to leaving the site. Should it become necessary the water encountered during drilling will be pumped into a tank and hauled from the site for disposal at a licensed facility.

#### **752 Sediment Control Measures**

All sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs presented in Section 732, 742, and 760 of this submittal.

## **810 BONDING DEFINITIONS AND DIVISION RESPONSIBILITIES**

This chapter provides information regarding the bonding for reclamation of the well sites at the Dugout Canyon Mine. CFC has on file with the Division a bond or bonds payable to the Division for performance of all requirements of the State Program.

## **820 REQUIREMENTS TO FILE A BOND**

A description of the disturbed area location for each well site is found in Chapter 1, Table 1-1. Reclamation of the disturbed areas are discussed in Section 340 of this submittal. The performance bond period is for the duration of coal mining and reclamation operations including the extended period designated by the Division. The bond is in the form of a surety bond and is described in Section 860 of the M&RP.

## **830 DETERMINATION OF BOND AMOUNT**

The present bond of \$3,682,000 should be sufficient to assure the completion of the reclamation plan. The reclamation bond (direct and indirect costs) for the well sites is ~~\$62,530~~ **78,000 (2005 dollars)**. The most current formulas from the Office of Surface Mining, *Handbook for Calculation of Reclamation Bond Amounts*, April 2000 were used to determine the coverage necessary for reclamation (Means 2002). The reclamation plan and design criteria concerning the well sites can be found in Sections 540 and 550. The bonding information pertaining to the well sites will be incorporated into Appendix 5-6 of the approved M&RP upon approval of the bond. The bond coverage will be adjusted per the Division's determination of required bond coverage.

## **840 GENERAL TERMS AND CONDITIONS OF THE BOND**

Refer to Chapter 8 of the approved M&RP.

Canyon Fuel Company, LLC  
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## **410 LAND USE**

### **411 Environmental Description**

A statement of the conditions and capabilities of the land to be affected by mining and reclamation operations follows in this section.

#### **411.100 Premining Land Use**

The area is utilized for the landowners private use, including hunting and as open range for livestock and wildlife.

#### **411.110 Land Use Map and Narrative**

Refer to the same section of the approved M&RP.

#### **411.120 Land Capability**

The major plant communities at the well sites are identified in Section 321. No cultivated lands lie within the well boundaries, due to the limiting terrain and lack of water for irrigation. Refer to Section 321.200, Table 3-1 of this submittal for forage production per acre for each well site.

The well site areas are located on the flatter mesa tops and rolling terrain. This type of terrain receives heavier pressure because of more available forage and easier movement by livestock.

#### **411.130 Land Use Description**

The wells are located on land administered by Milton & Ardith Thayn Trust and zoned by Carbon County for mining and grazing (MG-1).

No industrial or municipal facilities are located on or immediately adjacent to the well sites.

#### **411.140 Cultural and Historic Resources Information**

**Cultural and Historic Resource Maps** - Archaeological surveys were conducted in June 2003, of the well sites. Nothing was found that required future investigation. There are no cemeteries, public parks, or units of the National System of Trails or the Wild and Scenic Rivers System located within the well site boundaries. The report can be found in Attachment 4-1 of this submittal.

Previous research in 1980 by "AERC surveyed several sample blocks in Sections 13 and 24, T13S, R12E and Sections 18, 19 and 30 T13S, R13E. They also surveyed the access road into the Snow Mine site. One archeological site (42CB292) was located. The site was described as "Coal mine located in Pace Canyon consists of one known mine portal which has been closed. Site of historic Snow Mine in Pace Canyon which was active in 1906 but had its primary production period from 1932-1940." The site was relatively pristine at the time and still contained a standing coal loadout and foundation with depth potential. Avoidance was recommended pending further historic research. As noted the site has since been extensively modified" (Attachment 4-1, Senco-Phenix, June 24, 2003, SPUT-455, page 2).

Access to the degas holes will not impact or disturb what remains of the archeological site (42CB292). The road in the bottom of Pace Canyon passes the archeological site, but the closed portal is not visible from the road, therefore there is nothing to draw attention to the site. The loadout referenced in the survey no longer exist at the site. Access to the degas holes is as follows (per request by Pricilla Burton, UDOGM, August 2003): Turn left (north) off US Highway 6 (eastbound)

7 miles beyond the city of Wellington onto a dirt road, proceed on dirt road 8 miles to an intersection turn left (west) and proceed 1.5 miles to locked gate, proceed onto road in the bottom of Pace Canyon travel an additional 1 mile to intersection turn left (northwest), travel 1.5 miles to intersection turn left (southwest), proceed 0.5 miles to intersection turn left (south) proceed 0.3 miles to drill site G-3. To proceed to G-2 turn north from G-3 travel 0.3 miles turn left, travel 0.25 miles to intersection turn left (south) proceed 500 feet and turn left 100 feet to drill site G-2. To proceed to G-1 turn right and travel 100 feet, turn right and travel 500 feet, turn left (west) travel 500 feet to intersection turn right, proceed 1000' to drill site G-1. All mileage/footage is approximate.

Dugout Canyon agrees to notify the Division and State Historical Preservation Office (SHPO) of previously unidentified cultural resources discovered in the course of operations. Dugout Canyon also agrees to have any such cultural resources evaluated in terms of NRHP eligibility criteria. Protection of eligible cultural resources will be in accordance with Division and SHPO requirements. Dugout Canyon will also instruct its employees that it is a violation of federal and state law to collect individual artifacts or to otherwise disturb cultural resources.

#### **411.200 Previous Mining Activity**

Dugout Canyon has no knowledge of the removal of coal or other minerals in the well site areas.

#### **412 Reclamation Plan**

##### **412.100 Postming Land-Use Plan**

All uses of the land prior to the wells construction/operation and the capacity of the land to support prior alternate uses will remain available throughout the life of the sites.

Dugout Canyon intends the postmining land use to be livestock and wildlife grazing and other uses as dictated by the land owner (hunting, etc.). Final reclamation activities will be completed in a manner to provide the lands able to parallel the premining land use.

#### **412.200 Land Owner or Surface Manager Comments**

Milton & Ardith Thayn Trust is the landowner. Canyon Fuel Company, LLC has a surface land owner agreement with the Thayne Trust for the drilling of degassification holes (Attachment 4-2). Prior to drilling the landowner will be contacted and the requirements related to drilling as outlined in the surface land owner agreement will be met. A copy of the letter will be included in Attachment 4-2.

#### **413 Performance Standards**

##### **413.100 Postmining Land Use**

Postmining land uses are discussed in Section 412.100. The postmining lands will be reclaimed in a timely manner and capable of supporting such uses (see Chapters, 2, 3, 5, and 7).

##### **413.200 Determining Premining Uses of Land**

Refer to Section 411.100.

##### **413.300 Criteria for Alternative Postmining Land Uses**

No alternative postmining land uses have been planned.

#### **414 Alternative Land Use**

No alternative postmining land uses have been planned.

#### **420 AIR QUALITY**

##### **421 Air Quality Standards**

Dugout Canyon activities will be conducted in compliance with the requirements of the Federal Clean Air Act and the Utah Air Conservation Rules.

##### **422 Compliance Efforts**

See Fugitive Dust Control Plan, Section 424.

##### **423 Monitoring Program**

Refer to the same section in the approved M&RP.

##### **424 Fugitive Dust Control Plan**

Operational areas that are used by mobile equipment will be water sprayed to control fugitive dust. The application of water will be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition unless it is below freezing.

##### **425 Additional Division Requirements**

Refer to the same section of the approved M&RP.

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### **529 Management of Mine Openings**

The perimeter of the sites, including the topsoil stockpiles will be fenced with gates on the access roads. The well casing will have a valve that is closed and locked. The valve will also prevent access by animals or other material. Mine openings will be monitored in accordance with Federal and State Regulations.

During the life of the methane wells, the sites will be inspected as needed by mine personnel to verify the continued operation of the pumping equipment and general site conditions.

## **530 OPERATIONAL DESIGN CRITERIA AND PLANS**

### **531 General**

This section contains the general plans for the construction of sediment controls and general construction and maintenance of the well sites.

The decision to construct each well will be based on the amount of methane encountered during mining. If small amounts of methane are encountered and the mine's ventilation system can dilute the methane, no well will be drilled. The proposed well site locations are shown on Figure 1-1.

### **532 Sediment Control**

Sediment control measures for the well sites are described in Sections 732 and 742 of this submittal. Runoff control structures at the well sites have been designed to convey runoff in a non-erosive manner. Sediment yields in the well permit area are minimized by:

- Disturbing the smallest practicable area during the construction of the well site and
- Contemporaneously reclaiming areas suitable for such reclamation.
-

### **533 Impoundments**

No impoundments will exist at the well sites.

### **534 Roads**

Refer to Section 527 of this submittal.

### **535 Spoil**

No spoil will be generated at the well sites.

### **536 Coal Mine Waste**

No coal mine waste will be stored at the well sites.

### **537 Regraded Slopes**

#### **537.100 Division Approval**

No mining or reclamation activities will be conducted in the permit area that requires approval of the Division for alternative specifications or for steep cut slopes.

#### **537.200 Regrading of Settled and Revegetated Fills**

Upon completion of the well site, the areas not required for the exhaust blower will be regraded to approximate original contour. Because of the nature of the well site, settling is not anticipated. However, if settlement does occur, these areas will be regraded.

## **722 Cross Sections and Maps**

### **722.100 Location and Extent of Subsurface Water**

Figure 7-1 in the approved M&RP shows a generalized hydrostratigraphic cross section of the permit and adjacent areas including the well sites. Section 724.100 of the approved M&RP provides baseline groundwater conditions.

### **722.200 Location of Surface Water Bodies**

Plate 7-2 in the approved M&RP shows the locations of surface-water bodies and existing or pending water rights. Section 724.200 of the approved M&RP provides baseline surface water conditions.

### **722.300 Locations of Monitoring Stations**

Plate 7-1 in the approved M&RP shows the location of surface water and groundwater monitoring stations.

### **722.400 Locations and Depth of Water Wells**

Refer to Section 722.400 and Plate 7-1 of the approved M&RP for information pertaining to the groundwater monitoring wells. Refer to Appendix 7-9 of approved M&RP for details pertaining to the Gilson well.

### **722.500 Surface Topography**

Surface topography features at the well sites and adjacent areas are shown on Figures 1-1, 5-1, 5-5 and 5-9. Refer to Plate 1-4 in the M&RP for well locations.

### **728.100 Potential Impacts of Surface and Groundwater**

Potential impacts of the well sites in this area on the quality and quantity of surface and groundwater flow may include contamination from materials associated with the drilling of the wells. The potential impact is addressed in Section 728.300 of this submittal and the approved M&RP.

### **728.200 Baseline Hydrologic and Geologic Information**

Baseline geologic information is presented in Chapter 6 of the approved M&RP. Baseline hydrologic information is presented in Section 724.100 and 724.200 of the approved M&RP.

### **728.300 PHC Determination**

**Potential Impacts to the Hydrologic Balance** - Potential impacts of the Dugout Canyon Mine on the hydrologic balance of the well sites and adjacent areas are addressed in the subsections of this submittal and the approved M&RP.

**Acid and Toxic Forming Materials** - No acid or toxic forming materials have been identified in the soils or strata of the Dugout Canyon Mine (Chapter 6, Section 623 of this submittal). Additional information is located in Appendix 6-2 of the approved M&RP.

**Groundwater** - During drilling of the wells, the groundwater encountered will be affected. Drilling mud will be used to seal the groundwater aquifers. Once drilling is completed, the casing will be grouted in the well hole. This will seal the aquifers to prevent any groundwater from migrating down the outside of the casing into the mine.

**Potential Hydrocarbon Contamination** - Hydrocarbon products will not be stored at the well sites, however fuels, greases, and other oils may leak from equipment during drilling operations.

**746.400 Return of Coal Processing Waste to Abandoned Underground Workings**

No coal processing waste will be generated at the well sites.

**747 Disposal of Non-Coal Mine Waste**

All non-coal mine waste will be disposed of at an approved landfill.

**748 Casing and Sealing Wells**

Refer to Section 542.700 of this submittal.

**750 PERFORMANCE STANDARDS**

**751 Water Quality Standards and Effluent Limitations**

Water encountered during drilling and runoff water will be treated using silt fence and/or straw bale dikes prior to leaving the site. Should it become necessary the water encountered during drilling will be pumped into a tank and hauled from the site for disposal at a licensed facility.

**752 Sediment Control Measures**

All sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs presented in Section 732, 742, and 760 of this submittal.

## **810 BONDING DEFINITIONS AND DIVISION RESPONSIBILITIES**

This chapter provides information regarding the bonding for reclamation of the well sites at the Dugout Canyon Mine. CFC has on file with the Division a bond or bonds payable to the Division for performance of all requirements of the State Program.

## **820 REQUIREMENTS TO FILE A BOND**

A description of the disturbed area location for each well site is found in Chapter 1, Table 1-1. Reclamation of the disturbed areas are discussed in Section 340 of this submittal. The performance bond period is for the duration of coal mining and reclamation operations including the extended period designated by the Division. The bond is in the form of a surety bond and is described in Section 860 of the M&RP.

## **830 DETERMINATION OF BOND AMOUNT**

The present bond of \$3,682,000 should be sufficient to assure the completion of the reclamation plan. The reclamation bond (direct and indirect costs) for the well sites is \$78,000 (2005 dollars). The most current formulas from the Office of Surface Mining, *Handbook for Calculation of Reclamation Bond Amounts*, April 2000 were used to determine the coverage necessary for reclamation (Means 2002). The reclamation plan and design criteria concerning the well sites can be found in Sections 540 and 550. The bonding information pertaining to the well sites will be incorporated into Appendix 5-6 of the approved M&RP upon approval of the bond. The bond coverage will be adjusted per the Division's determination of required bond coverage.

## **840 GENERAL TERMS AND CONDITIONS OF THE BOND**

Refer to Chapter 8 of the approved M&RP.