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Section 2.05.3(3)

Mine Facilities

Table of Contents

LIST OF TABLES

~~**List of Attachments**~~

Section 2.05.3(3)

Mine Facilities

1. Introduction

This section contains a description of the proposed structures to be used in connection with or to facilitate the surface coal mining and reclamation activities at the New Horizon 2 mine area described in Section 2.05.3, Operation Plan: Permit Area.

Facilities approved for construction at the New Horizon 2 mine area by previous permit versions and the current version are described in the following sections. Some of the facilities have not yet been built. Construction of these will occur on an as needed basis consistent with the permit requirements.

2. Sediment and Water Control Facilities Plan

Western Fuels-Colorado will use various types of structures to control the runoff from disturbed areas within the permit boundaries at the New Horizon Mine. In addition, surface mining activities will be planned and conducted to minimize disturbance of the prevailing hydrologic balance in both the mine plan and adjacent areas in order to prevent long-term adverse changes in the hydrologic balance.

Sediment control measures will include proper utilization of mining and reclamation methods and sediment control practices singly or in combination. Sediment control methods may include, but not be limited to the following:

1. Disturbing the smallest practicable area at any one time during the mining and construction operation;

2. Stabilizing graded material to promote a reduction in the rate and volume of runoff;

3. Retaining sediment within disturbed areas;

4. Diverting runoff away from disturbed areas including stockpiles, back slopes, and material storage;

5. Diverting runoff through disturbed areas using stabilized earth channels, culverts or pipes so as to prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;

6. Using straw dikes, silt fences, small V-ditches, riprap, mulches, check dams, vegetative sediment filters, temporary cover crops, sediment traps, and other measures that will reduce overland flow velocity, reduce runoff volume, or trap sediment;

7. Treating traffic areas with water or dust suppressant to reduce the potential for wind and water erosion.

In addition, WFC may utilize appropriate sediment control measures representing the best technology currently available which may include, but not be limited to the following:

1. A series of sedimentation ponds;

2. Soil surface mechanical manipulation measures that include contour furrowing, chisel plowing, etc.;

3. Topographic manipulations that include recontouring or reshaping of graded material in a manner that minimizes the potential for soil erosion;

4. Surface protection measures that include surface stabilizers such as temporary cover crop, permanent vegetation covers, or geotextile fabrics, etc.;

5. Linear detention and filtering structures that include filter fence, straw bale barrier, brush barrier, and filter berms;

6. Measures used in conjunction with overland conveyances including check dams, sediment traps, and water level spreaders;

7. Vegetative filters, temporary cover crops, reestablished permanent vegetation covers, etc.

All surface mining operations will be conducted to achieve the effluent limitations of 4.05.27(7) for all mixed drainage when it leaves the permit area.

Sedimentation ponds or impoundments will be constructed before creating new disturbances, unless approved drainage diversions or other surface water control structures are installed.

3. Collection Ditches, Culverts and Diversion Design Parameters

The main collection ditches in the original permit area are the 007 East and 007 West Ditch. These have been renamed Ditches C18 and C17, respectively. These ditches are used to transport runoff into Sedimentation Pond 007 for treatment in accordance with the requirements of applicable regulations. The location and drainage area of these ditches can be found on Map 2.05.3-1. All ditch and culvert designs for the entire site have been reviewed for the Mid Term Review of 2006. This review resulted in the redesign of some culverts and ditches, all of which are presented Attachment 2.05.3 (3) -1. As of the Mid Term Review of 2006, there are no surface water control structures of any kind at the New Horizon #1 site.

All ditches were designed and constructed in accordance with the applicable regulations in 4.05.3. Diversions will be designed, constructed, and maintained in a manner which prevents additional contributions of suspended solids to stream flow and to runoff outside the permit area, to the extent possible, using the best technology currently available. Appropriate sediment control measures for these diversions may include, but not be limited to, maintenance of appropriate gradients, channel lining, revegetation, roughness structures, and detention basins. No diversion will be located so as to increase the potential for landslides. When no longer needed, each temporary diversion will be removed and the affected land regraded, topsoiled, and revegetated in accordance with 4.06, 4.14, and 4.15. If the temporary diversion was for an ephemeral stream, the channel will be reestablished to functionally blend with the undisturbed drainage above and below the area to be reclaimed. Diversion design will incorporate the following:

(a) Most ditches will not need to be lined, however, any stretch of collection ditch which has a velocity above 5.5 feet per second will be lined. Channel linings, including channel riprap, will be designed using standard engineering practices to pass safely the design velocities. These velocities assume the typical silty loam soil conditions on site. If better conditions exist, the velocities will be allowed to increase without lining. If worse conditions exist, lining may be needed for lower velocities.

(b) Freeboard will be a minimum of 0.3 feet. Protection will be provided for transition of flows and for critical areas such as swales and curves when excessive velocities are anticipated.

(c) Energy dissipators will be installed when necessary, such as at discharge points, where diversions intersect with natural streams and exit velocity of the diversion flow is greater than that of the receiving stream.

(d) Excess excavated material not necessary for diversion channel geometry or regrading of the channel will be disposed of in accordance with 4.09.

(e) Topsoil will be handled in compliance with 4.06.

(f) All ditches, culverts and diversions will be temporary, therefore peak flows will be designed for the 10 year 24 hour event of 2.0 inches. The exceptions to this are Ditches C2, C5, C11, C12, C13, C14, C17, C19, C20 and ~~C20~~C29, which are permanent. Also, Culverts 117 and 129 are permanent and have been designed for the 100 year 24 hour event. These designs also satisfy County regulations.

As shown on Map 2.05.3(3)-1, the permit area has been divided into many collection ditch and culvert basins. All ditches, culverts and their respective watershed basins are labeled on the map. Most of the culverts are needed to get disturbed areas under roads to the downstream collection ditch or sediment pond.

4. Designs for all ditches in the permit area

Designs for all ditches were accomplished in the following steps:

1) using a 3D grid of the watershed, the actual area and average land slope was developed.
2) a long flow line was drawn from the top of each watershed to the bottom of the ditch.
3) using the SCS Method provided within SURVCADD, the time of concentration was developed for each watershed.
4) using the Time of Concentration and a worst case curve number, the peak flow was also developed within SURVCADD using the SCS graphical method.

5) Using the maximum velocities stated earlier, ditch slopes, depth and bottom width geometry were then calculated for the channels.

Designs for all culverts were done in a similar manner except that once the peak flows for the culvert watersheds were calculated, the standard FHA procedures were used to properly size the culvert. For all culverts, a corrugated metal pipe was used with inlet control. In order to standardize culverts, a few culvert sizes were selected for all situations although, in some cases, the culvert is over designed. Although WFC commits to maintaining the culverts in good condition, we only commit to the cross-sectional area needed to pass the design peak flow, not the entire area of the culvert.

5. Sedimentation Pond 007

Other ponds design details are discussed in Attachments 2.05.3(3)-4, 2.05.3(3)-5, 2.05.3(3)-6 and 2.05.3(3)-11. In accordance with 4.05.2 and the approved NPDES permit, WFC will use Pond 007 to prevent, to the extent possible, additional contributions of sediment to stream flow or runoff outside the permit area due to mining disturbance (see Map 2.05.3(**3**)-1). Attachment 2.05.3(3)-2 gives the design calculations on Sediment Pond 007. Attachment 2.05.3**(3)**-3 gives the typical soil grain size distribution information. Maps 2.05.3(3)-2-1 and 2.05.3(3)-2-2 shows the as-built design of Pond 007.

The sedimentation pond is designed, constructed, and maintained to:

a. Provide storage for the runoff or inflow entering the pond as a result of a 10-year, 24-hour precipitation event and to meet all applicable State and Federal regulations for all effluent limitations before discharge from the permit area. The characteristics of the mine site, reclamation procedures, and on site sediment control practices are also considered in the design.

b. The sedimentation pond was designed to provide adequate sediment storage volume in compliance with the CDMG regulations.

c. An appropriate non-clogging dewatering device will be installed to maintain a 10-year, 24-hour storage volume.

d. Appropriate combinations of principal and emergency spillways to safely discharge the runoff from a 25-year, 24-hour precipitation or larger event, as required by the CDMG's regulations, will be installed.

The sediment storage capacity of the sedimentation pond will be periodically monitored to ensure that at least one year of sediment storage is available beneath the principal spillway inlet (based on the U.S.L.E. or the equivalent sediment storage of one 10-year, 24-hour storm event based on the M.U.S.L.E.). When adequate capacity is no longer available, sediment removal or other corrective actions will be taken to restore adequate sediment storage capacity to the pond.

Corrective action required to restore adequate sediment storage capacity may include the following:

1. Raise the spillway and redesign the pond in order to restore adequate storage capacity and to comply with the applicable regulations.

2. Excavate the pond area and enlarge the sediment storage capacity.

The excavated material suitable for topsoil will be salvaged ~~in a stockpile~~and used for reclamation. The excavated material that is not suitable for a topsoil-like medium will be graded into the surrounding topography within the disturbance area, topsoiled, and revegetated in accordance with WFC's approved reclamation plan. Site specific conditions will determine the construction methods and equipment utilized at the time of excavation. Sediment removal and water discharges will be conducted consistent with the approved mining permit, the NPDES permit, and CDMG Regulations Section 4.05.6(3)(b). All sedimentation ponds will be inspected quarterly under the supervision of a registered professional engineer and reported to the CDMG. The revised NPDES Permit is enclosed in Attachment 2.05.3(3)-18.

Pit dewatering ~~will be~~into Pond 007 was primarily a ~~seasonal~~constant occurrence while mining was taking place east of 2700 Road. The dewatering process ~~will be a sporadic,~~was operation-controlled~~ occurrence~~, depending on various factors which may include the location of the pit inflows, the location of standing water in the pit, or the location within the pit of the overburden and coal removal operations. When pit dewatering ~~is~~was required, the anticipated dewatering rate ~~will be~~was in the range of one to two cubic feet per second or less. ~~Direct pit pumping into Pond 007 is planned for the mining east of 2700 Road.~~ Once mining continue~~s~~d west of 2700 Road, Pond 011 will be used to detain the pit pumping prior to discharge. At that time, Pond 007 will be somewhat over designed. These procedures have been approved in WFC's NPDES Permit CO-0000213. A new discharge point has been applied for to utilize the Pond 011 site. See Attachment 2.05.3(3)-18. Actual water flow velocity going into Pond 007 and Pond 011 will be controlled with adequate energy dissipaters (i.e., rock riprap, geotextiles, metal or concrete energy dissipator boxes, etc.) or discharged onto non-erodible bedrock material. This will minimize erosion of the pond banks.

The mine pit dewatering shifted from Pond 007 to Pond 011 in June 2008. It is anticipated that pit dewatering will then be transferred from Pond 011 to Pond 013 sometime in late 2010 or beginning of 2011. Pond 011 is covered under a NPDES Discharge Permit.

Pit dewatering will have an insignificant impact on Pond 007, as shown in Attachment 2.05.3.(3)-2. Pit dewatering will be sporadic versus continuous. The flow rate of one to two cubic feet per second or less compared to the designed 10-year, 24-hour peak inflow rate of 123.7 cubic feet per second is very insignificant. In addition, pit water high in suspended solids will be allowed to set for a period of time so the solids are allowed to settle out of the water and will remain in the active pit area. Only after the pit water is clear, will it be pumped from the pit into Pond 007. Further more, all discharge from Pond 007 will be in accordance with applicable discharge permits.

Pond 007 will be maintained after reclamation as requested by the landowner. The demonstration that this pond retention is in compliance with Rule 4.05.9(13) is included in Attachment 2.05.3(3)-16 DEMONSTRATION FOR RETENTION OF POND 007.

The sedimentation pond slopes will be protected from erosion where surface runoff enters the pond area.

Monitoring for rills and gullies on the pond and other reclaimed slopes will be carried out on a periodic basis; the monitoring being geared to those periods after spring snow melt and during required quarterly pond inspections.

Occurrence of excessive rills and gullies will result in implementation of the following plan. One of, or a combination of, the following options and corrective methods will be employed:

> If it is determined that the topography of the regraded area is such that drainage is concentrated in a particular area, then this area will be improved to accept the runoff.

In areas where no natural armoring is present, the drainage bottom or channel will be reshaped, if needed. The channel bottom will either be seeded, covered with erosion matting and seeded, or rocked. The method used will, of course, depend on site conditions. Continued observations will be made of this area for problems or necessary maintenance.

On slopes where no swale or defined channel exists, regrading, or disking, or chisel plowing will be performed, depending on the extent of the erosion. Reseeding will then take place.

In addition to the above, contour furrows in and above the erosion area may be constructed to trap and slow down the runoff. Straw dikes can also be used where appropriate to control runoff and promote revegetation.

If corrective measures described above fail, WFC proposes to observe and reevaluate the situation. A combination of the first two methods described or some variation therein will be applied. These activities can include, but are not limited to, rock channels, contour furrows or laterals with rock or matting bottoms, V ditches made with the dozer or motor grader, and subsequent revegetation.

Head cutting in channels will be controlled by a number of methods. If the area is at a point that concentrates runoff, the area will be improved to accept this runoff. This would include reshaping the channel and channel bottom, covering with erosion matting, seeding, or rocking. Inlet channel erosion will be controlled down to the average water level of the ponds. Remedial action on pond slopes will extend as far down the slopes as equipment access allows, which at a minimum will be below the level of the principal spillway of each pond.

In other areas, depending on the extent of erosion and time of year, the area will be regraded, disked, and seeded as needed. Straw bales, erosion matting, or rock fill may also be used to stabilize the area. Pond 007 will remain for stock use by the landowner.

Design Methodology

The precipitation runoff (peak flow and volume) is estimated using the Soil Conservation Service (SCS) triangular hydrograph techniques.

Design of Small Dams (U.S. Dept. of Interior, 1977).

Computations necessary for this runoff estimating technique have been computerized by various individuals and agencies. The SEDCAD program was used for the design of Pond 007.

The input consists of precipitation amount (inches), watershed area (acres), time of concentration (hours), runoff curve number (CN), representative particle-size distributions of the soil types in the watershed, sedimentology information, spillway information, etc.

The precipitation amounts for the New Horizon Mine for the design storm durations were obtained from the NOAA Precipitation Frequency Atlas Precipitation - Frequency Atlas of the Western States Volume III - Colorado, 1973, and are listed below:

10-year, 24-hour	-	2.0 inches
25-year, 24-hour	-	2.4 inches
100-year, 24-hour	-	3.0 inches

The runoff curve number (CN) is a factor relating the amount of rainfall to the amount of runoff for a given area. The soil erodibility factor ("k" factor) is a factor of a soils susceptibility to erosion and infiltration capacity. These factors are dependent upon the infiltration characteristics of the soil types and the type and amount of vegetation. Tables 2.05.3(3)-1 and 2.05.3(3)-2 in list the values of CN and "k" for different soils types at the New Horizon Mine.

The curve number (CN) and "k" factor for each of the ponds is determined as a weighted average. The undisturbed area curve number and "k" factor information is based on the soils and vegetation information found within Sections 2.04.9 and 2.04.10, respectively, of the New Horizon mine permit application.

The sediment storage is calculated using the Modified Universal Soil Loss Equation contained within the SEDCAD computer program. The spillways are designed using the spillway routing subroutine program in the SEDCAD computer program and applicable engineering procedures as described in the text of each sedimentation pond's design report. All sediment ponds are designed and located to capture surface runoff from upstream disturbance areas and to comply with all applicable State and Federal regulations.

With regards to Pond 007, it is currently over-designed for its watershed area. Originally, the watershed area was calculated to be approximately 514 acres (see Map 2.05.3(3)-2-**2**), and the pond was built in 1995 using that value. Pond 008 was permitted in 1999 and built in 2000 in the western portion of the Pond 007 watershed. The Pond 008 drainage area directly subtracts from the original Pond 007 watershed, so the Pond 007 watershed has been reduced to about 423 acres. Because of this significant reduction in area (17.7%), new run-off calculations for Pond 007 were not done.

TABLE 2.05.3(3)-1
SCS CURVE NUMBERS
FOR NEW HORIZON MINE
MONTROSE COUNTY, COLORADO

LAND USE - VEGETATION TYPE	HYDROLOGIC CONDITION	HYDROLOGIC SOIL GROUP A	B	C
Undisturbed Areas:				
Cultivated Land	Poor	76	84	88
(Small Grain)	Good	75	83	87
Rotation Meadow	Poor	75	83	85
(Contoured)	Good	69	78	83
Meadow (Riparian)	Good	58	71	78
Pasture or Range	Poor	79	86	89
	Fair	69	79	84
	Good	61	74	80
Juniper - Grass	Poor	75	85	89
	Fair	58	73	80
Upland Sagebrush - Grass	Poor	67	80	85
	Fair	51	63	70
Residential:				
1/8-acre lots	Average	85	90	92
1/4-acre lots	Average	75	83	87
1/3-acre lots	Average	72	81	86
1/2-acre lots	Average	70	80	85
1.0-acre lots	Average	68	79	84
Disturbed Areas:				
Newly Graded Areas	Average	86	91	94
Paved Roads	Average	89	92	93
Gravel Roads	Average	85	89	91
Dirt Roads	Average	82	87	89
Reclaimed Areas:				
Herbaceous Pre-Law (1977)	Average	80	87	--
Herbaceous Post-Law (1977)	Average	71	81	--

Source: USDA-SCS Technical Release 55 (2nd Edition), June, 1986

TABLE 2.05.3(3)-2
SEDIMENTATION POND DESIGN - SOILS INFORMATION*
NEW HORIZON MINE, COLORADO

Soil Type or Area	Hydrologic Soil Group	"k" Factor
18/F-2	D	0.14
5810/2B-1	B	0.17
5810/7C-2	B	0.17
5810E/D-2	B	0.17
5810I/3B-2	B	0.17
5810I/7C-1	B	0.17
9904/D-1,2	D	0.22
9904/F-2	D	0.22
1E	D	0.30
1EW	D	0.24
20C	C	0.24
30C	C	0.31
70B	B	0.34
808	D	0.32
810	D	0.24
Reclaimed	C	0.25
Active Pit + Spoil Piles	C	0.21
Non-topsoiled Regraded Spoil	C	0.23
Topsoil Removed	D	0.32
98A	B	0.24
98B	D	0.10
98C	D	0.28
98D	C	0.32
98E	B	0.28
98F	B	0.34
98G	C	0.34
98H	C	0.28

This table was revised to include the soils 98A through 98H found in the amendment area. The values for the the hydrologic soil type and the “k” factor were developed from the site specific soil survey and the help of the local SCS office in Montrose.

* Source: Gary Wendt, Soil Scientist, Peabody Coal Company (September 15, 1986 and March 7, 1988).

6. Sedimentation Ponds 008 through 01~~4~~5 Design Parameters

In accordance with 4.05.2 and NPDES regulations, WFC will use Ponds 008 through 014 to prevent, to the extent possible, additional contributions of sediment to stream flow or runoff outside the permit area due to mining disturbance. Ponds 008, 009 and 014 are as-built designs~~, 010 through 013 have~~; and Ponds 011, 012, 013 have also been constructed west of 2700 Road. Pond 015 is yet to be constructed. As of the Permit Revision 06, Pond 010 has been eliminated The drainage area that was previously to be handled by Pond 010 is now handled by Ponds 011 and 013. Revised designs of these two ponds composed to the as-built reports show that they are adequate to accept the additional drainage area. The pond designs and or run-off calculations for the permit area ponds are shown below:

Pond 007	Attachment 2.05.3(3)-2 As Built	Map 2.05.3(3)-2
Pond 008	Attachment 2.05.3(3)-4	Map 2.05.3(3)-4-1
Pond 009	Attachment 2.05.3(3)-5	Map 2.05.3(3) -5-1
Pond~~s 010 &013~~ 013	Attachment 2.05.3(3)-6	Map 2.05.3(3)-6-1
Pond 011	Attachment 2.05.3(3)-14	Map 2.05.3(3)-14
Pond 012	Attachment 2.05.3(3)-12 and 13	Maps 2.05.3(3)-12-1 through 4
Pond 014	Attachment 2.05.3(3)-11	Map 2.05.3(3)-11

Pond~~s~~ 015 ~~and 016 are in the western edge of the permit area and have not yet been fully designed as of the Mid Term Review of 2006. No disturbance is close to this area as of this date.~~ Attachment 2.05.3(3)-20 Map 2.05.3(3)-15

Ponds 007 and 008 are the only ponds that will remain after reclamation. Pond 013 will remain for sometime after the reclamation of the surrounding land, but will not be permanent. The demonstration to allow retention of Pond 007 is Attachment 2.05.3(3)-16. The demonstration to allow retention of Pond 008 is Attachment 2.05.3(3)-19.

Map 2.05.3(3)-1 shows the locations of the as-built and yet-to-be built ponds.

Pond 014 ~~is~~was the post-mine conversion of the pre-mine SAE #2. ~~The drainage area is 4.4 acres, but a contour ditch that drains to Pond 009 crosses the Pond014 drainage and reduces the effective drainage for sediment control purposes to 2.1 acres. The contour ditch dimensions will be about two feet wide at bottom and the downslope side will be about two feet high with a 2:1 slope. The contour ditch, as well as Pond 014 itself, will be removed~~

~~for the reclamation of the site. The pond details are shown on Map 2.05.3(3)-11.~~ It was reclaimed along with the BB detour road and no longer exists as of April 2010.

The sedimentation ponds are designed, constructed, and maintained as follows:

a) ~~Pond 010 has been designed to provide storage for the runoff or inflow entering the pond as a result of a 10-year, 24-hour precipitation event and to meet all applicable State and Federal regulations for all effluent limitations before discharge from the permit area.~~ Ponds 008, 009, 011, 012 and 013 have been designed to contain the 25 year 24 hour event with no discharge from the emergency spillway. Pond 011 will have an expected permanent discharge of 1.34 cfs due to pit pumping, but all sediment pond rules are also satisfied, as shown in Attachment 2.05.3(3)-14. ~~Pond 010 design includes routing the 25 year event through the emergency spillway.~~ Ponds 014 & 015 excavation ha~~s~~ve been designed for a 100-year 24-hour event with no discharge. Due to ~~its~~their small drainage area and completely incised impoundment, there ~~is~~are no embankments to fail and so only run-off volume calculations have been performed. ~~Only b) below pertains to Pond 014 and volumes were determined using SEDCAD4 instead of SurvCADD software.~~

b) The sedimentation ponds are designed to provide adequate sediment storage volume in compliance with the CDMG regulations. The actual designs are based on 3 year sediment volumes based on USLE calculations. Actual construction may cut more volume below the dam level (incised storage) to lessen expensive cleanout during the operation.

c) The principal spillway design is an 18-24" diameter CMP or other pipe which will have a valve on the entrance. This pipe will be stopped down in the inlet side to a 6" valve which will be controlled by a wheel on the pond embankment. During normal conditions, the valve will be ~~shut~~left slightly open to provide 24 hour detention time for each pond during the large events. This is accounted for as weep holes in the SEDCAD design runs. When a large event occurs, the operator will wait ~~a minimum of 36 hours after the storm has ceased to check the water still detained by the pond~~until the Imhoff cone test shows that the water meets effluent standards prior to discharge. If an Imhoff cone shows that the water meets the effluent standard of 0.5ml settleable solids per liter, the valve will be opened until the water has dissipated to the valve level. It will then be ~~shut~~left slightly open to allow detention time for subsequent storms. For Ponds 00~~7~~8, ~~008~~011, 012 and 01~~1~~3, SEDCAD analysis has shown that the effluent from a slightly cracked open valve (equivalent of a garden hose) still meets effluent requirements. For these ponds, the operator can decide to leave the valve cracked or shut as described above.

d) Appropriate combinations of principal and emergency spillways to safely contain or discharge the runoff from a 25-year, 24-hour precipitation or larger event, as required by the CDMG's regulations, will be installed. If a pond is designed to contain the runoff from a 25 year 24 event, an emergency spillway cut into the dam will still be installed.

e) Pond freeboard will be a minimum of 1.0 feet from the highest level of water allowed in the pond (or emergency spillway) to the top of dam.

f) All pond dams will be designed to have a height of less than 10.0 feet measured from the original ground in the middle of the dam to the top of the dam. The top of dam width will be at least 10.0 feet in all areas.

g) All ponds will have a keyway cut along the entire width of the dam as shown on Map 2.05.3(3)-6-1**.** This keyway will be filled with competent material and compacted to the same standards as the dam foundation.

h) All principal spillways will have 2 seep collars installed within the dam which will be at least 2x the pipe diameter. All dam fill will be compacted around the seep collars and principal spillway pipe to 90% of the maximum dry density of the fill material.

i) The emergency spillways will be a rip-rap lined trapezoidal channel of 10 feet bottom width and 2:1 sideslopes.

k) Attachment 2.05.3(3)-15 demonstrates that the given materials on site have been tested for suitability in constructing pond embankments and that the long term slope safety factors exceed 1.3 in all cases, given the pond design parameters outlined above and in the Attachment. For this reason, no individual slope stability analyses are presented for the ponds.

Pit dewatering may occur year round or during portions of a year. The dewatering process will be a sporadic operation-controlled, occurrence depending on various factors which may include the location of the pit inflows, the location of standing water in the pit, or the location within the pit of the overburden and coal removal operations. When pit dewatering is required, the anticipated dewatering rate will be in the range of one to two cubic feet per second or less. ~~Until~~Prior to Pond 011 ~~is~~being built, all pit dewatering discharges ~~will be~~were directed to Pond 007, which ~~is~~was the main pond for the western portion of the permit area. ~~However, once Pond 011 is constructed, d~~Direct pit pumping into ~~it may occur if conditions warrant~~Pond 011 now occurs. These procedures ~~will~~have been applied for in WFC's NPDES Permit, which ~~will be~~is similar to Permit CO-0000213 for Ponds 007, 008 and 009. The revised NPDES Permit is enclosed in Attachment 2.05.3(3)-18.

~~Actual water flow velocity going into Pond 010 (when built) will be controlled with adequate energy dissipators (i.e., rock riprap, geotextiles, metal or concrete energy dissipator boxes, etc.) or discharged onto non-erodible bedrock material. This will minimize erosion of the pond banks.~~*The mine pit dewatering shifted from Pond 007 to Pond 011 in June 2008. It is anticipated that pit dewatering will then be transferred from Pond 011 to Pond 013 sometime in late 2010 or beginning of 2011. Pond 011 is covered under a NPDES Discharge Permit.*

Pit dewatering will have an insignificant impact on Pond 011. The flow rate of one to two cubic feet per second or less compared to the designed 25-year, 24-hour peak inflow rate of 33.5 cubic feet per second is not significant. This is demonstrated in detail in Attachment 2.05.3(3) 2.05.3(3)-14 POND 11 ENGINEERING AND HYDROLOGIC DESIGN. In addition, pit water high in suspended solids will be allowed to set for a period of time so the solids are allowed to settle out of the water and will remain in the active pit area. ~~Furthermore, all discharge from Pond 010 will be in accordance with applicable discharge permits.~~

Ponds 009, ~~010,~~ 011, 012, 013, 014, ~~015,~~ and 01~~6~~5 will be maintained until:

1) the disturbed areas are reclaimed and the vegetation success requirements of Section2.05.4(2)(e), Revegetation, are met,

2) the untreated drainage from the disturbed area ceases to contribute additional suspended solids above natural conditions, and

3) the drainage leaving the pond meets applicable State and Federal water quality requirements, if any, for the receiving streams. The ponds will be removed when the appropriate sections of the regulations are satisfied.

When the ponds are removed, the affected land will be regraded and revegetated pursuant to the CDMG's regulations, Section 4.05.17 and the approved WFC Reclamation Plan.

Pond 008 was constructed in an area which contained three small stock ponds on the Burbridge property. The landowner has provided a letter stating that he would like Pond 008 to remain to replace the three ponds which existed in the pre-mining condition. This letter is provided in Attachment 2.05.4(2)(C)-4. The demonstration to allow the permanent retention of Pond 008 is included in Attachment 2.05.3(3)-19.

Dam Classification Criteria

The dam classification criteria follows the guidelines of the USDA Soil Conservation Service Technical Release 60 regarding potential for loss of life and damage as a result of dam failure. ~~As of the Mid Term Review of 2006, three designed ponds have not been built. These are pond 010, 011 and 103.~~ This classification criteria is ~~as follows:~~shown below. As of the Permit Revision No. 6, all ponds have been built except for Pond 015.

Class A: No realistic threat of damage to property or life in case of dam failure

Class B: Dams located in predominately rural or agricultural areas where failure may damage isolated homes, main highways or minor railroads or cause interruption of use or service of relatively important public utilities.

Class C: -- Dams located where failure may cause loss of life, serious damage to homes, industrial and commercial buildings, important public utilities, main highways, or railroads.

Special demonstrations are needed for ponds that have Class B or C dams. It is demonstrated below that each of the ponds meets the Class A criteria.

~~Pond 010 - As seen on Map 2.05.3(3)-1 Surface Hydrology, the only buildings or structures which require evaluation are the Enstrom buildings located approximately 700 feet southwest of the pond dam. In case of a dam failure, water would have to drop from the base of dam elevation of 5613' to the low point of the channel, which is 5599' elevation and then rise up to 5615' elevation on the other side of the channel and approximately 700 feet away from the dam. The channel is large and more than enough to handle a dam failure of a pond that is entirely full. This volume is approximately 15 acre feet less 2 acre feet of incision, which is a volume of 13 acre feet, depending upon the flow in the emergency spillway. Once the water goes downstream in the tributary channel, it enters Tuttle Draw a short distance downstream and there are no structures that could be affected by a small volume in Tuttle Draw since it is large enough to handle substantial peak flows, as shown on Map 2.05.3(3)-1. For these reasons, Pond 010 is given a Class A designation.~~

Pond 011 - As seen on Map 2.05.3(3)-1 Surface Hydrology, Pond 011 is located on the ~~same~~ tributary drainage to Tuttle Draw ~~as that described for Pond 010~~. The only buildings or structures which require evaluation are the Enstrom buildings located approximately 670 feet northwest of the pond dam. In case of a dam failure, water would have to drop from the base of dam elevation of 5621' and travel 670' to the northwest but it cannot since the upper reach of the tributary channel is in between the dam and the structures. See Map 2.05.3(3)-14 for details. Water will flow in the channel first and since the maximum flow is only 11.5 acre feet for a full dam break, it is not enough to cause the water to exceed the channel and flow uphill to the Enstrom structures. Once the water goes downstream in the tributary channel, it enters Tuttle Draw a short distance downstream and there are no structures that could be affected by a small volume in Tuttle Draw since it is large enough to handle substantial peak flows, as shown on Map 2.05.3(3)-1. For these reasons, Pond 011 is given a Class A designation.

~~Pond~~Ponds 012 and 013 - As seen on Map 2.05.3(3)-1 Surface Hydrology, ~~Pond~~Ponds 012 and 013 ~~is~~are located immediately outside the floodplain of Tuttle Draw. Any dam break of ~~this~~these ponds would discharge water directly into Tuttle Draw. There is no chance the water could harm anything or anyone at other locations. There are no structures that could be affected by a small volume in Tuttle Draw since it is large enough to handle substantial peak flows, as shown on Map 2.05.3(3)-1. For these reasons, ~~Pond~~Ponds 012 and 013 ~~is~~are given a Class A designation.

Ponds 014 and 015 - These ponds are meant to handle the flow from a 100 year 24 hour event. They are also incised ponds without any real embankment structure. Also, their small volume and location would not result in any damage to property or life. For these reasons, Ponds 014 and 015 are given a Class A designation.

7. Pond 008 through 01~~4~~5 Designs

As shown above for Sediment Pond 007, Tables 2.05.3(3)-1 and 2.05.3(3)-2 list the values of CN and "k" for different soil and vegetation types at the New Horizon Mine. The tables have been revised to address new soils found in the area west of ~~27.00~~2700 Rd

The curve number (CN) and "k" factor for each of the ponds is determined as a weighted average. The undisturbed area curve number and "k" factor information is based on the soils and vegetation information found within Sections 2.04.9 and 2.04.10, respectively, of the New Horizon mine permit application.

The pond volumes are calculated by first using the Curve Number and Runoff Routine within the Hydrology module of the SURVCADD software and then using the USLE sediment storage routine within the Hydrology module of the SURVCADD 2000 software. The LS factors for the USLE are determined from the 3D CAD grid model of the drainage areas for each pond. The water volume is determined from the weighted average CN for the watershed based on the worst case conditions over the life of the mine and the appropriate design storm rainfall. Curve numbers used are from 78 to 90 based on the existing conditions, level of disturbance and the hydrologic soil type of each watershed. Once the required volume of sediment and storm inflow is known, these two are combined to get the total required volume. SURVCADD was then used to design ponds in each location which had the parameters described in the previous section. All ponds were designed to fully contain the 25 year 24 hour event~~ except~~. Pond 01~~0, which was~~5 is designed to ~~safely pass~~contain the ~~25~~100 year 24 hour event~~ through the emergency spillway~~.

Shown on the following two pages are the calculations used by the SURVCADD Program in determining typical pond volumes.

Universal Soil Loss Equation : Use in Survcadd Program

==

Required User Input :

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Note : The following values are to be entered by the user for each area in the watershed. The method for obtaining these parameters is left to the user.

Rainfall Factor (R) : Default = 50;
Erodability Factor (K) : Default = 0.37
C Factor (C) : Default = 0.5
P Factor (P) : Default = 1.0

Geometric Information :

======================

Area (sq units) : Can be entered by the user or the program calculates the area of a user-selected closed polyline. The user also has the option to enter the area in different units.

Slope, S (%) : Can be entered by the user or the program calculates the slope when the user selects an area from the screen.

Length (L) : Can be entered by the user. If the user selects an area from the screen, the length is not calculated since the Gross Erosion is directly calculated.

Topographical Factor (Ls) : Will be calculated from Length (L) and the Slope (S), only when these values are entered by the user directly, as against calculatedby the program from the screen. In the second case, the value of Ls is calculated for individual grids and not for the entire area.

Ls = (L/72.6)^m * ((430*S^2 + 30*S + 0.43)/(6.613))

where L and S are defined above and
m = 0.5 if S=>5%; = 0.3 if S<= 3% ; = 0.4 otherwise.

Gross Erosion, E (tons/acre/year) : Calculated from the above defined parameters for each area defined. If the user selects an area from screen, E is calculated in each grid and the cumulative value is calculated.

$E = R * K * Ls * C * P$, where all the parameters are as defined above

Volume Calculations :
=====================
Required User Input

Sediment Delivery Ratio (DR) : Default = 0.37
Time Period,T (years) : Time of analysis; typically the time of the storm event
Density of the sediment (D) : The post-deposit density of the sediment
Runoff (I) : Calculated from some other routine like Curve Number and Runoff

Total Erosion (E, tons/year) = Sum of (E * Area) for all the areas.
Total Yield (Y, tons/year) = E * DR
Sediment volume per year (Vs) = Y / Density
Total Sediment Volume = Vs * Time period
Runoff Volume = Runoff (I) * Total Area
Total Pond Volume = Runoff Volume + Total Sediment Volume

Pond 008 was constructed in the fall of 2000. Pond 009 was excavated in the spring of 2002. ~~Pond 014 was excavated in the spring of 2004.~~ Ponds 01~~0~~1 through 013 have not yet been constructed. Accordingly, the values for Ponds 008 and 009 are as-builts, and those values for Ponds 01~~0~~1 through 013 are as-designed. Map 2.05.3(3)-6-1 shows the detailed plan views and cross-sections for ponds ~~010,~~ 012 and 013. All ponds will utilize a key cut into the dam and seep collars on the principal spillway pipe as shown on the map. All dams will have a minimum combined slope of 5.0:1.0 and will be compacted in no greater than 8" lifts to 90% of the tested maximum dry density of the material.

8. Small Area Exemptions

As of the ~~Mid Term Review of 2006~~Permit Revision 06, ~~5~~one Small Area Exemption~~s exist or are planned~~ exists in the permit area. ~~Four of these are small areas which cannot drain to the sediment pond system due to lower elevation of these areas. The final one~~This is the disturbed topsoil stripping area in advance of the mining pit. ~~All~~The small area ~~exemptions are~~exemption is designed to meet or exceed effluent requirements according to Rule 4.05.2 and ~~were~~was originally approved for the entire permit area in the year 2000 under Permit Amendment PR-5. The designs for ~~these~~this exemption~~s~~ are shown in Attachment 2.05.3(3)-7 Small Area Exemptions.~~ The areas are also shown on Map 2.05.3(3)-1. No small area exemptions exist on the New Horizon #1 site.~~

9. Discharge Structures

Discharge from the sedimentation pond, diversions and pit dewatering will be controlled by energy dissipators, riprap channels, and other means or devices, where necessary, to reduce erosion, to prevent deepening or enlargement of stream channels, and to minimize disturbance of the hydrologic balance. Discharge structures will be designed according to standard engineering design procedures.

10. Transportation Facilities

Haul Roads

The following describes the design and construction of haul roads at the New Horizon Mine. There will be three separate haul roads which will be utilized throughout the mining of the New Horizon Mine. Please see Map 2.05.3(3)-8 for full detail on the road alignment and profiles for all haulage roads. The names of the four haulage roads which will be utilized can be seen as Northeast Perimeter Haul Road, Southwest Haul Road, and BB West Haul Road. Map 2.05.3(3)-8 additionally shows typical construction cross sections of the haulage roads and shows a table which details the widths of the haulage roads. The Northeast Perimeter Haul Road is as built; the other 2 haul roads are designed widths which will be constructed as mining progresses west of 2700 Road.

The Southwest Haul Road and BB West Haul Road are haul roads within the disturbed area and for this reason do not need to meet the design criteria of Rule 4.03.1(3). Nevertheless, these roads meet the criteria for grades, compaction, drainage, etc. All haul roads at the site are nearly flat in grade and have minimal fills (less than 2 feet high) and basically no cuts.

General Requirements. WFC will construct, maintain and reclaim haul roads to minimize erosion and siltation, air and water pollution and damage to public and private property. To the extent possible, using the best technology currently available, haul roads will not cause damage to fish, wildlife, or related environmental values and will not cause additional contributions of suspended solids to stream flow or to runoff outside the permit area.

Location. At the New Horizon 2 area, haul roads will be constructed on lands proposed to be disturbed by mining and reclamation operations.

Haul roads at the mine site will be designed with appropriate ditches, grades and culverts to control erosion and runoff. All haul roads will be constructed basically "on-grade". Topsoil will be removed and stockpiled in accordance with WFC's topsoil salvage plan. The location will be partially limited by the grades of the existing or postmining areas. Stream fords will not be used during construction of roads unless approval is first obtained from the regulatory authority. The existing and proposed haul road profiles and typical cross section are shown on Maps 2.05.3(3)-8.

Design and Construction. The design of the haul roads incorporate the demand for mobility and travel efficiency, based on the geometric criteria appropriate for the anticipated volume of traffic, weight and speed of the vehicles to be utilized. The design and construction or reconstruction of haul roads not within the estimated disturbed area will be certified by a registered professional engineer, if required by the CDMG for good cause shown.

Should haul roads not within the estimated mining disturbance areas be necessary, they will be designed and constructed or reconstructed in compliance with the following standards in order to control erosion and disturbance of the hydrologic balance.

The vertical alignment of the haul roads will not exceed 10 percent on the overall grade. Maximum pitch grade will not exceed 15 percent, and there will not be more than 300 feet of pitch grade exceeding 10 percent within any consecutive 1,000 feet.

The horizontal alignment will be consistent with the existing and postmining topography and will be coordinated with the vertical alignment to ensure that the roads will not cause excessive environmental damage.

Road cut slopes will not be steeper than 1v:1.5h in unconsolidated material or 1v:0.25h in rock. Embankment fill slopes will not be steeper than 1v:1.5h, except where embankment material is a minimum 85 percent rock. Embankment slopes will not be steeper than 1v:1.35h unless it has been demonstrated to the regulatory authority that embankment stability will result. The minimum safety factor for all embankments will be 1.25.

All vegetation material and topsoil, as determined under 4.06.2, will be removed from beneath the design roadbed, shoulders, and surfaces where associated structures will be placed, and will be stored in accordance with 4.06.3.

Embankments will not be constructed on side slopes steeper than 1v:5h or 20 percent unless the existing ground is plowed, stepped or if in bedrock, keyed in a manner which increases the stability of the fill.

Material used for embankments will be reasonably free of organic material, coal or coal blossom, frozen materials, wet or peat material, natural soils containing organic matter or any other material considered unsuitable for use in embankment construction by CDMG. Excess or unsuitable material from excavations will be disposed in accordance with 4.09.1.

Material for construction of embankments will come from the vicinity of the mining area and will be non-toxic and of a non-acid producing nature.

Material containing, by volume, less than 25 percent of rock larger than 6 inches in greatest dimension will be spread by scrapers or dozers in successive uniform layers not exceeding 12 inches in thickness before compaction.

When the material for an embankment consists of large size rock, broken stone, or fragmented material that makes placing it in 12 inch layers impossible, the embankment will be constructed in uniform layers not exceeding in thickness the approximate average size of the rock used, but the layers will not exceed 36 inches. Rock will be distributed by grading or dozing in a manner that will ensure proper placement in the embankment, so that voids, pockets and bridging will be reduced to a minimum. The final layer will meet the requirements of 4.03.1(3)(d)(v).

Each layer of the embankment will be completed, leveled and compacted before the succeeding layer is placed. Successive layers will be compacted evenly by routing dozers, trucks and scrapers over the entire width of the embankment. This procedure will be continued until no visible horizontal movement of the embankment material is apparent. Embankment layers will be compacted to a minimum of 90 percent of Standard Proctor density or as directed by the engineer to ensure that the embankment is adequate to support the anticipated volume of traffic and weight and speed of vehicles to be used.

Material will be placed in an embankment only when its moisture content is within acceptable levels to achieve design compaction.

Temporary erosion control measures (ditches, berms, straw dikes, silt fence) will be utilized during embankment construction to minimize sedimentation and erosion until permanent control measures can be established. Immediately upon completion, measures will be taken to stabilize all embankments with vegetation cover or other means as approved by the regulatory authority to minimize erosion. Where a vegetation cover is used, consideration shall be given to providing an appropriate growth medium.

<u>Drainage</u>. Each haul road not within areas disturbed by mining and reclamation activities will be designed, constructed and maintained to have adequate drainage using ditches and culverts to safely convey the peak runoff from a 10-year, 24-hour precipitation event while maintaining a minimum of one half foot of freeboard to the top of the road embankment (see Map 2.05.3(3)-1 for typical details of drainage structures).

Drainage ditches will be placed at the toe of all cut slopes formed by the construction of haul roads. Water will be intercepted before reaching a large fill and drained safely away in accordance with the requirements of 4.03.1. Water from a fill will be released below the fill through conduits or in adequately lined channels and will not be discharged onto the fill.

When drainage ditches discharge onto open terrain, a number of measures will be taken to protect the terrain from erosion. When the drainage discharges onto a disturbed area, the area will be revegetated to control runoff. In an area where revegetation would not be sufficient to control erosion, the area will be rip-rapped. Temporary measures to reduce erosion will be employed while the area is undergoing revegetation such as straw dikes, containment ditches, etc. WFC typically constructs ditches on the inside of roadway cuts and safety berms for drainage. As most road cuts are into resistant bedrock-type material, ditches normally do not require lining. Culverts will be designed and installed to minimize the runoff volume conveyed in each ditch. Culverts and ditches will typically be designed using SEDCAD or other generally accepted software to predict the peak runoff and Manning's equation to determine the peak velocity and flow depth.

If the ditch is not stable, then WFC will use a larger ditch section and/or adequately line the ditch in order to comply with applicable regulations.

Drainage from haul roads within the areas disturbed by mining and reclamation activities (see Map 2.05.3(3)-1) will be constructed to meet the requirements of 4.05.2 and such haul roads will at a minimum be constructed and maintained to minimize erosion of the disturbed area. Erosion control measures to be used singly or in combination include but are not limited to:

a. Stabilizing all exposed surface areas to promote a reduction in the rate and volume of runoff;

b. Using straw dikes, riprap, check dams, berms, geotextile materials, mulches, vegetation sediment filters, contour furrows or other measures that reduce overland flow velocity, reduce runoff volume, or trap sediment; or

c. Such other measures to minimize erosion resultant siltation and disturbance to the prevailing hydrological balance.

Culverts will be installed to avoid plugging or collapse and to avoid erosion at the inlets and outlets. Riprap will be installed as necessary to reduce the exit velocity. The minimum width will be the width of the natural downstream channel. The riprap will be sized in the field based on the "as-built" slope of the culvert and final configuration of the exit channel slope area. The sizing shall be based on the Federal Highway Administration's HEC No. 11 "Use of Riprap for Bank Protection" or other standard methods. All pipes will have a minimum cover of 12 inches. Culverts and drainage ditches will be maintained periodically to prevent accumulation of debris on the culverts inlets and outlets.

The following is an outline of the general design procedures used in the design of culverts:

1. Identify the need for a structure from topographic maps, and a visit to the site;

2. Determine the size and hydrology of the watershed in question;

3. Perform SEDCAD, or other acceptable software, computer run to determine the peak runoff from a 10-year, 24-hour precipitation event.

4. Using SEDCAD, or other acceptable software, computer run to determine the proper size of culvert to handle the peak runoff form a 10-year, 24 hour precipitation event. Also check the pipe sizing using the hydrograph of corrugated steel pipe culverts with inlet or outlet control, the discharge quantity, and the amount of entrance head desired.

Other applicable methods of culvert design include the use of charts developed by the Federal Highway Administration, published in Hydrologic Engineering Circular HEC-5 (FHA, 1980), and Hydrologic Design Series HDS-3 (FHA, 1980).

Charts published in HEC-10 (FHA, 1978) are also used; however, exit velocities must then be determined by other methods. Headwater conditions are typically examined by using HEC-5 inlet control nomograph. To be conservative and to allow for adequate freeboard, WFC usually uses "projecting" conditions.

As virtually all culverts have free out falls, inlet control assumptions can be verified by the "Pipe Flow Charts" in HDS-3. If flow in the culvert has a free surface, entrance control exists, and exit velocity can be approximated by using the greater of normal or critical velocity determined by the "Pipe Flow Charts" in HDS-3.

Maintenance. Haul roads will be inspected on a daily work basis at the New Horizon Mine. If, upon inspection, it is determined that repairs are needed, appropriate repairs such as, but not limited to, grading, filling of potholes, replacement of the road surfaces, revegetation of side slopes and watering for dust control, will be conducted as necessary. Magnesium Chloride solution may be utilized to control fugitive dust. The solution will have an approximate concentration of 30% and will be applied at a rate of one-half gallon per square yard of surface area. The solution of Magnesium Chloride will be applied by a commercial company specializing in this product and will be dispensed from a truck with approximate 16 foot spray bars. One-two applications are anticipated per year.

Restoration. Unless WFC requests retention of haul roads for postmining land use and the CDMG approves such request, immediately after the road is no longer needed for operations, reclamation, or monitoring:

a. The road will be closed to vehicular traffic;

b. The natural-drainage patterns will be restored;

c. All culverts will be removed;

d. Roadbeds will be ripped, plowed and scarified;

e. Fill slopes will be rounded or reduced and shaped to conform the site to adjacent terrain and to meet natural-drainage restoration standards;

f. Cut slopes will be shaped to blend with the natural contours;

g. Terraces will be constructed as necessary to prevent excessive erosion and to provide long-term stability in cut-and-fill slopes;

h. The regraded area will be reclaimed in accordance with the approved reclamation plan;

i. Unless otherwise authorized by the CDMG, all road-surfacing materials will be removed, hauled or conveyed and disposed under 4.11.4.

The Northeast Perimeter Haul Road is also in the disturbed area and therefore should not need to meet the design criteria of Rule 4.03.1(3), however, since the area has been reclaimed, an alternative demonstration to the design criteria of Rule 4.03.1(3) is given below.

<u>Alternative Demonstration to the Design Criteria of Rule 4.03.1(3) for the Northeast Perimeter Haul Road</u>

This demonstration is written by Greg Lewicki, P.E., with over 28 years of coal mine haul road design, construction, permitting and reclamation experience.

The plan view and profile of the road on Map 2.05.3(3)-8 The Northeast Perimeter Haul Road was first started in 1993. At that time, the road was installed from Station 0+00 to approximately Station 30+00. In subsequent years, as mining continued to the west, the road was also extended west to its crossing of 2700 Road, which was started in the year 2002. The total road length is 6600 feet. The road was installed by the following sequence:

1) strpping topsoil from the surface area
2) placement of 1' to 2' of compacted fill in lifts adequate for good compaction (using heavy loaders and dozers) and then compacted further with heavy mine trucks
3) placement of 4" of gravel on the surface which was then compacted with very large mine trucks

Although no compaction tests were made of the minor fill, I firmly believe that the compaction is adequate for its intended use for the following reasons:

1) The fills are less than 2 feet high and in most cases, they are less than 1 foot high.
2) The heavy equipment in use at this mine site is capable of producing tremendous compaction in small lifts or even 1 foot lifts.
3) Most of the overburden material used in the fill has a good mix of sand, silt and clay which normally achieves an excellent compaction. This is supported by the excellent strength testing done on the overburden material for the sediment pond stability analyses. See Attachment 2.05.3(3)-15 for details of the strength properties of the overburden.
4) The mine haul trucks which have used the road produce an extremely large point load on the ground surface, further improving the compaction.
5) The road has been in use for 13 years with no problems of any kind regarding stability, compaction and crowning.

6) The profile of the road on Map 2.05.3(3)-8 shows that the majority of the grade is less than 4.0% while only one portion of approximately 280 feet is at a grade of approximately 6.97%. This meets the criteria of Rule 4.03.1(3).
7) All drainage crossings have been designed with culverts to handle the peak runoff from the 10 year 24 hour event. See Map 2.05.3(3)-1 Surface Hydrology and Attachment 2.05.3(3)-1-3 Collection/Diversion Culverts and Ditches for the details of the drainage basins, and the designs of the culverts and roadside ditches. Many of these structures have been in place for many years without any operational problems.
8) Sideslopes of the minor fills are a maximum of 3H:1V slope and are as mild as 5H:1V in some places.
9) The minimal slopes of the minor fills have been vegetated and are extremely stable and do not result in any measurable erosion or damage to the hydrologic balance. As previously stated, the majority of these fills are less than 1 foot in height.
10) The crossing of the reclaimed County Road 2700 and the Northeast Perimeter Haul Road has been specially designed in order to ensure that the County Road does not incur damage as a result of the heavy truck traffic crossing. This crossing was approved by Montrose County in the issuance of the Special Use Permit in 1999. This permit is contained in Attachment 21.05.3(3)-8 County Agreements. The following pages show the details of the construction of the crossing.

The perimeter haul road - 2700 road crossing was designed by Del-Mont Consultants in 2007, and approved by Montrose County the same year. The road was constructed in 2008. Detail drawings and specifications from Del-Mont Consultants can be found in Attachment 2.05.3(3)-8.

Product Description MIRAFI

The Original Geosynthetics Company

product

Mirafi® HP-Series Woven Polypropylene Geotextiles

for Stabilization and Soil Reinforcement Applications

TC Mirafi offers a wide range of woven geotextiles for stabilization and soil reinforcement applications. These geotextiles are cost-effective reinforcement elements which improve and enhance modern construction techniques in a variety of civil engineering applications.

PRODUCT DESCRIPTION

Mirafi HP-Series products are woven geotextiles comprised of high tenacity polypropylene yarns. HP-Series Woven Polypropylene Geotextiles yield ultimate tensile strengths up to 13,200 lbs/ft (machine direction) per ASTM D 4595. The HP-Series products combine the properties of high tensile strength and modulus and high confinement with their ability to act as a filter and separator.

FEATURES AND BENEFITS

- **Strength.** Higher tensile strength at 2% and 5% than any comparable stabilization product;
- **Flow.** Uniform openings provide the same filtration and flow characteristics as that of a fine to coarse sand layer;
- **Soil Interaction.** Excellent soil confinement resulting in greater load distribution;
- **Seams.** Panels can be sewn together in the factory or field, providing cross-roll direction strength to facilitate installation and providing reinforcement strength;
- **Cost.** Woven reinforcement geotextiles provide low cost tensile strength for reinforced soil structures.

APPLICATIONS

Because of their flexibility and versatility, woven geotextiles are used in a variety of applications, including embankments on soft foundations, retaining walls, steepened slopes, and soil stabilization for road and rail construction. Environmental applications include liner support, voids bridging, and reinforcement over soft, hazardous pond closures. For any application where long term design of earth reinforcement structures are involved, HP-Series Woven Polypropylene Geotextiles are a logical choice.

INSTALLATION GUIDELINES*

Site Preparation

Many conditions affect the degree of site preparation required to provide a working surface compatible with the selected geotextile including:

- Foundation subgrade strength and its relation to equipment mobility;
- The presence of a vegetative root mat;
- The need for removal of large trees or other obstacles.

Direct placement of the geotextile on the prepared site is usually preferable. Generally, it is advisable to leave vegetative cover such as grass and weeds in place to provide a support matting for construction activities.

Geotextile Fabrication and Placement Procedures

Placement of geotextiles can be labor intensive process. This time consuming procedure can be simplified by prefabricating geotextile panels before field placement and using experienced field installation and sewing crews.

Installation of the geotextile must conform to the lines and grades as drawn by the engineer. This may require large roll or panel placement, using manual positioning or equipment-assisted deployment.

* These guidelines serve as a general basis for installation. Detailed instructions are available from your TC Mirafi representative.

HP-Series Polypropylene Woven Geotextile

HP-Series Geotextile used in pond closure application

TC Mirafi

3

THE GEOGRID MYTH

Woven Geotextiles—why they really work better!

For subgrade stabilization applications where weak subgrade conditions exist, geogrids are limited in their effectiveness due to their low tensile strength, inability to separate and provide filtration, expensive mechanical connectors, and high cost. In subgrade stabilization applications the product that works best is often a woven geotextile. Woven geotextiles combine the properties of high tensile strength and modulus, and high confinement, in addition to their ability to act as a filter and separator. Woven geotextiles can also be seamed together to create uniform high strength in all directions. In fact, if you look at any subgrade stabilization application, woven geotextiles will always out perform geogrids, technically and economically.

Geogrids (right) allow soft subgrade soils to pump through while woven geotextiles (left) provide separation and filtration.

A Look at the Facts tells you why!

Properties of Mirafi HP Woven Geotextiles Versus Biaxial Geogrids

	Units	MIRAFI HP370	Biaxial Geogrid Type 1		MIRAFI HP570	Biaxial Geogrid Type 2	
			MD	XD		MD	XD
Tensile Strength							
Ultimate	lbs/ft	**2700**	910	1410	**4800**	1278	2188
5% Strain	lbs/ft	**1350**	620	890	**2400**	820	1340
2% Strain	lbs/ft	**540**	300	445	**960**	380	595
Interaction - Ci		**0.8**	0.8		**0.95**	0.8	
Separation/Filtration		**Excellent**	None		**Excellent**	None	

These properties were obtained from published manufacturers' literature and actual test programs.

Technical Comparison – When you look at the key product properties required of a geosynthetic for subgrade stabilization applications—high tensile strength and modulus, high confinement, filtration, separation, and seam strength—HP Geotextiles far exceed those for geogrids in every category.

In every category Mirafi HP woven geotextiles exceed the properties of geogrids, often by a factor of 2 or more. In addition, woven geotextiles provide separation and filtration functions, and can provide multi-directional strengths in excess of 3000 pounds per foot, none of which are possible with geogrids.

Economical Comparison – The material cost of the Mirafi HP woven geotextiles are 20 to 50 percent less than that of the geogrid alone, they are available in wider roll widths and can be seamed together to reduce overlap requirements.

Mirafi HP geotextiles save time and money over geogrids any way you look at it!

THE BOTTOM LINE – While TC Mirafi manufactures both woven and non-woven geotextiles and geogrids, if you need a geosynthetic product for subgrade stabilization applications, we recommend woven geotextiles every time.

CHART 1: HAUL-ROAD STABILIZATION DESIGN CURVES FOR 5,000-LB WHEEL LOAD

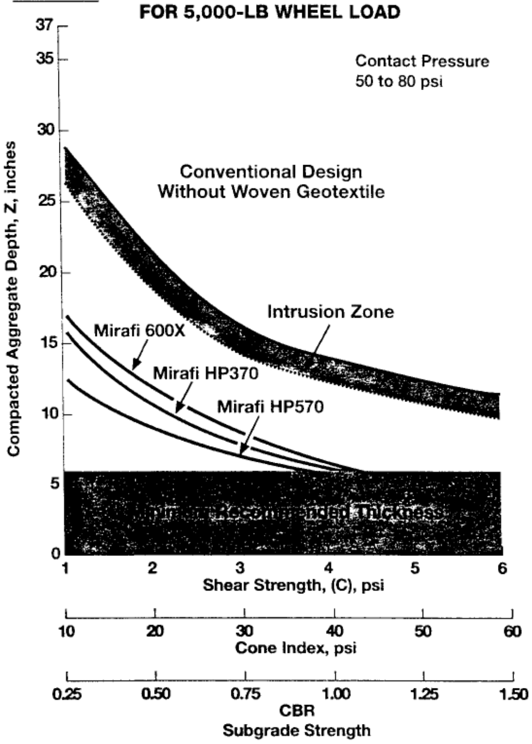


CHART 2: HAUL-ROAD STABILIZATION DESIGN CURVES FOR 10,000-LB WHEEL LOAD

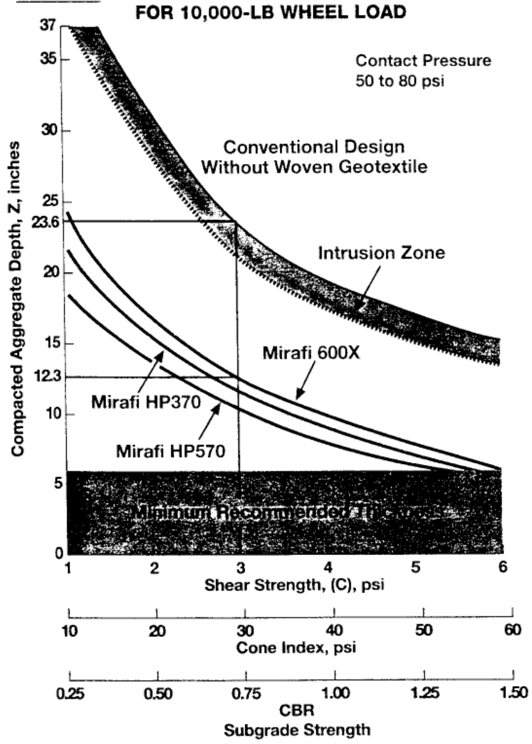


CHART 3: HAUL-ROAD STABILIZATION DESIGN CURVES FOR 15,000-LB WHEEL LOAD

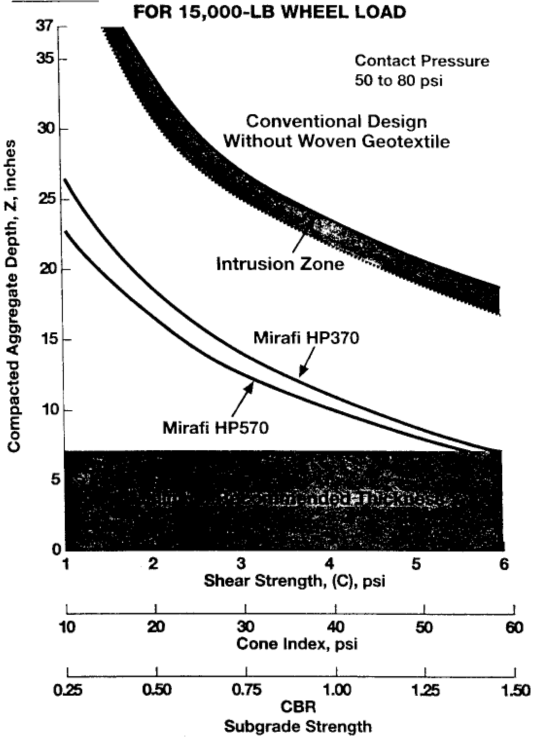
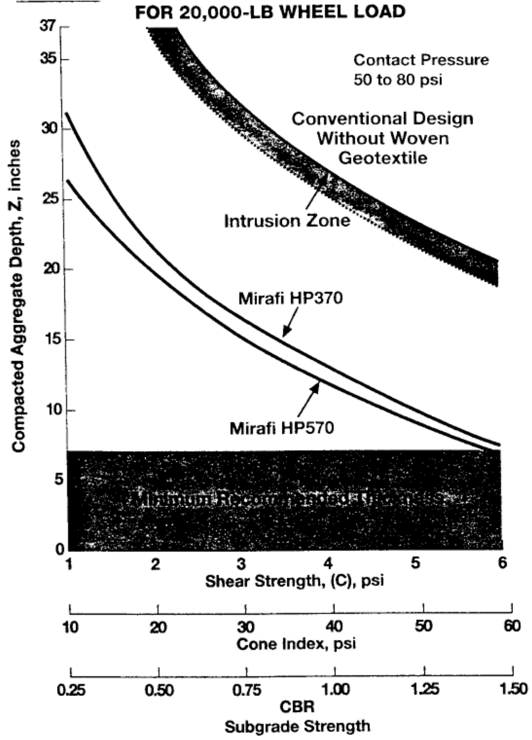


CHART 4: HAUL-ROAD STABILIZATION DESIGN CURVES FOR 20,000-LB WHEEL LOAD



It is my professional opinion that the road meets the design criteria of a minimum static safety factor of 1.3 and is more than adequate for compaction of fills. As shown on Map 2.05.3(3)-8, the road is entirely within the disturbed area of the mine and was adjacent to previously mined pits.

Based on all the items stated above, it is my opinion as a professional engineer qualified in this field of expertise, that the The Northeast Perimeter Haul Road is adequate for its intended use and basically meets all the requirements of Rule 4.03.1(3). The road is extremely stable and does not result in any damage to the environment of any kind. The road will be reclaimed once mining is completed. Please see details of the reclamation in Section 2.05.4.

I certify that the information presented in this demonstration is adequate to the best of my knowledge and belief.

COLORADO REGISTERED
GREGORY C. LEWICKI
20335
PROFESSIONAL ENGINEER

Greg Lewicki
3/26/06

Access Roads

Under the definition of Access Roads provided in Section 1.04 of the Rules, there are no access roads on the site. There are 3 Haul Roads and one Light Use Road in the permit area. The 5th Street Road is a light use road since mine personnel do not use the road every day.

Light-Use Roads

At the New Horizon Mine, light-use roads will only be used on an intermittent basis for purposes other than transportation of coal including, but not limited to, roads used for monitoring and periodic maintenance of monitoring facilities and reclamation areas, intermittent equipment passage from one mine area to another mine area, or other occasional use. The only road that meets this criteria at the mine site is the 5th Street Road. This road is occasionally used to monitor wells, Pond 007 and the mine discharge into Calamity Draw.

In the New Horizon 2 area, there is a single lane dirt road approximately 0.57 miles long which extends to the west of 5th Street Light Use Road (see Map 2.05.3(3)-8). This road is used by the City of Nucla for access to the city sewage lagoon and to one residence. Alternative access has been provided as required by the Montrose County Commissioners. The Montrose County Commissioners granted Peabody (and by succession, WFC) permission to temporarily close this road during mining (see Attachment 2.05.3(3)-8, County Agreement). WFC will reopen the road to meet or exceed the terms of the Montrose County Road Closure Agreement.

All criteria listed below are utilized in the construction of the 5th Street Road.

General Requirements. WFC will construct, maintain and reclaim light-use roads to minimize erosion and siltation, air and water pollution and damage to public and private property. To the extent possible, using the best technology currently available, light-use roads will not cause damage to fish, wildlife, or related environmental values and will not cause additional contributions of suspended solids to stream flow or to runoff outside the permit area. Any such contribution shall not be in excess of limitations of State or Federal law.

The light-use roads at the mine site will be designed with appropriate ditches, grades, and culverts to control erosion and runoff. All light-use roads will be constructed basically "on-grade" and the location will be partially limited by the grades of the existing or postmining areas. Stream fords will not be used during construction of roads unless approval is first obtained from the regulatory authority.

Location WFC will locate light-use roads on ridges or on a stable slope in order to minimize erosion. No part of any light use road will be located in the channel of an ephemeral stream where the upstream watershed is larger than one square mile and in intermittent or perennial streams unless specifically approved by the CDMG. Stream fords of an ephemeral stream when the upstream watershed is larger than one square mile and intermittent or perennial stream will be approved by the CDMG before construction proceeds. All other stream crossings will consist of culverts in flowing streams, consistently wet areas, and in ephemeral channels as necessary to allow passage and to minimize disturbance of the hydrologic balance. Light-use roads will utilize culverts designed to safely pass the 10-year, 24-hour precipitation event. Ditches and drainage control will be established during construction and maintenance of the roads to minimize erosion and to assist traffic passage.

The 5th Street Light Use Road starts on the southeast corner of the permit area and proceeds north along the overburden stockpile and enters the old 5th Street at Station 23+50. The road then continues west to Station 53+80 which is west of Pond 007.

Design and Construction. Light-use roads will be field engineered to follow the existing topography as much as practicable. Topsoil will be removed and stockpiled in accordance with WFC's topsoil salvage plan. The horizontal and vertical alignment will be dictated by the topography and the need to avoid obstructions. Light-use road surfacing material will be adequate for the use of the road. Acid or toxic-forming substances will not be used in the road surfacing. Light-use roads will be maintained to minimize erosion and to allow passage of traffic.

The plan and profile of the 5Th Street Road is shown on Map 2.05.3(3)-8 Mine Roads. As shown on the map, the road is 5380 feet long and actually starts on the southeast corner of the permit area, near Lincoln Avenue, south of 5th Street. As seen in the profile on the same map, the road has a grade of between 0% and 4% grade and an average width of 30 feet.

All temporary drainage crossings are designed for the 10 year 24 hour event and all permanent drainage crossings are designed for the 100 year 24 hour event, as shown on Map 2.05.3(3)-1 Surface Hydrology and Attachment 2.05.3(3)-1-3 Collection/Diversion Culverts and Ditches. The map shows the details of the drainage basins and the Attachment shows the designs of the culverts and roadside ditches.

The same equipment and procedures for compaction that are described in the Demonstration for the NE Perimeter Haul Road were also used for this road. The road has been in place since 1993 without any problems of stability, erosion, puddling, crown problems, or any other issue that could result in damage to the environment. The road is also entirely within the disturbed area of the mine. The road was constructed on grade (with the exception of the Pond 007 Crossing described below) and only minor fills of 1' to 2' height were used. The sideslopes are a maximum of 3H:1V and are well vegetated.

The 5th Street Light Use Road crosses Pond 007 at approximately station 45+00, as seen on Map 2.05.3(3)-8. A professional engineer has prepared a report detailing this section of the road and the embankment stability near Pond 007. The report for this crossing can be found in Attachment 2.05.3(3)9. A pair of 42" CMP's under 5th Street deliver water from the northern section of Pond 007 to the southern section before it is released into Calamity Draw. This crossing has functioned without any problems for approximately 12 years.

<u>Reclamation</u>. The portion of the road that is truly along 5th Street will remain (from Station 23+50 to the end at 53+80. The County has agreed to accept this road into their road system once the mine is reclaimed. This was approved as part of the Special Use Permit in 1999. The portion of the road from 0+00 to 23+50 will be reclaimed according to the procedures described below.

WFC will reclaim a light-use road when it is no longer needed in accordance with the reclamation plan, described in Section 2.05.4. The road will be closed to vehicular traffic. The natural drainage patterns will be restored. All culverts will be removed. Roadbeds will be ripped, plowed or scarified. Cut and fill slopes will be rounded or reshaped and blended into the surrounding topography. Cross drains, dikes or water bars may be constructed to control erosion as required. Road surfaces from which topsoil has been removed will be covered with topsoil and revegetated in accordance with the reclamation plan.

County Roads

Mining and reclamation activities will be conducted within 100 feet of current public roads. However, when blasting or any other mining activities which could create a potential safety hazard are occurring, public access will be prevented and traffic will bypass the specific work area while such activity is being conducted. These activities will be sequenced in a manner to allow public travel through the area on other public roads in the immediate vicinity.

BB Detour Road

As part of the mining operation, portions of BB Road and 2700 Road will be disrupted. Both of these roads are considered collector roads and are administered by Montrose County. Temporary access will be provided by installing a detour along the northern edge of the mining area, which will connect back to 2700 Road north of the mining area. The plan profile for this detour is shown on Map 2.05.3(3)-9 and the cross sections of the road are shown at 100 feet intervals on Map 2.05.3(3)-10.

The timing of the relocation and the restoration is given in Table 2.05.3-10-3. The best location for the main detour was north of the proposed operation and immediately south of Tuttle Draw. Map 2.05.3(3)-9 shows the detour road in plan view, which will provide access for all users north of the site along 2700 Road to and from Nucla. A special access turnout has been provided for the Reeder and Garrett properties. Since the intersection of 2700 Road and BB Road (Sunshine Ranch Corner) will also be removed, all existing users west on BB Road must be provided new access. These users are Enstrom, Johnson and Wilcox. This is to be done by using the existing county road (BB 27) which goes west from 2700 Road approximately 1300 feet south of the Sunshine Ranch Corner and ends at the Morgan house. An extension of this road will be provided to the Enstrom, Johnson and Wilcox properties. These are the only users of the western portion of BB Road who will be affected by the operation. The Morgan extension road will be installed to BB Road as shown on Map 2.05.3(3)-8 Mine Roads. BB Road ends at the Wilcox property which maintains his access. Johnson and Enstrom use their existing driveways from BB Road and then use the Morgan extension to get out to BB 27 Road and then to 2700 Road. BB Road West will be restored as the pre-existing dirt road for reclamation.

The only traffic that will be slightly inconvenienced as a result of mining operations will be that traffic that travels from north of the operation directly south on 2700 Road or in the opposite direction. This is a small percentage of the traffic that uses the BB Road/2700 Road intersection. This traffic would have to use the detour to go to the town of Nucla, approximately 1.0 miles further east. In some cases, the destination of this traffic is somewhere south of Nucla, so there may actually be no additional distance traveled. This detour is expected to be in effect from the time 2700 Road is excavated in mid-2001 until mid-2006 when the road will be replaced with gravel. The following year, the road would be paved in its original location.

BB Road Detour Design Details

A detailed plan with engineering drawings of the detour has been supplied to Montrose County for approval together with the revised special use permit application for the mine in July of 1999. Final approval was granted, and documentation is shown in the Special Use approval in Attachment 2.05.3(3)-8 Montrose County Agreements.

The existing portion of BB Road through the amendment area will be used until mid to late year 2000 when mining will require the use of the detour. The detour will be 4550 feet long and will be installed to the Montrose County Road and Bridge specifications for collector roads. This entails the following items:

1) A right of way of 60 feet (the same as the existing road),

2) 1.25" thickness of chipseal

3) 4" thickness of class 6 roadbase

4) 14" thickness of class 2 pit run gravel where the largest size stone will be 8" in size.

5) Chipseal width of 24.0 feet (same as existing road)

6) Total road width = 26.0 feet

7) 2% grade from centerline to each side

8) 4% superelevation on curves

9) Compaction of all surfaces to 95% AASHTO T 180. Test results throughout the road length will be submitted to the County demonstrating this compaction.

10) Inside road ditch in all cuts which will be at least 1.5 feet deep and 2:1 sideslopes

11) Maximum fill slope - 2.0H:1.0V

12) Maximum cut slope - 1.5H:1.0V

13) Minimum horizontal curve - 200 feet radius. An existing curve immediately north of the detour is less than 100 feet in radius.

14) All vertical curves have a sight distance of at least 140 feet except for the curve at 18+52 which is sharper due to the need to accommodate the crossing of the West Lateral Ditch (pipeline). This grade cannot be changed for pipeline hydraulics.

15) Prior to chip seal, the road surface will be treated with MC-70 or comparable product

16) As seen on the profile on Map 2.05.3(3)-9, the maximum grade of the route is 11.0% in a length of 220 feet from station 28+80 to 31+00. This is the section where the road descends toward Tuttle Draw. The County Engineer preferred the steeper grade in this section over a shorter sight distance.

17) No sections of the roadway or fill are within the 100 year floodplain of Tuttle Draw.

18) Based upon the horizontal curves and superelevation of 4%, the recommended speed of the detour road will be 25 miles per hour which is comparable to that of the existing route. There will be no stop signs or passing lanes for the main route. The existing route has straight road but does have a stop sign and a 90 degree turn. The detour length is 4550 feet while the existing road to get to the same point is 4800 feet in length.

19) In areas where the road drainage must pass from one side to the other, 16" diameter corrugated metal pipes will be placed at approximate 250 feet intervals below the roadway. These installations will follow State Highway Department specifications. Culverts exiting on fill will be protected from erosion by use of riprap or other means.

20) Montrose County has agreed to the plans and has approved of the actual construction based on inspections, reports, etc. Once the road is acceptable, Montrose County will assume the road and will conduct the maintenance. This was done immediately after its installation in the year 2002.

21) Once the detour is abandoned, it will be reclaimed. Chip seal surface will be excavated and stockpiled for use in the permanent construction of BB Road west of the Sunshine Ranch Corner. The exact location of the stockpile area has not yet been determined.

The road was designed using an accurate aerial topographic map, site survey points for the road centerline and Survcadd civil engineering software working inside AutoCad 14. As of the Mid Term review of 2006, the BB Detour Road has functioned well since its installation and when the paved portions of BB Road and 2700 Road are restored, the BB Detour Road will be removed.

Northeast Permimeter Haul Road

Professional engineer certified specifications for this haul road and its intersection with 2700 Road can be found in Attachment 2.05.3(3)-8.

Restoration of BB Road and 2700 Road

Two paved roads will be restored as part of the reclamation of the New Horizon Mine. These are sections of 2700 Road and BB Road and can be seen on Map 2.05.3(3)-16 in both plan view and profiles. Please see Map 2.05.3(3)-13 for the typical section of how these two paved county roads will be restored. Significant compaction of the underlying fill was required by Montrose County prior to re-paving. Montrose County has approved the plans shown on the above mentioned maps as part of the Special Use Permit approved in 1999. This approval is given in Attachment 2.05.3(3)-8 Montrose County Agreements. The plans as shown meet the County road specifications as collector roads.

All permanent drainage structures along these roads have been designed for the peak runoff from a 100 year 24 hour event. These structures are ditches and culverts.

BB Road West of 2700 Road (Enstrom, Wilcox, and Johnson access) will be restored as well, however it will be restored as the dirt road that existed prior to mine disturbance.

Please see Map 2.05.3(3)-8 for details on the typical cross section of BB Road West of 2700 Road, as it will be the same as the haul road. The width of the road in this section will be 27' wide when restoration is completed. A compacted fill surface similar to the pre-existing condition will be restored.

There will not be any special requirements which will be a part of the restoration of the Sunshine Ranch Corner. This intersection will be restored in the same fashion as the adjacent county roads and will be restored to county standards. The only thing special about the restoration of this intersection is that there will be a stop sign in the direction opposing 2700 Road (BB Road), which will allow 2700 Road to be the main through road. There are no special County requirements for the restoration of this intersection.

~~**Table**~~

TABLE 2.05.3(3)-3 ~~Timing of Road~~TIMING OF ROAD, ~~Ditch and Utility Detours and Restorations~~DITCH, AND UTILITY DETOURS AND RESTORATIONS.

Item	Description	Date
1	~~Leave open slot cut immediately south of BB Road while mining west to eastern edge of 2700 RoadEnd 20002Install BB Road Detour as described in Section 8. Also install power and phone lines along this detour road.~~Construct BB Road Detour	~~Finish by 2nd quarter~~ 2000
~~3Mine through BB Road north to West Lateral Ditch. Stock pile asphalt.Mid-20004~~ 2	~~Install~~Installed 26" & 12" pipeline to divert West Lateral Ditch ~~Detour Start~~ around the active mine area east of 27 Rd	200~~1~~2

~~5~~3	~~Install Enstrom, Wilcox, Johnson access road from Morgan roadStart 20026Mine through 2700 Road going west. Stockpile asphalt.Mid 20027Place 2700 Road and BB Road in original locations as a gravel surface. Continue using detour. Restore West Lateral Ditch in permanent pipeline location~~Installed a portion of the 26" HDPE pipe into its permanent location in Section 1-(west of 27 Rd to end of pipeline-Morgan field)	2003
4	Construct BB 27 Detour Rd to Morgan, Enstrom, Johnson, Wilcox	2003
5	Extended the temporary 12" HDPE pipeline further into Section 36 to service James Johnson	2006
	Abandon the temporary 12" HDPE pipeline to Johnson property. No longer needed since WFC exercised its lease agreement.	2007
	Bury the 26 " & 12" HDPE pipeline into its permanent location in Section 31 and connect it to the already permant 26" pipe in Section 1 to completely finish the entire pipeline project.	~~Mid 2005-Mid~~ 2007
6	Finish building 27 & BB East Rd to final graveled grade. The road was opened for Public use and BB Detour Rd was closed. Pavement still needs to be completed for project is finalized.	200~~6~~8
~~8~~7	Pave 27~~00~~ Road and BB Road in original locations and restore Sunshine Ranch Corner intersection.~~ Also lay power~~	Pending, (waiting for a~~nd phone lines~~ contractor to mobilize in ~~original locations. End 2007~~to the area)
9	Remove BB Road detour and reclaim road area	~~End~~ 200~~7~~9
10	Mine west to last cut at western permit boundary	~~End~~ 2013
11	Backfill final cut with overburden stockpile	~~End 2013~~2013-2014
12	Retopsoil and revegetate final cut area	~~Start~~ 2014

13~~-~~	Replace BB Road from Sunshine Ranch Corner to western boundary. ~~Also re-install power lines and phone lines along road.~~	~~Start~~ 2014
14	Continue to irrigate and monitor reclaimed areas until final bond release. ~~Many areas will be given back to the original owners, especially irrigated areas, much earlier than the date shown here.Start 2024~~	2014-Bond Release

As of the Permit Revision 06, the Sunshine ranch intersection has been restored but not yet paved. The BB Road Detour will be reclaimed by the end of 2009, except for the portion on the Benson east property, which will remain at the request of the landowner. A letter from the landowner certifying his desire for the road to remain can be found in Attachment 2.05.3(3)-8.

11. Support Facilities

Buildings. Existing buildings include a cinder block building (16' x 32') to be used as a conference and training facility, a metal shop building (33' x 45') to be used as a warehouse, a cinder block storage building (25' x 90') also to be used for warehousing, a foreman's trailer (10'w x 37'l x 8'h), a parts semi-truck trailer (8'w x 40'l x 8'h), a pre-engineered metal-frame-metal clad repair shop (52' x 85') with outside equipment wash pad, an oil separator that is attached to the wash pad to separate oil from the wash water, a 10'x10' furnace room attached to the north end of the repair shop, a metal-frame-metal clad bath house 24' x 34'), and a fuel and lube oil storage and pump facility consisting of storage vessels contained inside a lined earthen berm that will contain the volume from the largest vessel plus the 10yr-24hr rainfall event, and a frame house (24' x 40') in use as the mine office all located at the New Horizon 2 facilities area. Map 2.05.3-1 shows the locations of the existing buildings.

Details of sizes and types of construction for all buildings are shown in the following table.

TABLE 2.05.3(3)-4 BUILDINGS INVENTORY

Structure Name	General Location	Foundation Type	Foundation Dimensions	Foundation Thickness	Building Construction Type	Building Height	Comments
~~OFFICE~~Office	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	~~STEM WALL~~Stem Wall	25 ~~x~~X 39	N/~~A~~a	~~WOOD FRAME CONSTRUCTION~~Wood Frame Construction	12FT	This building was a home when the mine started and was remodeled to and office. It wil be converted back to a home after mining is finished and will be left. No bond money for demolition is required.
~~ENCLOSED WAREHOUSE~~Enclosed Warehouse	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	~~MONOLITHIC CONCRETE SLAB~~Monolithic Concrete Slab	32 ~~x~~X 47	4-6 ~~INCH~~Inch	~~CINDER BLOCK/WOOD FRAME~~Cinder Block/wood Frame	12FT	This structure was an enclosed building/garage before mining and will be left as same after mining. No bond money for demolition is required.
~~OPEN WAREHOUSE~~Open Warehouse	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	~~MONOLITHIC CONCRETE SLAB~~Monolithic Concrete Slab	24 ~~x~~X 90	~~4-6INCH~~4-6inch	~~WOOD FRAME CONSTRUCTION~~Wood Frame Construction	12FT	This structure was an open building/garage before mining and will be left as same after mining. No bond money for demolition is required.
~~CHANGE HOUSE~~Change House	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	T~~IE DOWN~~ie down	14 ~~x~~X 60	N/~~A~~a	~~TRAILER ON FOUNDATION~~Trailer on Foundation	12 FT	This structure was new at the start of the mine. It would be a benefit to the land owner as a storage building. Worst case would be that it be towed away and sold.

~~SHOP~~Shop	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	~~MONOLITHIC CONCRETE SLAB~~Monolithic Concrete Slab	52 ~~x~~X 76	6-12 ~~INCH~~ ~~a~~Inch Average	~~METAL FRAME CONSTRUCTION~~Metal Frame Construction	40 FT	Plan is to leave this structure as an enclosed farm equipment storage facility for the land owner. No bond money for demolition is required.
~~FOREMAN'S TRAILER~~Foreman's Trailer	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	T~~IE-DOWN~~ie down	10 ~~x~~X 37	N/~~A~~a	~~TRAILER ON FOUNDATION~~Trailer on Foundation	12 FT	This structure was new at the start of the mine. It would be a benefit to the land owner as a storage building.. No bond money for demolition is required.
~~TRAINING BUILDING~~Training Building	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	~~STEM WALL~~Stem Wall	21 ~~x~~X 32	N/~~A~~a	~~CINDER BLOCK/ WOOD FRAME~~Cinder Block/ Wood Frame	12FT	This building was a home when the mine started and was remodeled to and office. It will be converted back to a home after mining is finished and will be left. No bond money for demolition is required.
~~STEEL SHIP CARGO CONTAINER~~Steel Ship Cargo Container #1 (~~FILTER STORAGE~~Filter Storage)	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	~~NONE~~None	8 ~~x~~X 40	~~NONE~~None	~~STEEL SHIP CARGO CONTAINER~~Steel Ship Cargo Container	8FT	Brought on site in 2005 and set on level ground next to Enclosed Warehouse. . It would be a benefit to the land owner as a storage building. No bond money for demolition is required.
~~STEEL SHIP CARGO CONTAINER~~Steel Ship Cargo Container #2	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	~~NONE~~None	8 X 20	~~NONE~~None	~~STEEL SHIP CARGO CONTAINER~~Steel Ship Cargo Container	8FT	Brought on site in 2005 and set on level ground next to Shop. It would be a benefit to the land owner as a storage building. No bond money for demolition is required.

~~STEEL SHIP CARGO~~Steel Ship Cargo ~~CONTAINER~~Container #3	~~OFFICE~~Office ~~SHOP COMPLEX AREA~~Shop Complex Area	~~NONE~~None	8 X 20	~~NONE~~None	~~STEEL SHIP CARGO CONTAINER~~Steel Ship Cargo Container	8FT	Brought on site in 2005 and set on level ground next to Shop. It would be a benefit to the land owner as a storage building. No bond money for demolition is required.

See Attachment 2.05.3(3) for land owner letters.

Waste Water. Sewage from the existing and proposed buildings will be disposed of through proposed and existing sanitary sewer lines discharging into a sewer main on Lincoln Street which is owned by the Nucla Sanitary District. Waste water from the equipment wash will be re-circulated and reused; however, if there is any excess waste water, it will be run through a sediment trap and an oil water separator and discharged to Pond 007 via a natural drainage and the 007 East Ditch.

Domestic Water. Potable water will be provided through a water line tied into the Town of Nucla water system.

Solid Wastes. Solid waste will be picked up by the local waste disposal contractor for disposal in the Montrose County Sanitary Landfill. The land fill is privately owned and operates under the regulations mandated by the State of Colorado and Montrose County. Solid wastes not suitable for disposal at the landfill will be transported to and disposed of in suitable, licensed facilities under the applicable Federal and State regulations. When practicable, solid wastes will be separated for recycling.

Explosive Storage. No explosive storage facilities are contemplated for the New Horizon Mine. Blasting will be carried out by a licensed independent contractor who will own and maintain explosive storage facilities off-site and transport explosives to the mine site as needed. The contractor may maintain small field magazines on the mine site, but no explosives will be stored at the mine overnight.

Fuel Storage. Three above-ground fuel tanks will be utilized. Two tanks of approximately 12,000 gallons capacity will be used for diesel storage and a tank of approximately 1,000 gallons capacity will be used for gasoline storage. One of the diesel tanks and the gasoline tank are located at the fuel and lubricant storage and dispensing facility proximal to the truck shop. The second diesel tank is located near the pit to facilitate fueling for trucks and loader. This tank is mounted on skids so that it may be advanced as needed to remain near the active mine area. Both sets of tanks are enclosed by berms and have spill prevention and safety protection devices as mandated by the appropriate regulatory authorities. Spill prevention and containment measures will be implemented under the New Horizon Mine Spill Prevention Control and Counter-measure (SPCC) Plan.

Coal Handling Structures. WFC has no existing or proposed coal handling structures. The coal from the mine pit is hauled in highway trucks to the power plant for processing and use.

Support Facilities and Utility Installations. All support facilities used in connection with the operation of the mine, including but not limited to, mine buildings, equipment storage facilities, sheds, shops and other buildings will be designed, constructed or reconstructed and located to minimize or control erosion and siltation, water pollution and damage to public or private property.

Services which run through, pass over, or under the permit area, consisting of power, sewage, water, and telephone lines, and wells will be protected against damage or relocated to prevent or minimize the disruption of service.

Irrigation System. An electric irrigation pump is located in Calamity Draw, near Pond 007. It pumps water into an aluminum or PVC pipe system that distributes water to several side roll sprinkler systems. A second irrigation pump station has been established along the north permit boundary to furnish additional irrigation water to the irrigation system, see Map 2.05.3-1 for locations. This irrigation system will enhance the revegation on the irrigated pastureland portion of the final reclamation.

All information on topsoil and overburden stockpiles are given in Section 2.05.4.

12. Special Features

Pit Turn Slot Cut. A 115 ft wide slot cut of is needed on the east side of 27.00 Road as mining proceeds north to the outcrop from the year 2000-2003. The west slope of the slot cut will be near vertical since it will be a highwall. The east slope of the slot cut will be the angle of repose of the backfill, which is approximately 40 degrees. The 115 feet wide distance is the opening at the bottom of the cut. The slot will begin approximately 630 feet south of the intersection of BB Road and 27.00 Road and will extend about 920 feet north of the intersection. The total length of the slot cut is about 2330 feet. This open "turn" slot is necessary to allow for a safe truck-shovel working area and for the overburden push dozer(s) to dump their spoil off the coal edge when the mining operation turns from the southern end of the BB Detour Road and advances westward. Map 2.05.3(3)-2 shows a typical cross section of the Pit Turn Slot Cut. WFC plans on making up the deficit backfill volume this cut will create when it mines west of 27.00 Road and the overburden depth increases. WFC anticipates that by the end of 2004 the slot cut will be backfilled, graded and topsoiled by the normal ongoing mining processes. At that point a revision for bond reduction will be proposed. As of the Mid Term Review of 2006, the slot cut has been mined through and reclaimed. No future slot cuts are planned for the operation.

Exploration Drill Holes The New Horizon Mine coal reserves are based on approximately 115 boreholes drilled between the mid-1980's and 2004. The bulk were drilled by Peabody Coal Company in the 1980's with Western Fuels - Colorado (WFC) drilling about 55 holes from 1993 to 2004. Occasionally, WFC needs to drill infill holes within the existing array to make more certain of its' reserve estimations concerning various mining parameters such as coal quality, coal and overburden thickness, etc. WFC anticipates that from the year 2003 and onward such infill holes will occasionally be needed. See Attachment 2.05.3(3)-10 for details.

~~Temporary~~ Relocation ~~for CC Company~~of the CCC West Lateral Ditch

~~T~~An agreement between the Colorado Cooperative Company ~~has operated an irrigation ditch known as the~~(CCC) and Western Fuels Colorado was reached in 2001 to install a primary 26" HDPE pipeline and a secondary 12" HDPE pipeline to temporary divert and distribute approximate 38cfs of water to the lawful water share owners while mining through the original West Lateral Ditch ~~to irrigate lands in the area for many decades. With the mines advance to the north though BB Road, this ditch needs to be diverted. Since the temporary detour route involves rises and dips, a pipeline must be used. The plans enclosed in this document show the detailed design of the pipeline temporary route and the permanent relocation.~~

~~After evaluation of all alternatives, it is believed that a high density polyethylene (HDPE) pipeline is the best choice for the temporary and permanent routes. Although expensive, we feel that this design will best suit the long term needs of the CC Co.~~

~~In April, 1999, the mine was operating in cuts 40-45 as shown on Map 2.05.3-1. This encompasses the full operation sequence from topsoil stripping to overburden blasting, removal, coal removal, backfilling and soil replacement. A temporary open cut will be left south of BB Road and a detour will be built for BB Road in preparation for the crossing of BB Road in mid-2000. Mining will proceed north on the Martin and Benson properties until the outcrop is reached south of the BB Road detour. This will occur sometime in mid 2003. In order to balance the low overburden cuts near the outcrop, cuts 66-69 may be taken on the west side of 2700 Road while mining northeast of the Sunshine Corner (intersection of BB Road and 2700 Road).~~

~~The portion of ditch to be replaced begins near the eastern portion of the Martin property and ends at the ditch crossing of 2700 Road. This distance is approximately 4616 feet with an elevation drop~~

~~of 77 feet. This is an average grade of 1.67%. The ditch will be disrupted in early 2002, therefore the temporary route will need to be installed prior to this time. Installation would be undertaken well in advance of the irrigation season to ensure that the system is fully functional when it is needed.~~

~~The logical location for the temporary route is south along the east side of the Martin property, then in a curve on the reclaimed area below BB Road and then west to meet the existing ditch immediately before it enters the existing culvert under 2700 Road. This is a distance of approximately 3800 feet. Review of the final contours in the existing reclaimed area shows that there is a rise in the reclaimed land along the temporary route, thus it is not possible to put the temporary route in as an open ditch. For this reason, some type of pipeline is needed. The Reeder/Garret/Johnson takeoff will be supplied by smaller pipe that will leave the main pipe near the exit and continue north along 2700 Road to the existing distribution box.~~

~~Once mining moves west of 2700 Road and the area is restored to its~~ located within the permit boundary. After the land was reclaimed, the same pipelines was reinstalled into the approximate original ~~contour, the temporary line can be moved into the permanent location in the winter of 2004-2005. The permanent pipeline will be ready for use in the irrigation season of 2005.~~

~~WFC has received approval from the CC Company~~ROW of the original open ditch. Gate valves and mechanical flow meters were installed at agreed upon locations along the pipeline so each land owner could meter their shares of water out of one or the other or both of the two main pipelines. It was decided and agreed upon that a big benefit of keeping the pipelines as a permanent structure across the final graded reclamation was that leakage of water from an open ditch through disturbed ground would be eliminated, plus it would give the down stream water users some pressure to better irrigate their land with. As of 2007, the 26" & 12" HDPE pipelines had been permanently buried in their final resting place, which is approximately in the same ROW as the original ditch. The CCC is happy with the work and as of early 2010, a signed easement for the ~~pipeline.~~

~~Design Details~~

~~1) The pipeline will be a continuous fused polyethylene pipe of 28 inch outside diameter with no joints that will roll with the terrain. This pipe is the best choice for tough applications and long term durability.~~

~~2) The pipe wall thickness of 1.33 inches is resistant to weather and wear and will remain flexible. The polyethylene material is made to last indefinitely.~~

~~3) Other specifications: 80 psi rating (more than adequate), inside diameter 25.33 inches, length of approximately 4000 feet.~~

~~4) The pipe has excellent flow characteristics and will handle 25 cfs during the 6 years of temporary installation and will pass 38 cfs for~~pipelines from each land owner needs to be filed. WFC is working on this detail. All users seemed to be happy with the permanent installed pipeline.

A 12" HDPE pipeline, with three takeouts, will be installed along BB Road west of 2700 Road to provide irrigation water for the Lloyd, Benson, Morgan, and WFC properties on that side of the mine.

The location of the pipeline structure on Map 2.05.3(3)-1 Surface Hydrology is the permanent location. ~~All takeoffs for irrigation in the permanent line will be based on a main pipe flow of 38 cfs.~~

~~5) Each takeoff will have a valve and weir for control and measurement of the outflow.~~

~~6) The pipe is extremely durable and will avoid many pitfalls of other pipe types.~~

~~7) The temporary pipe will be laid on the surface while the permanent pipe will be buried. The permanent line will not interfere with any post-reclamation land uses.~~

~~8) A pressure regulator will be placed in the line near the exit to control flow in the entire pipe.~~

~~9) During the temporary pipe time frame, the Reeder/Garret/Johnson distribution box will be supplied from an 8" diameter SDR 26 pipe leading from the main pipe.~~

~~Timing~~

~~1) Temporary pipe will be laid during sometime in 2001 and will be put into operation either during for the latter part of the irrigation season of 2001 or will be ready for the 2002 season. This will depend on mining advance.~~

~~2) After mining continues west of 2700 Road and the area for the permanent line has been backfilled and graded, the permanent line can be installed and should be ready for the 2005 irrigation season.~~

~~As of the Mid Term Review of 2006, the HDPE pipeline was installed as described above and has operated with no significant problems. All ditch users are satisfied with the performance of the pipeline. The location of the pipeline is shown on Map 2.05.3(3)-1 Surface Water Hydrology. Two buried portions also exist, one under the BB detour Road and one under the future restored BB Road and the mine perimeter road. Both of these locations are shown on the Surface Hydrology Map. It is important to note that the CC Company has accepted the pipeline as a permanent structure. The location of the pipeline structure on Map 2.05.3(3)-1 Surface Hydrology is the permanent location.~~

Relocation of Utilities

Electric

When the mining operation crosses BB Road, the buried phone line and overhead power line along it will be relocated to the BB Detour Road. The buried phone line and overhead power line along 2700 Road will be temporarily located along the Morgan access road located south of the property. Once 2700 Road is restored, the utilities will be restored in this permanent ROW as well. The phone lines are under the control of Nucla - Naturita Telephone Company and the power line is owned and operated by San Miguel Power Association. The locations of the original utilities, as well as the relocated utilities, are shown on Map 2.05.3(3)-3. The following table summarizes the distances of power and phone lines that were removed and relocated.

As of January 2010, the mining operations has advanced west of 27 Rd. New overhead electric lines were installed and put into service in 2009, along side the newly constructed 27 Rd in the permit boundary and leading to Second Park homes. As well, the temporary buried power lines paralleling BB Detour was abandon that formally serviced Second Park residence. The buried power line that paralleled BB 27 Rd, from Patty Morgan's home to Frank Morgan's house is still in use and San Miguel Powers plan is to leave it as the permanent installation. As of now, the buried power line continues around the edge of BB 27 Rd to the Enstrom families. When mining is finished on the WFC/Johnson property, a new overhead electric line will be constructed along the newly constructed BB West Rd, starting at BB/27 Rd intersection and going west to service the Enstrom families. When this is complete, the temporary buried power line from Frank Morgan's home to BB West Rd will be abandon. The old overhead line that was located west of 27 & BB Rd intersection to approximately the start of the BB Detour Rd will not be needed or constructed according to San Miguel power.

Telephone

As of January 2010, a permanent telephone line was plowed in adjacent to BB Rd East, starting near the start of BB Detour Rd and went to BB/27 Rd intersection. Then the telephone line was extended north, along side 27 Rd toward Tuttle Draw Bridge, where it was reconnected to the existing telephone lines servicing Second Park. The temporary telephone line that was plowed in next to BB Detour Rd was abandon at this time. The telephone line that was installed in 2003 to service Patty, Mike, Frank Morgan and Enstrom's is still in service and will remain as the permanent telephone line to these four families. As with the electric service, a new telephone line will be plowed in along side BB West Rd to service the Enstrom families. This will start at BB/27 Rd intersection and go west along side BB West Rd. As with the electric utilities, when this line is installed, the temporary telephone line from Frank Morgan's home, adjacent to BB 27 Rd, will be abandon.

TABLE 2.05.3(3)-5 Overhead Power and Buried Phone Relocations			
Location	Distance (ft)	Where and When Replaced	Timing of Restoration
27~~00~~ R~~oa~~d south of BB Rd Intersection	760	~~Temporarily placed on Morgan Road2008 when 2700 Road is repaved~~From BB/27 Rd intersection, south along 27 Rd, to mine permit boundary. Temporary removed until mining and 27 Rd are reconstructed.	Electric - overhead lines were permanently installed in 2009 for this section. Phone line was permanently rerouted and plowed in along side BB Rd, east of 27Rd.
27~~00~~ R~~oa~~d north of BB Road Intersection	2174	Electric & Phone- Temporarily placed on BB Detour Road	~~2008 when 2700 Road is repaved.~~ Electric- overhead lines were permanently installed in 2009 for this section. A new phone line was buried along side 27 Rdthis area as well.
BB R~~oa~~d east of 27~~00~~ R~~oa~~d Intersection	2285	Temporarily placed on BB Detour Road	~~2008 when 2700 Road is repavedBB Road west of 2700 Road~~San Miguel Power has no plans for re-establishing the power lines. Once the overhead lines were installed along 27 Rd in 2009, they no longer needed the BB Detour buried line to Second
BB Rd west of 27 Rd Intersection	3400	Temporarily placed on ~~Morgan~~BB 27 R~~oa~~d	201~~2~~4 when area is reclaimed

Generally, these lines parallel the roads and are relocated and restored with them. All restored phone and power lines will be buried. WFC has been working with San Miguel Power Co. and Nucla Naturita Telephone Company regarding the relocations and replacements. The plans for all relocations and restorations have been agreed and will be designed, contracted and installed by both utility companies. WFC will reimburse the utilities for the cost of the work.

~~**Attachment 2.05.3(3)-1**~~

~~**Collection/Diversion Ditches and Culverts Design Parameters**~~

~~**Attachment 2.05.3(3)-2**~~

~~**As Built Calculations of Pond 007**~~

~~**Attachment 2.05.3(3)-3**~~

~~**Typical Soil Grain Size Analysis**~~

~~**Attachment 2.05.3(3)-4**~~

~~**Pond 008 As-Built**~~

~~**Attachment 2.05.3(3)-5**~~
~~**Pond 009 As-Built**~~

~~**Attachment 2.05.3(3)-6**~~

~~**Ponds 010 & 013 As Designed**~~

~~**Calculations**~~

~~**Attachment 2.05.3(3)-7**~~

~~**Small Area Exemption**~~

~~**Attachment 2.05.3(3)-8**~~

~~**County Agreement**~~

~~**And**~~

~~**Montrose County Road Easement Agreement**~~

~~**Attachment 2.05.3(3)-9**~~

~~**Rockfill Embankment Specifications**~~

~~**5TH Street Road**~~

~~**Attachment 2.05.3(3)-10**~~

~~**Exploration Drill Holes**~~

~~**Attachment 2.05.3(3)-11**~~

~~**Pond 014 Storm Volume Calculations**~~

~~Attachment 2.05.3(3)-12~~

~~Sediment Pond 012 Engineering Design~~

~~**Attachment 2.05.3(3)-13**~~

~~**Pond 012 As Built**~~

~~Attachment 2.05.3(3)-14~~

~~Pond 011 Engineering and Hydrologic Design Engineering and Hydrologic Design~~

~~**Attachment 2.05.3(3)-15**~~

~~**Pond Slope Stability Analyses**~~

~~**Attachment 2.05.3(3)-16**~~

~~**Demonstration For Retention of Pond 007**~~

~~**Attachment 2.05.3(3)-17**~~

~~**WFC Letter to Retain All Buildings and Structures in Table 2.05.3(3)-4**~~

~~**Attachment 2.05.3(3)-18**~~

~~**NPDES Discharge Permit**~~

~~**Attachment 2.05.3(3)-19**~~

~~**Demonstration for Retention of Pond 008**~~