RIO GRANDE RESOURCES

April 3, 2014

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MINING & MINERALS DIVISION

David L. Clark
Program Manager, Ecologist
Mining and Minerals Division
New Mexico Energy, Minerals & Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Subject: Transmittal Letter – Errata and Addenda for Revision 1 of the April 2013 Mt. Taylor Mine Closeout Closure Plan and Revision 1 of the Application for Revision of Mine Permit to Active Status

Dear Mr. Clark,

Transmitted with this letter are the digital pdf files of the Errata and Addenda for Revision 1 of the April 2013 Mt. Taylor Mine Closeout Closure Plan and Revision 1 of the Application for Revision of Mine Permit to Active Status. Six paper copies and two CD's of the errata and addenda will be mailed to you.

The errata and addenda text (ERRATA and ADDENDA 0314.pdf) includes descriptions of the other files included in this submittal, all of which respond to comments on Rev. 1 (November 2013) received from MMD, NMED and other agencies. The errata are corrections to the Rev. 1 documents, and the addenda contain additional information or clarifications requested in agency comments.

All comments from MMD, NMED and others are addressed in this submittal except for the statement of intent for retention of mine facilities for post-mining land use. That statement has been prepared for signature by the Sandoval estate trustees after review by RGR legal counsel, presently in progress. Once signed, a copy of the statement will be submitted under separate cover to MMD. The statement document should be kept confidential to respect the privacy of the signators.

Please contact me with any questions.

Joe Lister
Mine Manager Mt. Taylor Mine
Rio Grande Resources Corporation

CC: David L. Mayerson, Mining Environmental Compliance Section, Ground Water Quality Bureau New Mexico Environmental Department, 1190 St. Francis Drive N2300, PO Box 5469 Santa Fe. New Mexico 87502

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ADDENDUM #1

3/5/2014

APPLICATION FOR REVISION OF MINE PERMIT #C1002RE FROM STANDBY TO ACTIVE STATUS AND MODIFICATION OF GROUND WATER DISCHARGE PERMIT DP-61, MT. TAYLOR MINE, SAN MATEO, NEW MEXICO

REV.1, NOVEMBER 2013

Rio Grande Resources submits the following additional information on this date, 3/4/2014, to the New Mexico Mining and Minerals Division (MMD) and to the New Mexico Environment Department (NMED) Mining Environmental Compliance Section to provide clarifications, explanations, and details in response to questions and comments on the Revision 1, November 2013 application.

The following questions were posed to RGR, and responses given by RGR, during meetings with NMED and MMD on 2/17/14.

1. How will RGRC control dispersion of contaminated materials prior to closeout activities of the April 2013 CCP?

   <u>RGR response:</u> *Apart from the pond basins, from which sediments will be removed to the waste pile disposal cell at reactivation, and the waste pile, which will be reshaped and partially cover upon reactivation, the site soils have relatively low levels of contamination from ore spillage and wind dispersion. RGR intends to control dispersion of these soils by application of water and/or soil binder, limitation of routes for vehicle traffic, and a new truck wash facility as part of the new ore pad. Recent (2012) surveys show that soil contamination does not extend beyond the limits of ground surface controlled by RGR.*

2. Identify the township and range of discharge pipeline and Outfall 001.

   <u>RGR response:</u> *Figure 1-3 shows the location of the pipeline and the sections along its route. The outfall is located on the Fernandez land grant; therefore, it has no township/ range designation. It is located at state plane coordinates N1601020, E2780747 (NAD 83) at elevation 7088 ft or latitude 35 24 00.62 N, longitude 107 38 23.43 W.*

3. NMED raised concern (ref. Sections 2.7, 3.2.2, 3.4.1.4 Rev 0) about cracking of a clay liner (specifically in the south storm water pond) when dry, and questioned why RGR proposed a different liners (clay) for the storm water ponds near the waste piles versus HDPE liner for the north storm water pond (ore pad runoff pond).

   <u>RGR response</u>: The *ore pad runoff pond's function has changed from just storm water collection to capture of both rainfall runoff and truck wash water from the ore pad,*

which will result in frequent or continuous water discharge to that pad and standing water in the pond. The south storm water pond will receive only precipitation runoff, which history shows will be infrequent, and water stands for only short periods.

NMED indicated a preference for a geosynthetic liner on the south stormwater pond, but RGR has identified drawbacks to a geosynthetic liner for that application including:

- *The liner will be dry and fully accessible most of the time, vulnerable to inadvertent damage, especially punctures of the liner membrane that could be difficult to see. Geosynthetic liner damage is not self-healing. Therefore, foot and vehicular traffic cannot be tolerated on a geosynthetic liner.*
- *If accumulated sediment in the pond needs to be removed, the pond must hold standing water for the sediment to be pumped out. Otherwise, when the sediment is dry (the typical condition), attempts to remove the sediment mechanically could puncture the liner membrane.*
- *Geosynthetic membranes are made to be UV –resistant, but typically the portion of the liner prevents leakage is under water (impoundments) or buried (landfills) and thus protected from UV rays. Prolonged exposure to sunlight will degrade the HDPE, perhaps enough to cause leakage.*

Note that the ponds in the mine water treatment area will have geosynthetic liners, but these ponds are intended to have standing pools of water that will provide UV protection to the submerged liners.

The clay liner proposed for the south stormwater pond was selected over a geosynthetic liner because:

- *A clay liner is not as susceptible to damage as a geosynthetic liner and is more likely to be self-healing. Foot and vehicular traffic can be tolerated on a clay liner.*
- *A clay-liner pond can be cleaned out, if needed, when it is dry without likelihood of damage. If damage to the clay liner does occur, it can be readily repaired.*
- *A clay liner can be augmented, if needed, with additional layers or sealant materials such as bentonite.*

In the application and subsequent responses to NMED comments, RGR referred to the 2012 Kleinfelder report on the characterization of the waste pile and surrounding area. That report demonstrated that the depth of contamination in the soil below the existing south storm water pond, which is unlined, is very shallow and there is no saturated zone between the pond bottom and the perched water addressed in the abatement plan. The perched water was shown to be a relic of sewage lagoon operated only during mine development and now buried below the waste pile; there is no natural shallow ground water to be protected in this location. These conditions show that there has been no migration of contaminants from the storm water pond to ground water. Therefore, a new liner in that pond is not necessary to correct an existing contamination problem; it is being proposed by RGR as an <u>additional</u> protection against potential future infiltration of contaminants from the pond.

In discussion with NMED about a clay liner, NMED staff indicated concern that a clay liner would crack due to desiccation, then leak. RGR responded that, if native clay does not have sufficient swell potential to close desiccation cracks, sodium bentonite will be added to the native clay to increase swell potential and the liner's ability to close cracks when wetted. The clay liner's resistance to cracking can be further enhanced by placing a 6-12 inch layer of common fill (local native soil) over the clay liner to protect it from desiccation and to provide a source of soil fines to fill any cracks that might form in the liner.

NMED also indicated its concern about leaving a head of water on the clay liner that would provide hydrostatic pressure to drive seepage through liner cracks. NMED suggested that RGR consider a system to remove storm water and pump it to the mine water treatment ponds. RGR considers this to be a constructive suggestion that could be implemented within the storm water drainage design proposed for mine reactivation. RGR can install a pump-back system in the storm water pond that will consist of:

- *An electric motor and pump mounted on a floating platform in the pond.*
- *A flexible pipe from the pump to mine water treatment pond #2, routed through, or in the same trench as, the new culvert along the south side of the county road and the existing 48" pipe from that culvert to pond #2.*

The pump would be equipped with a sediment screen and activated by a stationary level switch. The pump intake would be within the top one foot of water, allowing it to avoid drawing in heavier sediments.

4. NMED's comment on section 3.4.1.4 calls for methods for monitoring and removing sediments in all ponds.

    RGR response: Sediment levels in clay-lined storm water ponds will be visible for direct measurement by permanent depth gauge most of the time, since the ponds will be dry most of the time. Sediment can be removed, if necessary, by mechanical excavation. In the MWTU ponds the design capacities will accommodate sediments accumulated over the mine life cycle. Periodic soundings of depths to solids can be made with a plumb line. If sediment removal is necessary, it can be accomplished with a vacuum truck that would then discharge to a disposal cell on the waste pile.

5. Section 2.3 raised a question with NMED regarding use of the septic system during mine operations.

    RGR response: The septic system is for sanitary waste only, during standby. For reactivation of the mine the sanitary treatment plant will be placed back in operation.

6. Section 3.1 comment regarding assurance of removal of radium from mine water before discharge.

    RGR response: Per the NPDES permit, treated water is sampled from a sampling port in the discharge pipeline on the mine site, which is 4.3 miles from the Outfall. Radium will be removed from the mine water using barium chloride as described in the revision *application and tested in accordance with the NPDES permit, as it always has. Z-88 will not be used.*

7. Section 3.1 comment regarding effectiveness of the mine water treatment unit in removing other possible constituents.

    RGR response: *There are no site–specific data regarding the removal of contaminants other than uranium, radium and gross alpha because the levels of other constituents have been below water quality limits. Should such treatment be needed in the future, existing technologies and media are available. Prior to resumption of mine dewatering, RGR will work with NMED to craft a permit condition to sample and test the mine water to establish as updated water quality baseline, from which the need to treat for removal of other constituents can be determined.*

8. Section 3.1.1 comment regarding assurance that numerical water quality standards will be met for other constituents, including selenium.

    RGR response: *RGR had responded previously that the water quality standards for discharge of treated water are covered by the NPDES.*

    RGR's statement contained in Revision 1 of the application is repeated here:

    "Treated mine water sample collection, testing, and reporting procedures are those required under NPDES permit, Part I, Section A.2 and in Section 6.3 of the Application. These will be included in the MPO. The parameters specific to the discharge from outfall 01A, sampled by the Collins sampler, are tested with the following preferred methods:

    pH – EPA Method 150.2; ATSM D5128

    Flow – Venturi or turbine meter

    Total Suspended Solids – ASTM D5907

    BOD – EPA Method 405 1

    The parameters are measured and recorded daily."

9. Section 3.4.4.1 and Drawing MT13-AC-14, clarification about drainage channels. Submit a figure that identified important mine features.

    RGR response: *See the drainage feature identified by note 5 on Drawing MT13-AC-14. The major mine units are identified on several figures and drawings. Figure 2-1a will be added to identify the specific facilities within the service and support area, including the two shafts.*

10. Section 6.3 – No comment written but NMED pointed out that this section calls for daily sampling and testing of treated water for radium, etc. but that the radium test takes 30 days.

RGR response: RGR clarifies the quoted text by acknowledging that radium is a 30-day test, so the results of each day's sample will not be available on the day the sample is collected.

11. Section 6.4 - NMED commented that RGR should repair or replace a liner in which the leakage rate exceeds the pump-back capacity.

RGR response: A pond liner cannot be replaced without taking the liner off line for an extended period. All HDPE liners leak, and leak location and repair while the pond remains in operation are standard practice. Under extreme conditions, any of the ponds can be taken off line, one at a time, if this is necessary for repair.

12. Section 6.5.1- NMED comment regarding modifying table DP61-RAI1.1a to identify the depressurizing well phases.

RGR response: See Figure 1-4 and Table 1.1 of Rev 1 for well descriptions. Wells coded PL are phase I, TH/D are phase II, and W are phase III.

13. Questions regarding the IX resin loading and capacity, specifically the apparent confusion between maximum loading capacity and the expected maximum loading during operations and the difference in loading between the lead columns and the tail columns.

RGR response: These questions have nothing to do with discharges or releases of water from the IX plant, only with the internal operational characteristics of the IX columns. The IX plant is within the jurisdiction of the Radiation Control Bureau (RCB), not the GWQB.

RGR must amend its radioactive material license issued by the Radiation Control Bureau (RCB) to once again allow for operation of the IX Plant. The RCB requires license applicants to specify the maximum amount of licensed radioactive material that will be possessed at any one time. To ensure that RGR would not exceed the corresponding maximum possession limit for natural uranium (that will be specified by the RCB in the license), RGR used the Fluor Fernald study to determine the maximum theoretical mass of uranium that could be possessed at any one time. Hence, RGR based its requested possession limit of 2700 pounds (845.77 millicuries) on the 0.27 lbs/ft^3 Fluor Fernald loading factor.

Using the engineered designs and the maximum flow rates, RGR has predicted, with the aid of modeling software for DOWEX 21K 16/20 resin, that the 30 ppb limit will actually be reached at 0.06 lbs/ft^3 in the seven lead columns and 0.002 lbs/ft^3 in the seven tail columns. The actual resin loading and efficiency will be determined with discharge water sample analysis.

The 0.06 lbs/ft^3 in the seven lead columns and 0.002 lbs/ft^3 in the seven tail columns represent target loading values for resin change-out during operation. At these loading values, the actual maximum possession under the radioactive material license issued by the RCB is predicted to be 365.6 pounds (114.52 millicuries). The full evaluation is provided in Item 5 of the RCB license amendment application.

14. NMED wants to have documentation of radium removal by barium chloride.

    RGR response: The mine water treatment processes are described in Section 2.2.2. Monitoring and testing are described in the NPDES permit and in Section 6.3. The on-site testing laboratory will be reactivated before dewatering resumes. Daily water samples will be sent to a contract laboratory for radium testing if the on-site laboratory is not equipped to perform EPA Method 903.1using a Lucas cell. Alternatively, the new method developed by the Georgia Tech Research Institute's (GTRI) Environmental Radiation *Center (ERC), and recently approved by the EPA, may be used, either in the on-site lab or by an off-site contract lab.*

    See response to question #4 of NMED's request for additional information dated 6/6/13 for details about the chemistry of the treatment to remove radium.

15. NMED inquired about how RGR would respond to increasing selenium concentrations in the mine water.

    RGR response: If the required daily tests for selenium show an increase of selenium approaching the limit, one or more of the IX columns within the excess capacity of the IX plant will be dedicated to selenium removal, using a resin specific to that function.

16. NMED requested a description of the initial dewatering pumping and treatment program for mine reactivation.

    RGR response: A detailed dewatering and mine water treatment plan will be incorporated in the Mine Plan of Operations, which will be prepared once the mine permit has been revised to active status. The main elements and sequence will be:

    - *Rebuilding of the MWTU ponds, including liners*
    - *Rehabilitation of wells*
    - *On-site laboratory setup*
    - *Installation of pumps and collection pipes*
    - *Collection and testing of mine water for updated water quality baseline*
    - *Phase I dewatering – Pt. Lookout wells discharging to MWTU for operational readiness checks of liners and treatment facilities.*
    - *Phase II dewatering and MWTU operation*
    - *Phase III dewatering and shaft dewatering, MWTU operation*

17. MMD and NMED asked for additional explanation for RGR's design of the south waste pile disposal cell clay liner.

<u>RGR response</u>: RGR considered both the operational objectives and the closure objectives in selecting a clay liner for the disposal cells that would receive pond sediments both upon activation and upon closeout. Currently, conventional practice tends to favor a geosynthetic liner (HDPE) because it is essentially impermeable, except for punctures and seam leaks, and installs quickly. However, HDPE is susceptible to punctures and tears from rocks, heavy equipment, or even foot traffic. An HDPE liner is not readily modified once installed, making it operationally less adaptable to changes in waste volume. The dimensions of the waste cell must be set and the containment berm system constructed completely before an HDPE liner can be installed. Moving pond sediment from the pond locations to the HDPE-lined disposal cell requires multiple handling of pond sediments from point of origin to cell placement (excavate-load-haul-dump-spread, each with different equipment) with human health exposures (radiological and dust) in each step. The dump and haul activities pose risk of damage to an HDPE liner.

A compacted clay liner has attributes that fit the proposed application on the waste disposal cell especially well. A clay liner can be constructed incrementally and extended easily because the berm system and liner do not have to be completed before the placement of waste can begin, making the clay-lined cell adaptable to changes in waste volume and expansion as needed. The clay liner uses locally available soil that can be augmented with bentonite (which swells when contacted by water) if needed for reduced permeability. A clay liner is not readily damaged by rocks or heavy equipment, and any damage can be quickly and easily repaired. The clay liner will be constructed using the same soil types used for the cover, so there will be no interface discontinuities with the cover. Moving pond sediment from the pond locations to the clay-lined disposal cell requires less handling of pond sediments from point of origin to cell placement (excavate-load-haul-dump by scraper in a single step, then spread with a dozer) with less risk of human health exposures.

The waste pile has been in place without a liner under it or a cover over it for more than 30 years. The Kleinfelder study (2012) showed that there has been no leaching of contaminants from the waste pile to the perched water plume below it and that there is no saturation front infiltrating through the pile. Therefore, it is very unlikely that pond sediments placed on the waste pile would release contaminants to the ground water, even without a liner under or cover over the cell. The abatement plan and the Kleinfelder study have demonstrated that the only ground water under the waste t depths shallower than the Pt. Lookout aquifer is a local plume, a relic of agricultural and mine development activities that ceased more than 35 years ago and not a natural or reliable water resource. RGR proposes to place a clay liner under the waste disposal cell *and a clay liner over the cell, providing additional protection to this plume or any other potential ground water in the area.*

18. MMD request for description of how mine water sediment is generated and handled.

<u>RGR response</u>: Sections 2.2 and 3.1 of the application for revision of the mine permit to active status describe the physical layout and general movement of mine water through the mine water treatment unit (MWTU). Mine water during the initial dewatering period moves into the wells under high gradient and velocities, bringing fine sediment with it. The sediment is silt and clay size particles from the water-bearing formations and the well filter packs. The rate of sediment discharge drops as hydraulic gradients and pumping rates decline. Therefore, the highest rate of sediment discharge to the ponds occurs early in the dewatering process.

Mine water discharges from the wells and shafts (from which most water is eventually pumped) is collected through a system of pipes and discharged to pond #1 after addition of a flocculant. Acid is added to adjust pH as the water passes into pond #2. Virtually all of the suspended solids in the mine water are settled into ponds #1, 2 and 3. Barium sulfate sludge is precipitated in pond #4, 5, and 8. Essentially no sediments reach ponds # 6 and 7.

During mine operations, the capacities of the rebuilt and lined ponds should be sufficient to contain all sediments generated for the remainder of the mine life. However, if necessary, a vacuum truck will remove pond sediment for disposal in the waste pile disposal cell.

Upon cessation of mining, the water left in the MWTU ponds will be evaporated and the remaining sediments will be excavated and placed, along with the liners, in the closure disposal cell on the waste pile, as shown on Drawings MT13-CL-09 and -10 of the 2013 CCP, Rev.1.

APPLICATION FOR REVISION OF MINE PERMIT #C1002RE FROM STANDBY TO ACTIVE STATUS; MODIFICATION OF GROUND WATER DISCHARGE PERMIT DP-61, MT. TAYLOR MINE, SAN MATEO, NEW MEXICO, REV.1, NOVEMBER 2013; and

CLOSEOUT/ CLOSURE PLAN APRIL 2013, REV.1, NOVEMBER 2013

ERRATA AND ADDENDA

March 2014

ERRATA - Application for Permit #C1002RE Revision and DP-61 Modification

Section 6.4 and Table 6.2

RGR reviewed Table 6.2 and concluded that, although the calculations behind the tabulated quantities were mathematically correct, the format of the table was confusing and the quantities were based on a generalization that was un-conservative. The original calculations used a simplifying assumption, a generalization that an average 1.0 foot depth of water would represent the head of water acting on the entire bottom liner, without taking into account the slope (gradient) of the liner across the pond bottom. When the liner gradient of 1% is considered, a 1.0 foot of head can result from leakage that accumulates over only that part of the liner within 100 ft. (1% grade) of the LDCS pipe. Therefore, the revised ALR is calculated from the amount of water that would need to be pumped from the geonet layer via the sump within a 100-foot radius of the LDCS pipe to keep the hydrostatic head on the bottom liner from exceeding 1.0 feet at any point. In this case the level of the water in the pond, the pond pool, is no longer relevant – only the head within the geonet acting on the bottom liner affects the ALR. Table 6.2 (attached) has been revised in a simplified format to account for the effect on the ALR of the pond bottom slope.

The ALRs in Table 6.2 are likely to change with the final design of the ponds and will reflect the as-built slope of the liner. The ALRs listed in Table 6.2 are best estimates until construction is complete. Leaks will be repaired if leakage rates appear to approach those listed in the revised Table 6.2. Sump pumps will have more than enough capacity to handle the actual discharge requirements to keep the hydrostatic heads on the bottom liner within the 1.0 foot limit. Ponds can be water-tested for leaks using the initial (Phase I) well water from the Pt. Lookout aquifer, which meets discharge standards without treatment.

Figure 1-4

On this figure, the letters A and B mark the locations of wells SM-24-38 and SM-24-43, respectively. These letters were used because the proximity of these wells to each other and the limited space for labeling in the vicinity of the 24 ft. shaft.

Figure 1-6

The location of observation well OBW 24-85 has been corrected to Section 24 and the Well SM31-l -2D has been corrected to Section 31.

Appendix A coversheet

The corrected coversheet is attached.

Drawing MT13-AC-03

Two coordinates labeled N 1580500 on both the east and west margins of the drawing have been corrected.

Drawing MT13-AC-06A detail C

The thickness of the lower geomembrane has been corrected to 40 mils.

Appendix E

Figure RGR RAI-3.2 refers to the Outfall 001 Work Plan, attached to the Summary Report of Pipeline Outfall Investigations. Figure RGR RAI-3.2 is a preliminary version of Figure E-2 in the Summary Report. To avoid confusion, the Summary Report file folder without the Work Plan has been attached. The relevant contents of the Work Plan are incorporated in the Summary Report.

ADDENDA - Application for Permit #C1002RE Revision and DP-61 Modification

Section 2.2

RGR will contact NMOSE District 1 to determine if RGR must file an application for a mine dewatering permit for diversion amounts that may exceed existing water rights. To date, RGR has located some records of historical diversions of ground water by the previous owners, Gulf and Chevron. RGR will continue to search for additional records. RGR has located a limited number of well and pumping data from the Gulf-Chevron ownership period but will also continue to search for those records, as well.

Mine water discharges from the wells and shafts (from which most water is eventually pumped) is collected through a system of pipes and discharged to pond #1 after addition of a flocculant. Acid is added to adjust pH as the water passes into pond #2. Virtually all of the suspended solids in the mine water are settled into ponds #1, 2 and 3. Barium sulfate sludge is precipitated in pond #4, 5, and 8. Essentially no sediments reach ponds # 6 and 7.

During mine operations, the capacities of the rebuilt and lined ponds should be sufficient to contain all sediments generated for the remainder of the mine life. However, if necessary, a vacuum truck will remove pond sediment for disposal in the waste pile disposal cell.

Upon cessation of mining, the water left in the MWTU ponds will be evaporated and the remaining sediments will be excavated and placed, along with the liners, in the closure disposal cell on the waste pile, as shown on Drawings MT13-CL-09 and -10 of the 2013 CCP, Rev.1.

Section 2.2.2

Monitoring and testing are described in the NPDES permit and in Section 6.3. The on-site testing laboratory will be reactivated before dewatering resumes. Daily water samples will be sent to a contract laboratory for radium testing if the on-site laboratory is not equipped to perform EPA Method 903.1 using a Lucas cell. Alternatively, the new method developed by the Georgia Tech Research Institute's (GTRI) Environmental Radiation Center (ERC), and recently approved by the EPA, may be used, either in the on-site lab or by an off-site contract lab.

The initial maximum pumping rate of 12,000 gpm is based on pump capacity and does not mean that would be the actual pumping rate. In the initial dewatering, a substantial volume of water will come from the Pt. Lookout aquifer, which can be discharged directly to Outfall 001 without treatment or used on site for construction water. Consequently, the 10,000 gpm will limit the rate of discharge only from the Phase II and III wells from the deeper aquifers, from which the water will require treatment.

Section 2.2.4

Figure 1-3 shows the location of the pipeline and the sections along its route. The outfall is located on the Fernandez land grant; therefore, it has no township/ range designation. It is located at state plane coordinates N1601020, E2780747 (NAD 83) at elevation 7088 ft. or latitude 35 24 00.62 N, longitude 107 38 23.43 W.

Section 2.3

The septic tank and leach field are used only during standby and only for sanitary waste. The sewage treatment plant will be activated to support mining operations.

Section 2.4

Before removing the sewage treatment sludge for off-site disposal, RGR will test the sludge for the list of metals required by the receiving disposal facility, yet to be determined. The volume of sludge in previous operations was never great enough to require disposal, so RGR has no historical test data for reference. However, the water used for drinking, laundry, and sanitary needs is drawn from the Pt. Lookout aquifer, so the background metals of sewage water reaching the treatment plant are below drinking water limits.

Section 2.7

The ore pad runoff pond's function has changed from just storm water collection to capture of both rainfall runoff and truck wash water from the ore pad, which will result in frequent or continuous water discharge from that pad and standing water in the pond. The south storm water pond will receive only precipitation runoff, which history shows will be infrequent, and water stands for only short periods.

Section 3.1

Apart from the pond basins, from which sediments will be removed to the waste pile disposal cell at reactivation, and the waste pile, which will be reshaped and partially covered upon reactivation, the site soils have relatively low levels of contamination from ore spillage and wind dispersion. RGR intends to control dispersion of these soils by application of water and/or soil binder, limitation of routes for vehicle traffic, and a new truck wash facility as part of the new ore pad. Recent (2012) surveys show that soil contamination does not extend beyond the limits of ground surface controlled by RGR.

A detailed dewatering and mine water treatment plan will be incorporated in the Mine Plan of Operations, which will be prepared once the mine permit has been revised to active status. The main elements and sequence will be:

- Rebuilding of the MWTU ponds, including liners
- Rehabilitation of wells
- Installation of new IX equipment
- Rehabilitation of barium chloride circuit
- On-site laboratory setup
- Installation of pumps and collection pipes
- Collection and testing of mine water for updated water quality baseline
- Phase I dewatering – Pt. Lookout wells discharging to MWTU for operational readiness checks of liners and treatment facilities.
- Readiness test of MWTU systems
- Phase II dewatering and MWTU operation
- Phase III dewatering and shaft dewatering, MWTU operation

Treated mine water is sampled from a sampling port in the discharge pipeline on the mine site, which is 4.3 miles from the Outfall, and tested in accordance with the NPDES permit.

There are no site–specific data regarding the removal of contaminants other than uranium, radium and gross alpha because the levels of other constituents have been below water quality limits. Should such treatment be needed in the future, existing technologies and media are available. Prior to resumption of mine dewatering, RGR will work with NMED to craft a permit condition to sample and test the mine water to establish an updated water quality baseline, from which the need to treat for removal of other constituents can be determined.

RGR will reactivate process controls to achieve the required quality of discharged water, primarily with its on-site laboratory that will include Inductively Coupled Plasma (ICP), GC mass spectrometry, and Kinetic Phosphorescence Analysis (KPA). Samples will be collected and tested daily, weekly, or quarterly in the on-site laboratory according to NPDES and DP-61 requirements, with sample splits sent weekly to monthly to outside contract labs for QC testing. Daily samples for radium testing will be sent to a contract lab unless this capability is installed on site.

Section 3.1.1

The IX plant is within the jurisdiction of the Radiation Control Bureau (RCB). RGR must amend its radioactive material license issued by the Radiation Control Bureau (RCB) to once again allow for operation of the IX Plant. The RCB requires license applicants to specify the maximum amount of licensed radioactive material that will be possessed at any one time. To ensure that RGR would not exceed the corresponding maximum possession limit for natural uranium (that will be specified by the RCB in the license), RGR used the Fluor Fernald study to determine the maximum theoretical mass of uranium that could be possessed at any one time. Hence, RGR based its requested possession limit of 2700 pounds (845.77 millicuries) on the 0.27 lbs/ft^3 Fluor Fernald loading factor.

Using the engineered designs and the maximum flow rates, RGR has predicted, with the aid of modeling software for DOWEX 21K 16/20 resin, that the 30 ppb limit will actually be reached at 0.06 lbs/ft^3 in the seven lead columns and 0.002 lbs/ft^3 in the seven tail columns. The actual resin loading and efficiency will be determined with discharge water sample analysis.

The 0.06 lbs/ft^3 in the seven lead columns and 0.002 lbs/ft^3 in the seven tail columns represent target loading values for resin change-out during operation. At these loading values, the actual maximum possession under the radioactive material license issued by the RCB is predicted to be 365.6 pounds (114.52 millicuries). The full evaluation is provided in Item 5 of the RCB license amendment application.

The IX plant floor will be sealed with a coating of water-proof elastomeric polyurethane such as Polibrid 705 or approved equivalent material.

Treated mine water sample collection, testing, and reporting procedures are those required under NPDES permit, Part I, Section A.2 and in Section 6.3 of the Application. These will be included in the MPO. The parameters specific to the discharge from outfall 01A, sampled by the Collins sampler, are tested with the following preferred methods:

pH – EPA Method 150.2; ATSM D5128

Flow – Venturi or turbine meter

Total Suspended Solids – ASTM D5907

BOD – EPA Method 405 1

The parameters are measured and recorded daily.

Section 3.1.2

In the MWTU ponds the design capacities will accommodate sediments accumulated over the mine life cycle. Periodic soundings of depths to solids can be made with a plumb line. If sediment removal is necessary, it can be accomplished with a vacuum truck that would then discharge to a disposal cell on the waste pile.

On every pond the operating pool will be more than 2.0 feet below the pond impoundment crest. The operating pool is the water level at the invert of the pond outlet or the top of the outlet control weir, whichever is higher.

The MWTU and storm water ponds are all below grade with berms less than 10 feet high and, therefore, non-jurisdictional with respect to Dam Safety Regulations. RGR will confer with OSE District 1 about Section 19.26.2.15 NMAC compliance.

Section 3.2.1

RGR considered both the operational objectives and the closure objectives in selecting a clay liner for the disposal cells that would receive pond sediments both upon activation and upon closeout. Currently, conventional practice tends to favor a geosynthetic liner (HDPE) because it is essentially impermeable, except for punctures and seam leaks, and installs quickly. However, HDPE is susceptible to punctures and tears from rocks, heavy equipment, or even foot traffic. An HDPE liner is not readily modified once installed, making it operationally less adaptable to changes in waste volume. The dimensions of the waste cell must be set and the containment berm system constructed completely before an HDPE liner can be installed. Moving pond sediment from the pond locations to the HDPE-lined disposal cell requires multiple handling of pond sediments from point of origin to cell placement (excavate-load-haul-dump-spread, each with different equipment) with human health exposures (radiological and dust) in each step. The dump and haul activities pose risk of damage to an HDPE liner.

A compacted clay liner has attributes that fit the proposed application on the waste disposal cell especially well. A clay liner can be constructed incrementally and extended easily because the berm system and liner do not have to be completed before the placement of waste can begin, making the clay-lined cell adaptable to changes in waste volume and expansion as needed. The clay liner uses locally available soil that can be augmented with bentonite (which swells when contacted by water) if needed for reduced permeability. The clay liner will be compacted to not less than 95% maximum dry density per the Standard Proctor test, ASTM D-698, so that it can resist the subsequent heavy equipment traffic. RGR intends to use the abundant clay soils available on site for disposal cell liner construction. These soils are identified and characterized in the closeout/ closure plans of 2012, Rev. 1 and 2013, Rev.1. The clay soils are classified according to the Unified Soil Classification System as low-moderate plasticity clay (CL) to clayey sand (SC) with some high plasticity clay (CH). These soils will also be used for the disposal cell and waste pile covers. The activation disposal cell will be covered when all activation waste has been placed in the cell.

A clay liner is not readily damaged by rocks or heavy equipment, and any damage can be quickly and easily repaired. The clay liner will be constructed using the same soil types used for the cover, so there will be no interface discontinuities with the cover. Moving pond sediment from the pond locations to the clay-lined disposal cell requires less handling of pond sediments from point of origin to cell placement (excavate-load-haul-dump by scraper in a single step, then spread with a dozer) with less risk of human health exposures.

The waste pile has been in place without a liner under it or a cover over it for more than 30 years. The Kleinfelder study (2012) showed that there has been no leaching of contaminants from the waste pile to the perched water plume below it and that there is no saturation front infiltrating through the pile. Therefore, it is very unlikely that pond sediments placed on the waste pile would release contaminants to the ground water, even without a liner under or cover over the cell. The abatement plan and the Kleinfelder study have demonstrated that the only ground water under the waste to depths shallower than the Pt. Lookout aquifer is a local plume, a relic of agricultural and mine development activities that ceased more than 35 years ago. This plume does not represent a natural or reliable water resource. RGR proposes to place a clay liner under the waste disposal cell and a clay cover over the cell, providing additional protection to this plume or any other potential ground water in the area.

Natural volunteer vegetation exists on all soils in the mine area, demonstrating the suitability of these soils as growth media. To further document soil suitability, RGR has collected and tested at least 20 samples of potential borrow soil from the locations identified in the application as primary borrow sources. RGR selected 26 soil samples to cover the existing borrow piles, the berms around the MWTU ponds, the area north of Marquez arroyo where extensive additional borrow soil is available, the berm and cut slopes around the south storm water pond, and the shaft muck portion of the south waste pile. RGR believes this distribution of the sampled locations provides a representation of likely borrow sources for backfill, liner and cover soil. Actual sample locations are shown on Figure D.3.5--1.

The soil samples were tested for elements and other parameters listed in tables 1 and 2 of MARP Guidelines, Attachment #1, as specified by MMD in its letter to RGR dated 3/11/2014. The results of those tests are documented in Table D.3.5. In general, these tests show that the surficial site soils, which constitute the majority of the borrow soils, rate "good" to "fair" on MARP suitability. Most of the soils will need nitrate amendment, which is already accounted for in the closure cost estimates. The shaft muck soils (WP series) were not surficial soils and were excavated during shaft sinking. WP soil is marginal for vegetated cover material and would be used for liner construction or blended with other soils for covers.

Section 3.2.1 describes several purposes of RGR's proposed test plot program. An additional purpose of the test plot on the disposal cell at the south waste rock pile is to measure uptake of radium and uranium in plants that establish on the test plot

Section 3.3

The reconfigured ore pad will have a larger footprint that the existing pad and can hold substantially more ore, but 60,000 tons is likely to be well above the amount of ore on the new pad at any given time, so 60,000 tons is the likely limit.

Section 3.4.1.4

RGR intends to use a clay liner, instead of a geosynthetic liner, for the south storm water retention pond for the following reasons:

- The liner will be dry and fully accessible most of the time, vulnerable to inadvertent damage, especially punctures of the liner membrane that could be difficult to see. Geosynthetic liner damage is not self-healing. Therefore, foot and vehicular traffic cannot be tolerated on a geosynthetic liner. If accumulated sediment in the pond needs to be removed, the pond must hold standing water for the sediment to be pumped out. Otherwise, when the sediment is dry (the typical condition), attempts to remove the sediment mechanically could puncture the liner membrane.
- Geosynthetic membranes are made to be UV –resistant, but typically the portion of the liner that prevents leakage is under water (impoundments) or buried (landfills) and thus protected from UV rays. Prolonged exposure to sunlight could degrade the HDPE, perhaps enough to cause leakage.
- A clay liner is not as susceptible to damage as a geosynthetic liner and is more likely to be self-healing. Foot and vehicular traffic can be tolerated on a clay liner.
- A clay-liner pond can be cleaned out, if needed, when it is dry without likelihood of damage. If damage to the clay liner does occur, it can be readily repaired.
- A clay liner can be augmented, if needed, with additional layers or sealant materials such as bentonite.

The 2012 Kleinfelder report on the characterization of the waste pile and surrounding area demonstrated that the depth of contamination in the soil below the existing south storm water pond, which is unlined, is very shallow, and there is no saturated zone between the pond bottom and the perched water addressed in the abatement plan; there is no natural shallow ground water to be protected in this location. These conditions show that there has been no migration of contaminants from the storm water pond to ground water. Therefore, a new liner in that pond is not necessary to correct an existing contamination problem; it is being proposed by RGR as an additional protection against potential future infiltration of contaminants from the pond.

RGR recognizes the potential for a clay liner to crack when desiccated. If native clay does not have sufficient swell potential to close desiccation cracks, sodium bentonite will be added to the native clay to increase swell potential and the liner’s ability to close cracks when wetted. Alternatively, the clay liner’s resistance to cracking can be enhanced by placing a 6-12 inch layer of common fill (local native soil) over the clay liner to protect it from desiccation and to provide a source of soil fines to fill any cracks that might form in the liner.

In the event that the clay liner develops cracks, when it is inundated by runoff that might infiltrate through the cracks, RGR will minimize the amount of water that could infiltrate by installing a pump-back system to remove storm water and pump it to the mine water treatment ponds. This system will consist of:

- An electric motor and pump mounted on a floating platform in the pond. The pump would be equipped with a sediment screen and activated by a stationary level switch. The pump intake would be within the top one foot of water, allowing it to avoid drawing in heavier sediments.

- A flexible pipe from the pump to mine water treatment pond #2, routed through, or in the same trench as, the new culvert along the south side of the county road and the existing 48" pipe from that culvert to pond #2. The design of this piping will be optimized during mine reactivation.

Sediment levels in clay-lined storm water ponds will be visible for direct measurement by permanent depth gauge most of the time, since the ponds will be dry most of the time. Sediment can be removed, if necessary, by mechanical excavation.

Section 3.4.4.1

Figure 2-1a has been added to identify the specific facilities within the service and support area, including the two shafts, as well as the drainage courses. Also see note 5 on Drawing MT13-AC-14.

Section 6.3

RGR will reactivate process controls to achieve the required quality of discharged water, primarily with its on-site laboratory that will include Inductively Coupled Plasma (ICP), GC mass spectrometry, and Kinetic Phosphorescence Analysis (KPA). Samples will be collected and tested daily, weekly, or quarterly in the on-site laboratory according to NPDES and DP-61 requirements, with sample splits sent weekly to monthly to outside contract labs for QC testing. Selenium levels have never exceeded NMED standards, but RGR expects selenium levels to increase gradually over time. If selenium concentrations appear to be approaching the limits in Table 6.1, RGR will activate IX treatment for removal of selenium. Daily samples will be sent to a contract lab for 30-day radium testing unless this capability is installed on site.

Section 6.4

An HDPE pond liner cannot be replaced without taking the liner off line for an extended period. All HDPE liners leak, and leak location and repair while the pond remains in operation are standard practice. Under extreme conditions, any of the ponds can be taken off line, one at a time, if this is necessary for repair.

Section 6.5.1

See Figure 1-4 and Table 1.1 of Rev 1 for well descriptions. Wells codes "PL" are phase I, "TH/D" are phase II, and "W" are phase III. Wells designated D-W straddle phases II and III.

Section 6.5.2

Although the abatement plan requires monitoring of wells WP-4, WP-5, MW-4 and MW-5, RGR intends to monitor all shallow alluvial monitor wells, even after completion of the abatement plan, to document any changes in the alluvial ground water conditions of the site during mining operations.

Appendix D Drawing "P&ID MINE WATER WET WELL" (6-IX MINE WATER WET WELL PID) illustrates how overflow water from the wet well will be blended with the IX treated water before release to pond #8, the $BaCl_2$ pond, where it will be further diluted with U-treated water. The overflow will activate only during extreme high water levels in the wet well during upset conditions caused by mechanical or electrical faults. Alerts for the IX plant well levels are automated but the controls must be manual because human judgment and verbal communication are needed for decisions about controlling levels when crews are working underground. Depending on the U concentrations and the quantity of overflow, the overflow would be diluted with treated water to reach the U concentration limit of 30 µg/l.

ERRATA – Closeout/ Closure Plan April 2013, Rev.1 November 2013

Section 4.6.2

Replace "The riprap thickness will be not less than two times the average particle diameter and will extend from the southwest corner of the waste pile eastward for at least 400 feet or to the southeast corner of the waste pile at approximately where the arroyo crosses E 559450 (Drawing MT13-CL-13)" with "The riprap thickness will be not less than two times the average particle diameter and will extend from the southwest corner of the waste pile eastward for at least 400 feet or to the southeast corner of the waste pile at approximately where the arroyo crosses *E 2782350* (Drawing MT13-CL-13)".

The E 559450 is a relic from the NAD 27 coordinate system used in the July 2012 CCP (C.4 Earthwork, page 9, Section 2.10.4 and Drawing MT12-CL-09). The coordinate for this point is E 2782300 in the NAD 83 system used for the 2012 Rev 1 CCP and the 2013 CCP.

Drawing MT13-CL-07

The coordinate labels have been corrected. See the correct Drawing MT13-CL-07b.

ADDENDA - Closeout/ Closure Plan April 2013, Rev.1 November 2013

Section 3.3

The mine facilities listed in Table 5.1 as retained by (land) owner for post-mining land use have been selected specifically by the land owner (Sandoval estate) for their use in ranching and related activites. A written statement of this intent, signed by the Sandoval estate and notarized, is in preparation and legal review at the time of this submittal. This document is confidential, but a copy of it will be sent under separate cover to MMD for its records. This document will not be included in the CCP.

Section 4.4

Natural volunteer vegetation exists on all soils in the mine area, demonstrating the suitability of these soils as growth media. To further document soil suitability, RGR has collected and tested at least 20 samples of potential borrow soil from the locations identified in the application as primary borrow sources. RGR selected soil samples to cover the existing borrow piles, the berms around the MWTU ponds, the area north of Marquez arroyo where extensive additional borrow soil is available, the berm and cut slopes around the south storm water pond, and the shaft muck portion of the south waste pile. RGR believes this distribution of the sampled locations provides a representation of likely borrow sources for backfill, liner and cover soil. Actual sample locations are shown on Figure D.3.5-1. The soil samples were tested for elements and other parameters listed in tables 1 and 2 of MARP Guidelines, Attachment #1, as specified by MMD in its letter to RGR dated 3/11/2014. Soil chemistry test results, Table D.3.5 attached to this addendum, show that the borrow soils satisfy the MMD's soil suitability criteria for "good" to "fair" rating. Some nitrate amendment will be needed, which is already anticipated in the closeout cost estimate and revegetation plan. Shaft muck soils will be used for liner construction or blended with other soils for cover construction.

Section 7

RGR has prepared a financial assurance (FA) schedule for the north waste pile based on increments of 10 vertical feet to a total of six increments. This schedule, "COST ESTIMATE - MT TAYLOR MINE CLOSEOUT/ DP-61CLOSURE - NORTH WASTE PILE", is included as an addendum for information only. It will not be included in the FA associated with the revision of the mine permit to active status because, although included in the mine permit, the north waste pile does not presently exist and is considered to be a "succeeding unit" (19.10.12.1202 A (2)(b) NMAC). Reclamation cost for the north pile will be added to the FA incrementally if, or as, the pile is developed.

The north waste pile cost estimate does not include cost for the access road to that pile. The access route to the north pile would be along the treated mine water pipeline, for which the reclamation is already covered in the CCP FA.

The 2012 Rev.1 CCP cost estimate includes an amount to cover cost of removal of the existing 60,000 tons of ore and to remove the ore pad and related contaminated soil. The FA for the 2012 CCP remains in place until the ore is removed and the ore pad area is cleared of contaminated soils, at which time the FA based on the 2012 CCP cost estimate would be replaced by the FA based on the 2013 CCP cost estimate. This would provide a clean, one-time change from one FA to the next without the need for one or more modifications, and the cost associated with ore pad clean-up would be covered without interruption

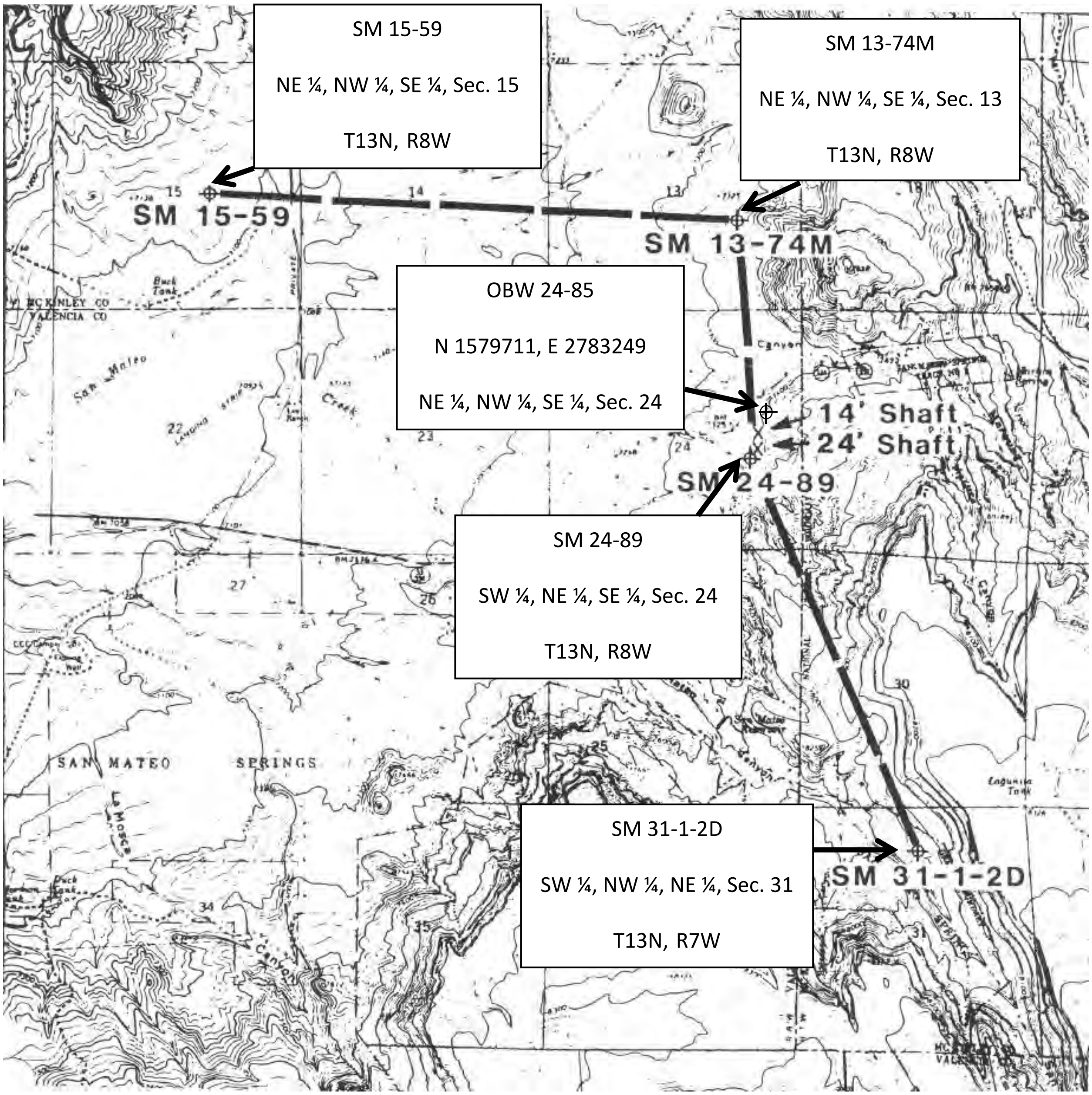
Appendix F

The weed inventory and weed control program will be implemented one year after completion of earthwork for mine reactivation.

Table 5.2 and Appendix F, Table F.1

The perennial flower mix has been removed and the application rates of the other listed species have been increased proportionately.

Tables C.5.1 and C.5.2 in Appendix C.5 are superseded by Table F.2 and F.2 in Appendix F.



OBW and SM observation wells drilled to the Westwater level and cased with 3 7/8 " drill pipe, then used to monitor drawdown during initial mine dewatering. To be plugged at closeout.

Figure 1-6   Observation wells

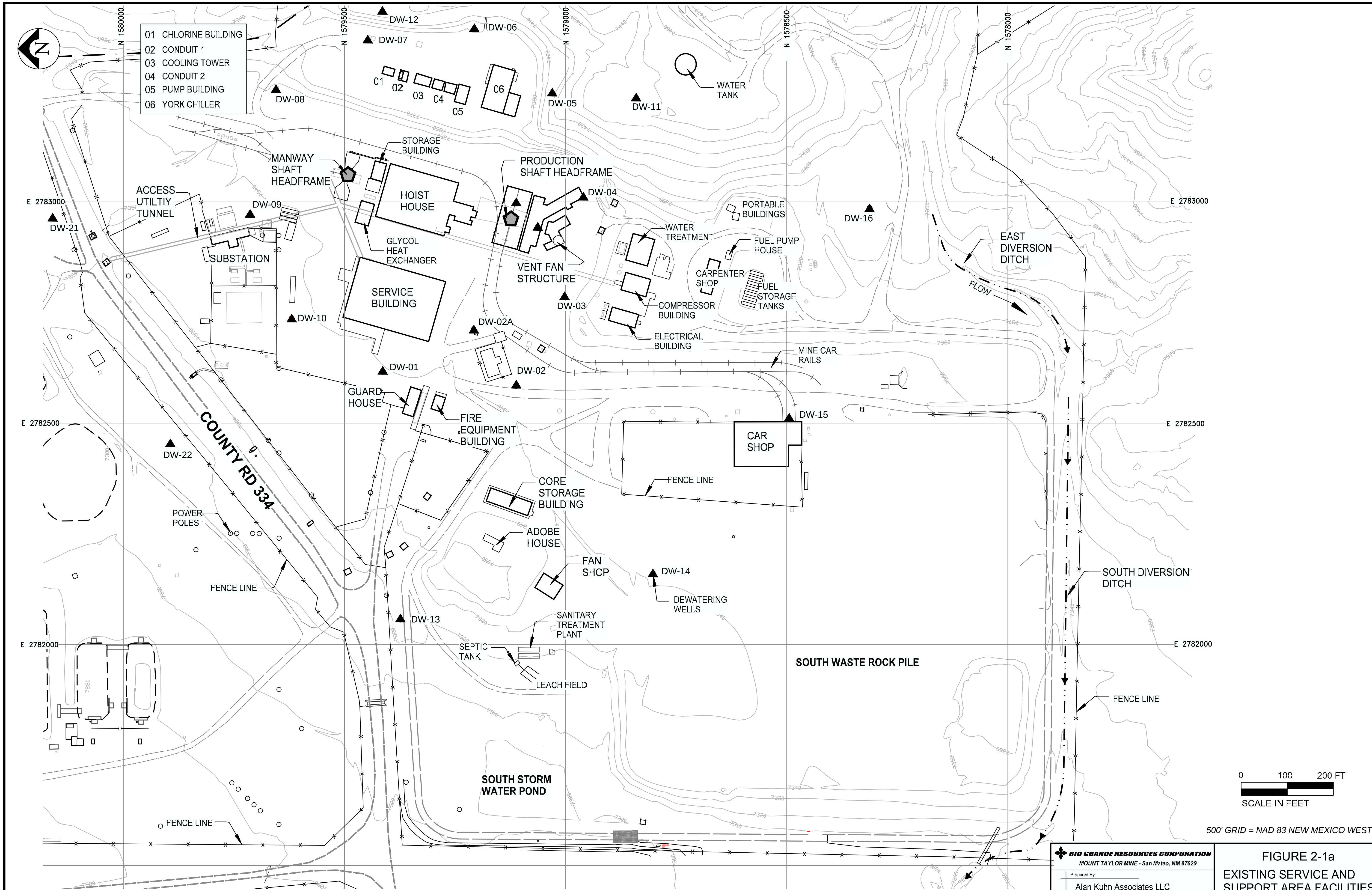
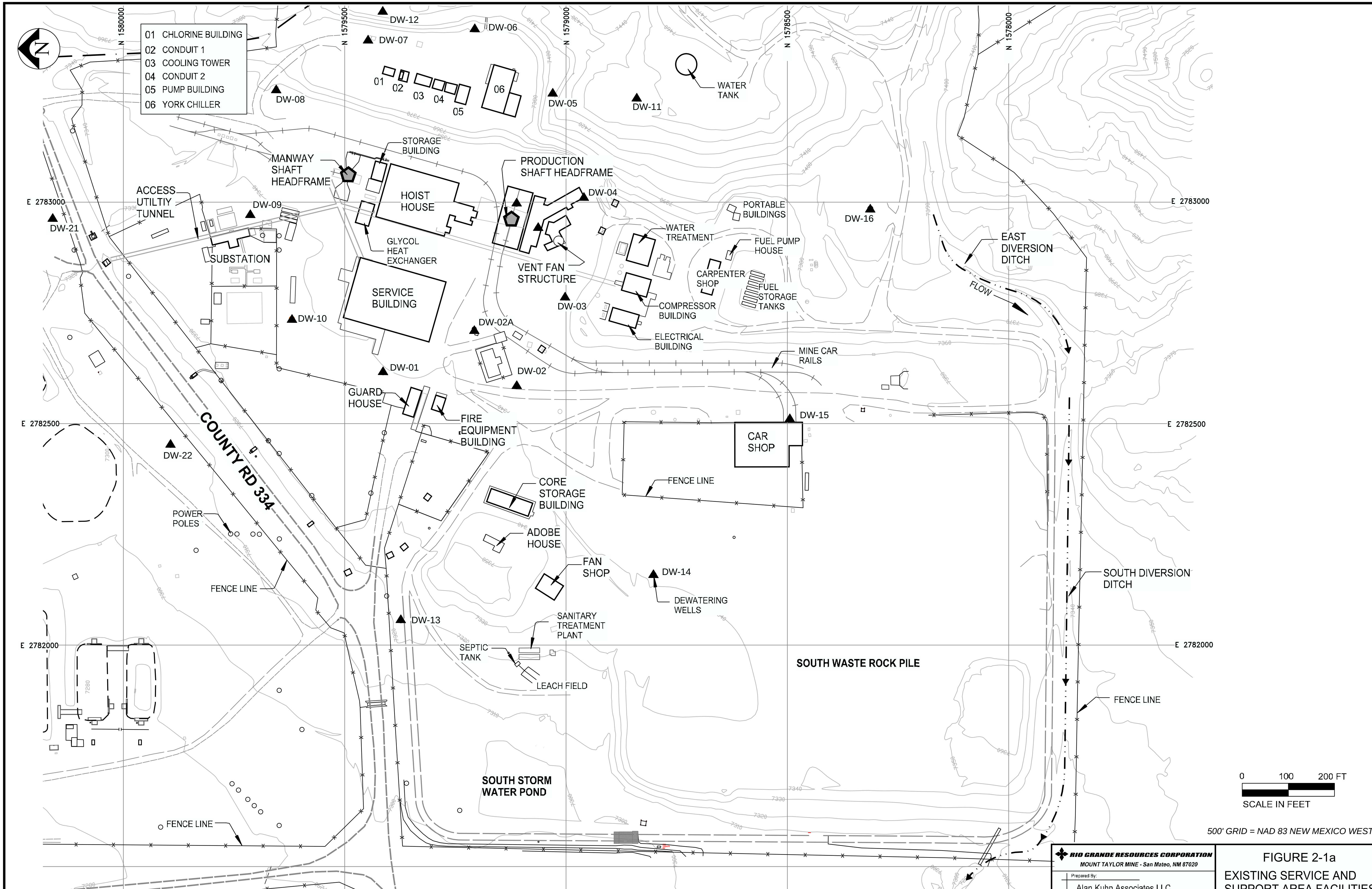
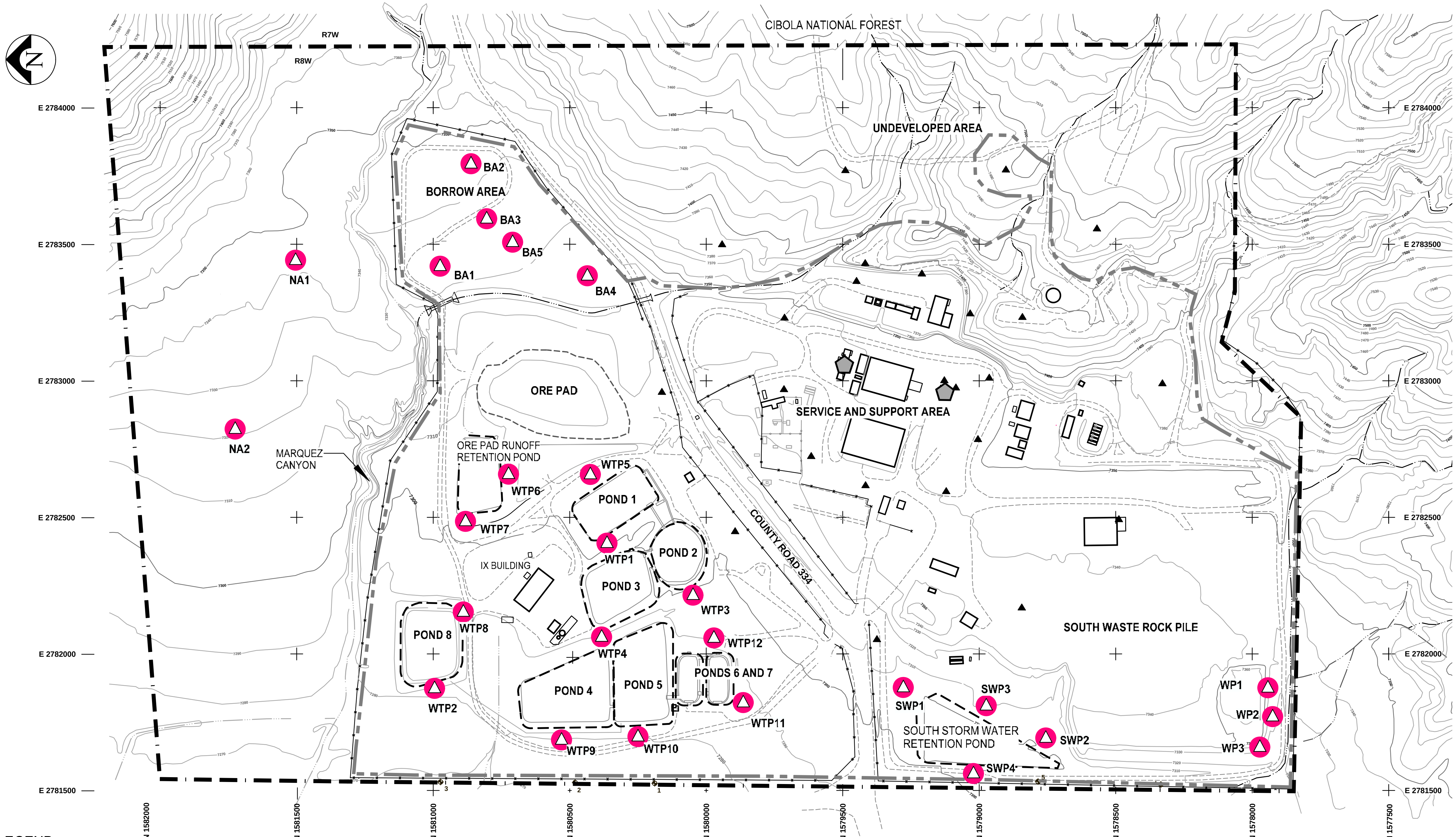


FIGURE 2-1a
EXISTING SERVICE AND SUPPORT AREA FACILITIES



RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020
Prepared By:
Alan Kuhn Associates LLC

FIGURE 2-1a
EXISTING SERVICE AND SUPPORT AREA FACILITIES



LEGEND

- DISTURBED AREA
- MINE SURFACE UNITS AREA
- DEWATERING WELLS
- PONDS
- SUPPORT BUILDINGS
- MINE SHAFT
- COVER SOIL BORROW SAMPLE LOCATIONS

0 200 400 FT

SCALE IN FEET

500' GRID = NAD 83 NEW MEXICO WEST

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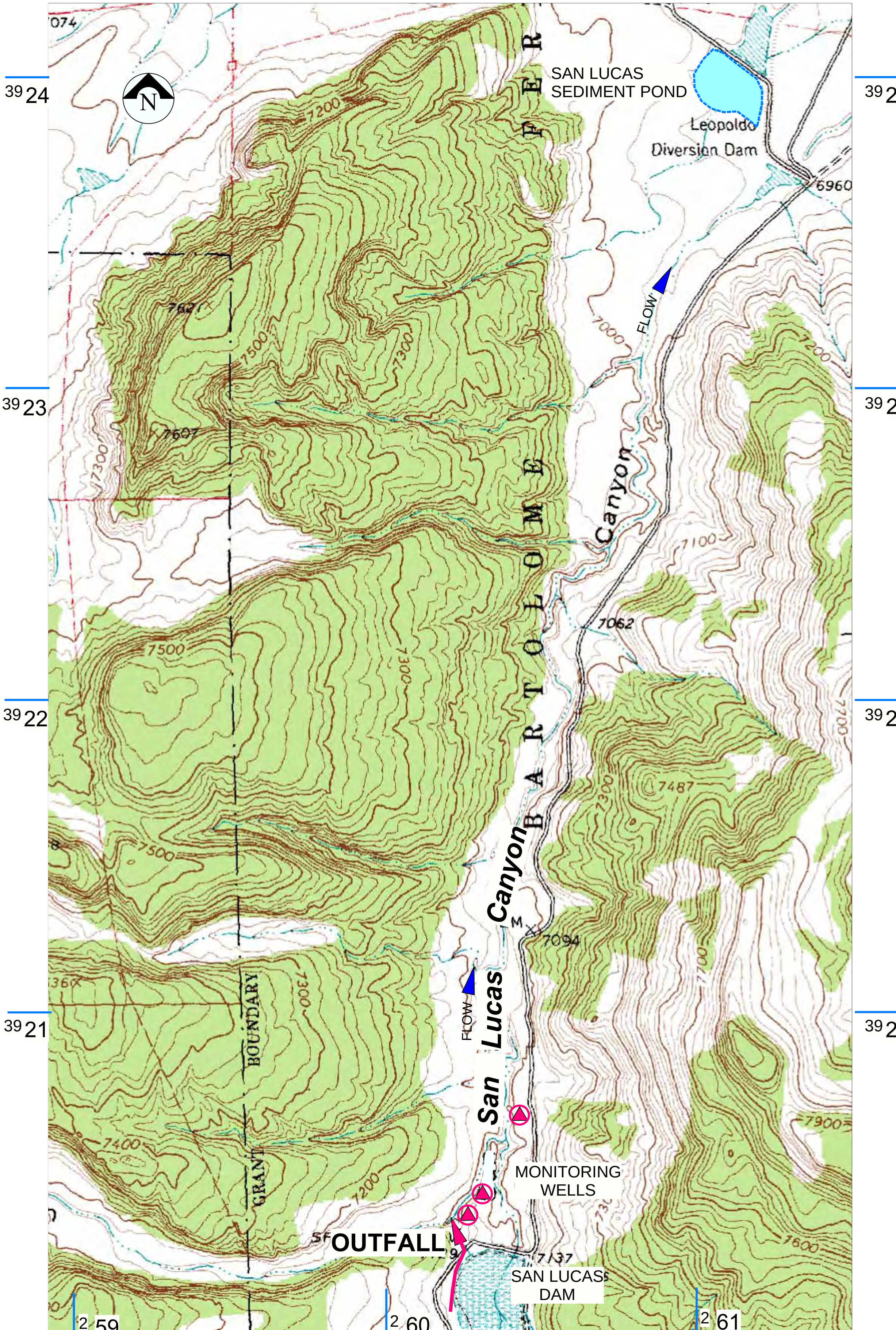
Alan Kuhn Associates LLC

Figure D.3.5-1

COVER SOIL BORROW SAMPLE LOCATIONS



Graphic Scale

0 ft 1000 2000 3000 4000 ft

Note: Map derived from USGS Quad Map San Lucas Dam, 1963 (revised 1980)

RIO GRANDE RESOURCES CORPORATION MOUNT TAYLOR MINE - San Mateo, NM 87020		TITLE: FIGURE E-1 SAN LUCAS CANYON MAP
Prepared By: Alan Kuhn Associates LLC	DATE: 11/19/13	

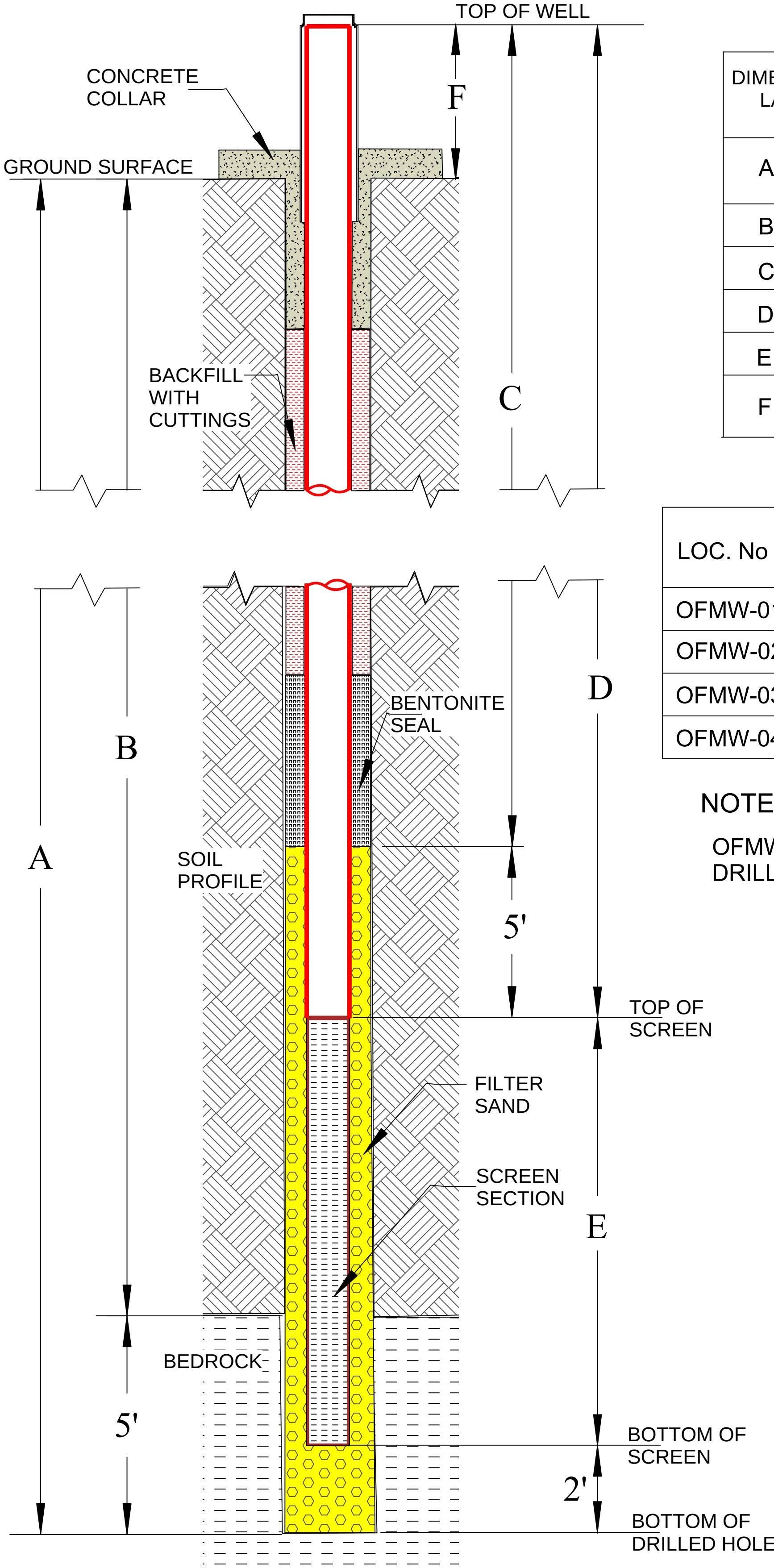
RIO GRANDE RESOURCES CORPORATION

MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By:
Alan Kuhn Associates LLC

DATE: 11/19/13

FIGURE E-2
OUTFALL AREA -
SOIL SAMPLING AND
MONITORING WELL LOCATIONS



NOT TO SCALE

DIMENSION LABEL	DESCRIPTION
A	TOTAL DRILL DEPTH GROUND SURFACE TO BOTTOM OF HOLE
B	GROUND SURFACE TO TOP OF BEDROCK
C	TOP OF WELL TO TOP OF FILTER SAND
D	TOP OF WELL TO TOP OF SCREEN
E	SCREEN LENGTH
F	TOP OF WELL TO GROUND SURFACE

LOC. No	A *(feet)*	B *(feet)*	C *(feet)*	D *(feet)*	E *(feet)*	F *(feet)*
OFMW-01	70	65	NA	NA	NA	NA
OFMW-02	90	85	77	82	10	3.75
OFMW-03	85	80	71	78	10	3.46
OFMW-04	100	95	87	92	10	3.83

NOTE:

OFMW-01 - NO MONITORING WELL INSTALLED.
DRILL HOLE BACKFILLED WITH CUTTINGS

WELL DATA

DRILL HOLE DIAMETER = 8 INCHES

WELL CASING = 4" SCH 80 PVC

JOINTS = FLUSH

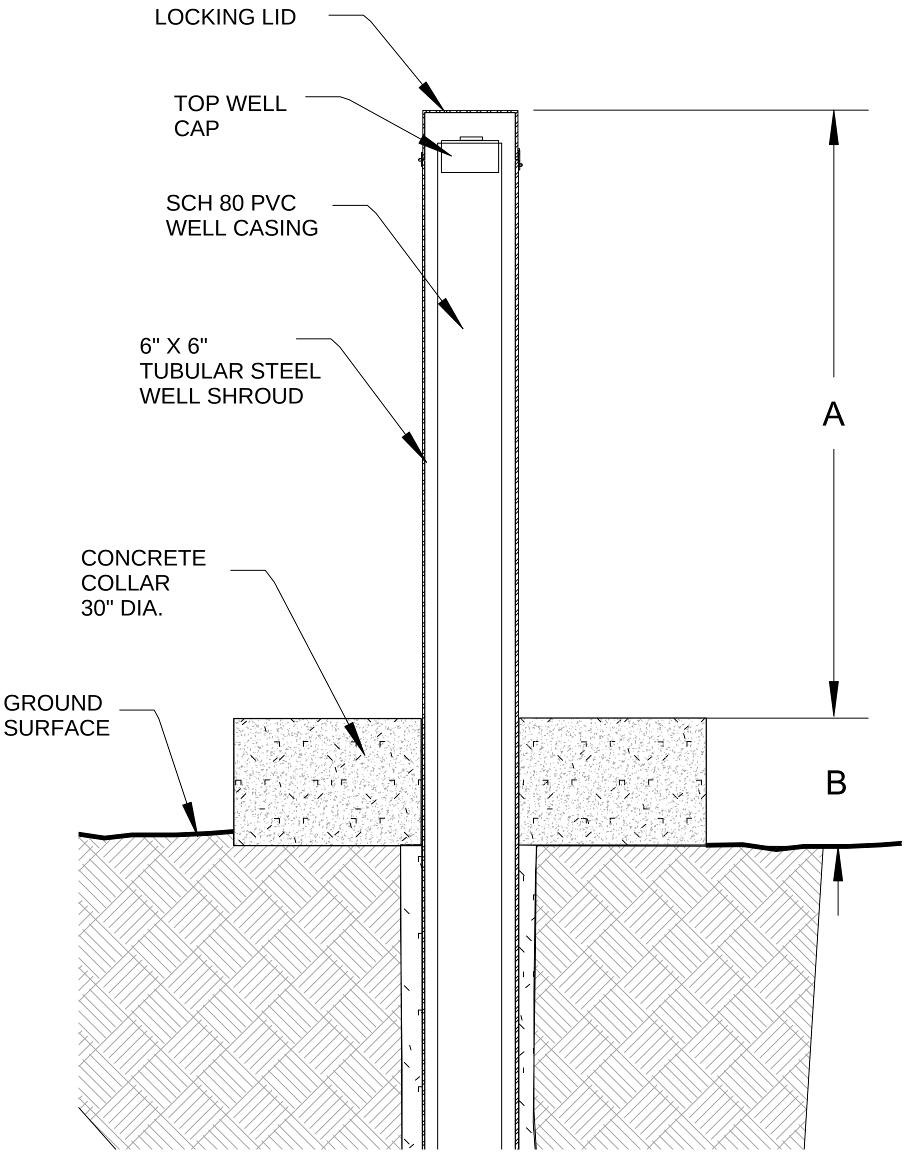
OUTFALL MONITORING WELLS INSTALLED FROM 10-28-13 THROUGH 10-30-13

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By:
Alan Kuhn Associates LLC

DATE:
11/19/13

TITLE: FIGURE E-3
MONITORING WELL GRAPHIC LOGS



WELL NUMBER	DIMENSIONS	ELEVATIONS	
OFMW-01	NO WELL INSTALLED	BACKFILL DRILL HOLE WITH CUTTINGS	
		GROUND SURFACE	7107.91
OFMW-02	A = 38.0"	TOP OF STEEL CASING	7110.09
		TOP OF CONCRETE	7106.92
	B = 7.0"	GROUND SURFACE	7106.34
OFMW-03	A = 33.5"	TOP OF STEEL CASING	7102.28
		TOP OF CONCRETE	7099.49
	B = 8.0"	GROUND SURFACE	7098.82
OFMW-04	A = 38.0"	TOP OF STEEL CASING	7104.53
		TOP OF CONCRETE	7101.36
	B = 8.0"	GROUND SURFACE	7100.70

0 1 FT 2 FT

GRAPHIC SCALE

OUTFALL MONITORING WELLS
INSTALLED FROM 10-28-13
THROUGH 10-30-13

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By:
Alan Kuhn Associates LLC

DATE: 11/19/13

TITLE: FIGURE E-4
TOP OF MONITORING WELL DETAILS

LEGEND

▲ SAMPLING LOCATION

0 200 FT 400 FT

GRAPHIC SCALE

GRID =NAD 83 NM WEST

RIO GRANDE RESOURCES CORPORATION

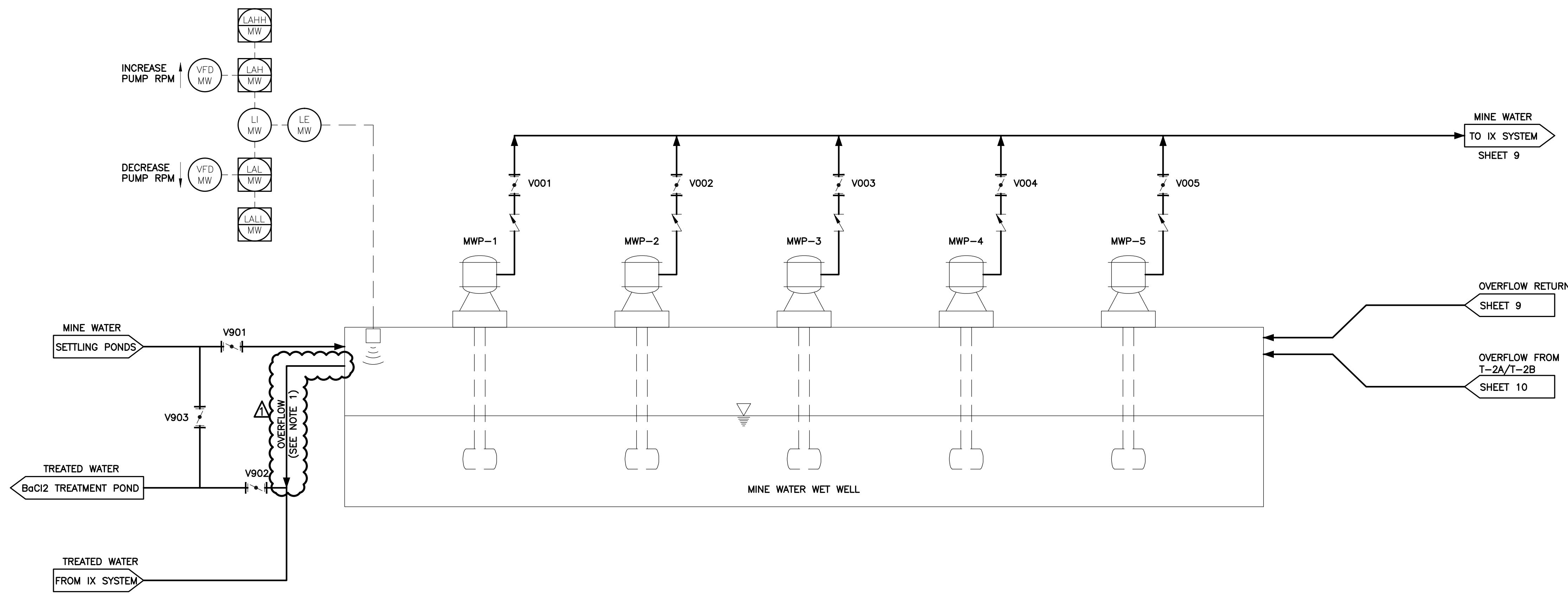
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By:
Alan Kuhn Associates LLC

DATE:
11/19/13

FIGURE E-5

SAN LUCAS SEDIMENT POND AREA - SOIL SAMPLING LOCATIONS



MWP–1 MWP–2 MWP–3 MWP–4 MWP–5

MINE WATER TRANSFER PUMPS

GPM 2,500 @ 40' OF HEAD
MOTOR HP: 40
MATERIAL: CAST STEEL, BRONZE TRIM

MINE WATER WET WELL

SIZE: 30'x6'x8'
CAPACITY: 10,800 GALLONS

NOTE:

1. OVERFLOW WILL ONLY BE USED DURING EXTREME HIGH WATER LEVELS RESULTING FROM ELECTRICAL, EQUIPMENT, OR INSTRUMENT FAILURE.

DRAFT

DAN S. LEYENDECKER, P.E. NO. 18550

*** REVISION BLOCK ***

DATE	NO.	DESCRIPTION	BY
	1	ADDED OVERFLOW	
	2		
	3		

DRAWN BY: DWH
CHECKED BY: WLB
APPROVED BY: DSL
SCALE: N.T.S.
MARCH 2013

MT. TAYLOR URANIUM MINE/RIO GRANDE RESOURCES CORP., NEW MEXICO
URANIUM ION EXCHANGE FACILITY
P&ID–MINE WATER WET WELL

LNV engineers | architects | contractors
801 NAVIGATION, SUITE 300
CORPUS CHRISTI, TEXAS 78401
TBPE FIRM NO. F-366
PH. (361) 883-1984
FAX (361) 883-1986
WWW.LNVINC.COM

8 / 10
JOB NO. 130040
TAB NO. MW PID
SHEET NO. 8 OF 10

U:\Rio Grande Resources\130040 Mt. Taylor Mine Water Treatment\000\Drawings\Plans\Civil\8-IX MINE WATER WET WELL PID.dwg
Thursday March 06, 2014, 4:29pm

APPENDIX F

REVEGETATION AND WEED MANAGEMENT PLAN

MT. TAYLOR MINE

RIO GRANDE RESOURCES

November 2013

PURPOSE AND SCOPE

This Plan, part of the Closeout/ Closure Plan (CCP) for the Mt. Taylor Mine, describes the measures that Rio Grande Resources (RGR) will take to re-establish vegetation on disturbed areas within the mine permit area that will minimize additional disturbance, mitigate impacts to affected environmental resources, rehabilitate disturbed areas as concurrently as practical to support post-mining land use (PMLU), and provide protection of soil and runoff comparable to the natural conditions in the local area.

The requirements of this Plan will be implemented primarily by a contractor at the time of mine closeout, but increments will be implemented during mine operations. Specifically, to achieve revegetation as early as possible on final surfaces, the lower slopes of the south waste pile will be reshaped to final grade and revegetated as part of mine reactivation. Additionally, a test plot will be established on the cover of the reactivation waste disposal cell located on the south waste pile. This test plot will be used to verify and refine revegetation methods and seed mixes proposed in this Plan. The areas to be revegetated include:

The mine surface facilities are located on 285.6 acres, of which approximately 148 acres are disturbed land and the remaining 137.9 acres are undisturbed. Of that area, 117 acres will be revegetated consisting of:

- Support (Service and Support) Facilities – 55.7 acres
- Mine Water Treatment Area - 28 acres
- Treated Water Discharge Pipeline - 15 acres (most beyond the mine surface area)
- Ore Stockpile - 6.8 acres
- Waste Pile - 11.5 acres

The remainder of the disturbed area not to be revegetated includes the buildings, roads and storm water ponds preserved for PMLU.

GROUND PREPARATION

To prepare the mine site ground surfaces for revegetation, mine facilities not preserved for PMLU will be removed (Specification C.2) and the disturbed areas within the mine permit area will be regraded (Specification C.4), including backfill of mine water treatment pond basins, to approximate original grades.

Regraded material will be placed to minimize potential adverse effects to surface water, ground water and natural conditions of areas outside of the mine area. All surfaces will be graded to a final surface configuration which will support the approved post-mining land use, which will be grazing. Temporary runoff and erosion controls, specified in the Stormwater Pollution Prevention Plan

(SWPPP) prepared by the earthwork contractor, will be employed to management sediment generated during closeout earthwork.

Grading operations will be performed by dozers, scrapers, graders or other support equipment. An excavator with hydraulic hammer will be used to reduce the high wall to 1H:1V slope. Finish grading will create the grades and slope directions shown on the drawings (MT13-CL-07 through -13), which may include shallow depressions and will have a roughened surface suitable for seed nesting and resistance to erosion.

REVEGETATION

Revegetation will be performed in accordance with this Plan and Technical Specification C.5 of the CCP. Details of the execution of the following activities are provided in that specification.

Topdressing (Topsoil) Removal, Stockpiling, and Redistribution

At the Mt. Taylor Mine, the bedrock outcrops in many places and is otherwise covered with a thin blanket of colluvial, alluvial, or residual soil. The soil profile is typically 0-24 inches of “A” horizon over “C” horizon (bedrock). The exception is the buried paleochannels where alluvial soil with “A” horizon characteristics overlies bedrock. Consequently, the topdressing or topsoil consists of “A” horizon soils. All site soils fit this definition of topsoil. The agronomic descriptions of these soils are given in the CCP, Section 4.4.

During mine construction, site soils were excavated to create pond basins and other surficial features on the site. Most of the excavated soil was used to construction pond berms and to adjust grades for mine surfaces facilities. Excess excavated soil was stockpiles in the borrow area east of the ore stockpile (Drawing MT13-CL-04). Topdressing soil will be obtained from regrading of pond berms, the borrow area, and other grading performed during ground preparation. Table 4.2 (CCP) lists the available soil volumes versus borrow soil required for closeout; ample soil is available from these various sources, all on site.

When the excavation of contaminated soil has been finished, RGR will determine whether at least six inches of clean soil remains in place in areas to be revegetated. Where additional soil is needed to provide this minimum soil thickness, the excess borrow soil (Table 4.2 of the CCP) will be applied as necessary.

The nutrient level in the topdressing will be determined through soils analysis. Where needed, custom fertilizer blends will be applied to the topdressing to enhance deficient nutrient levels based on this testing. Fertilizer will be applied using either a spreader or broadcaster. Fertilization will occur during the season most conducive to application of the elements involved. For instance, stable elements (phosphorus) may be applied during the second or third growing season. Application rate and timing will be chosen to maximize the effectiveness of the nutrient being applied. Any topdressing materials that have been stockpiled for over a year will be analyzed for nutrient content. Any fertilizers deemed necessary to enhance plant growth will be distributed and disked into the topdressing.

The surfaces of the topdressed areas will be scarified or disced as necessary to prepare for application of amendments and seeding. Traffic on the prepared surfaces will be limited to equipment directly engaged in revegetation work.

Revegetation Species and Planting Rates

Species of plants selected for seeding are compatible with the pre-mining and post- mining land use of grazing. Seed for the dominant species of grasses and shrubs that are indigenous to the mine area are available commercially and will be secured through such sources. The proposed seed mixture for permanent seeding and planting rates are contained in Table F.1.

Methods of Revegetation

Revegetation methods will follow established techniques and basic agronomic principles. Primary revegetation methods objectives are to:

- reduce plant competition and prepare a good seedbed;
- provide sufficient plant nutrients;
- seed at the proper time and depth; and
- modify the moisture regime to supply sufficient water.

Seedbed preparation will be conducted on the contour to reduce erosion. Discing will be utilized to:

- ameliorate compaction of the topdressing to facilitate penetration of roots by seedlings;
- prevent surface crusting of the topdressing; and
- eliminate large clods of soil.

Seeding will employ a variety of methods, depending principally on the steepness of the slope. A large percentage of the total disturbed area will be seeded using standard mine reclamation equipment; i.e., tracked and wheeled tractors, rangeland seed drill, and mulch applicator. In areas with slopes of 3H:1V or steeper (natural or cut slopes east of the shafts), a mixture of manual and mechanical application techniques will be used, including hand broadcasting and heavy chains dragged by a tracked dozer to incorporate the seed with the soil.

Before seed is applied, the ground surfaces will be scarified to provide a proper seed bed. Seed will then be applied by either rangeland drill or broadcast. Broadcast seed will be incorporated into the growth medium by hand raking or some mechanical means such as heavy chains dragged behind tracked dozers.

The disturbed surfaces will be reseeded using the seed mix described in Table F.1. The method of reseeding will be determined according to location and size of area to be reseeded. In general, drill seeding will be used on flatter slopes covering larger areas. Broadcast seeding will be used on shorter, steeper slopes. Hand seeding may be required on longer or very steep slopes.

All reseeded areas will be mulched utilizing native grass mulch, straw or other approvable mulch material at an application rate of 1.5 to 2.0 tons per acre. The mulch will be mechanically applied and subsequently crimped to reduce wind loss and stacking. The benefits from the utilization of mulch include:

- great reduction in wind and water erosion of soil, especially prior to the establishment of vegetation;
- increased infiltration and enhanced retention of soil moisture levels to facilitate germination of seed; and
- reduction of soil surface temperatures.

Runoff Control

During the revegetation period, temporary runoff controls will be used as necessary to impede or divert rainfall and snowmelt runoff from revegetated areas. Locations of temporary runoff controls will be selected to retard or divert runoff, trap sediment, and provide improved conditions for germination and plant establishment.

Runoff control during revegetation will include methods recognized by the NRCS or the International Association for Erosion Control. Measures that use present technology include check dams constructed of hay bales, geotextile silt fences secured in shallow trenches, and water bars across the disturbed area and perpendicular to the slope. Tobacco net, Curlex or similar net-and-fiber mats might be used as required for protection of surfaces susceptible to rilling or wind erosion. The specific measures applied to revegetated surfaces will be based on the method most appropriate for the seeding method, erodibility and depth of the soils, degree of slope, proportion of large rocks at the surface, roughness of the surface, and anticipated rainfall.

REVEGETATION SUCCESS

Revegetation success will be evaluated using a two phase approach. The initial phase will use an interim technical standard based on range site descriptions described in Table C.5.2.

The second phase will be a test plot program. This program will begin at the time of mine reactivation, well before closeout, providing ample time for the test plot to be planned, implemented, and evaluated before site revegetation occurs at closeout.

Interim Technical Standard

An initial interim technical standard for revegetation success has been developed based on range site descriptions obtained from the Natural Resource Conservation Service (NRCS, 1980) for soil mapping units existing on the mine site (Table F.2). This standard will remain in effect until either the volunteer revegetation success is determined to support a higher standard or a test plot program has produced acceptable results that support a more site-specific standard. The NRCS information will be coupled with data collected from undisturbed vegetation types on the area north of Marquez Canyon arroyo to estimate appropriate standards for cover, which could include:

- % by species,
- production in lbs/ac,
- density (number of shrubs/ac), and
- diversity (richness and/or evenness).

Range sites described in accordance with the Soil Conservation Service, 1976, National Range Handbook, U.S. Department of Agriculture, as amended, may also be used in part to develop the technical standards.

The initial interim technical standard will be refined by results from a vegetation survey on 40 acres of undisturbed land north of Marquez Canyon arroyo. Sites for each vegetation type to be sampled will be at least one acre in size. Vegetation types to be sampled for developing the technical standard will be representative of mine area and in as good or better condition than existing vegetation in the mine area. To the extent possible, vegetation sampling will be done during a normal precipitation year and during the peak period of the growing season.

This information will be combined with the NRCS information to make the interim standard specific to the Mt. Taylor Mine site and will also be used to plan the test plot program.

When the interim technical standards has been developed then reviewed and approved by the MMD, a plan for periodic monitoring of the vegetation in the technical standards area will be proposed. This monitoring program will provide the basis for comparison between the vegetation of the test plot and the natural vegetation of the technical standard area. If justified by these comparisons, the test plot program can be revised or the revegetation standards can be revised. All data and copies of all documents and reports used to develop the technical standards used to develop and evaluate or monitor the technical standard will be made available to the MMD. Vegetation types to be sampled for developing the technical standard should be in as good or better condition and should be representative of areas to be disturbed.

Test Plots

A test plot will be developed on the cover of the activation waste disposal cell on the south waste rock pile. This plot will serve several purposes:

- Demonstrate and document the success of selected plant species, amendments, and planting methods
- Verify adequacy of 2.0 ft of cover thickness for support of vegetation
- Measure and document the radon attenuation of the cover with vegetation

The test plot area, approximately 1.6 acres, will occupy the entire cover of the activation waste disposal cells, as shown on Figures 3-2 and 3-3 of Revision 1 of the Application for MMD Permit Revision and Modification of DP-61 (RGR 2013b). Once this cover is in place, this area will not have any traffic and will be fenced to prevent casual access.

The test plot area will be subdivided into not fewer than 10 individual plots, each not more than 30 feet wide by not less than 100 feet long. Two plots, one without amendments and the other with amendments to be determined, will be used for each of the following seed mixes:

- Western Wheatgrass
- Alkali Sacation
- New Mexican Feathergrass
- Blue Grama, Spike Mulhy Galleta
- Fourwing Saltbush
- The proposed Initial Interim Standard mix on Table F.2

The planting rates for each species will be those listed in Table F.1

The test plots will be monitored by RGR will assistance from a vegetation consultant. Less formal monitoring shall be conducted through the year by RGR personnel to identify conditions in the revegetated areas that may require attention. The test plot program will continue until the three purposes of the program, listed above, have been achieved to the satisfaction of MMD.

The monitoring data will include measurements of species composition and vegetation cover, frequency, density, reproductive status, and overall vigor. Vegetation sampling should be done during a normal precipitation year and during the peak period of the growing season (i. e. summer). These data will be compared to the interim success standards for refinement of those standards and for making adjustments in the test program. For at least the first two years, these data will be collected in the spring, summer and fall (end of growing season). Thereafter, an annual survey of the revegetated areas shall be conducted toward the end of the growing season, no later than early September by a qualified vegetation specialist. Survey results shall be analyzed and summarized to aid in determining the need for any changes in management practices or the need for reseeding or other supplementary practices. All data used to develop and evaluate or monitor the test plots, and copies of all documents and reports used to develop the interim technical standards, will be made available to the MMD.

IMPLEMENTATION

Revegetation will occur incrementally over the life of the mine on the waste pile slopes and after completion of other closeout activities on the other disturbed land surfaces. Implementation of revegetation will be performed in accordance with this Plan and Technical Specification C.5. Subsequently, a period of revegetation success monitoring will occur during the last 2 years of bonding period. The period of responsibility will continue after completion of closeout until release of the bond.

SUCCESS CRITERIA

The vegetation success standards, determined through refinement of the interim standards by results of the test plots, will be used as the basis for determining revegetation success for perennial vegetation cover and herbaceous productivity. Revegetation will be considered successful for vegetation cover and herbaceous productivity if the reclaimed area and cover and productivity are not significantly different from 90% of the success standard at a 90% level of statistical confidence.

Sample Adequacy

Reclaimed and test plot areas will be sampled separately to allow separate determination of sample adequacy. A minimum of 20 cover transects and 20 productivity quadrats will be sampled in the test plot area. On the revegetated disturbed areas, a minimum of 15 transects, 100 m long, will be located randomly, and for consistency these transects will be revisited for each sampling event.

The minimum sample size will be the larger of:

- The N_{min} value using the methods of Cochran, W.G., 1977. *Sampling Techniques*, 3rd ed. John Wiley and Sons, New York, N.Y. or
- The minimum size required for the specific sampling method

All parameters should be tested at the 90% confidence level with a 10% change in the mean (d=.1).

Sampling Methods

The following sampling methods for conducting vegetation studies will be used for determining revegetation success of test plots and reclaimed areas.
For sampling methods that require the use of quadrats, each quadrat will be rectangular or square plots of m^2, or ¼ m^2 or 20 x 50cm in size or a ¼ m^2 – m^2 circular plot.

Species Diversity

Vegetation cover data will be used for determining revegetation success with respect to species diversity. A technical standard for diversity will be applied which will include the following criteria:

- The revegetated area will have at least three perennial grass, two perennial forbs, and two shrub species.
- The diversity of species will be similar to the NRCS Range Site Descriptions.

Cover

Cover will be sampled by the line interception method, in which percent cover is obtained by summing the relative lengths of the transect that are covered, including vegetation, litter, rock, bare ground. Transects will be 1OOm long, randomly placed within the test plot area and revegetated areas. This method will follow the procedures of Canfield, R.H., 1941. *Application of the Line Interception Method in Sampling Range Vegetation.* For. 39:388-394.

Cover classes, listed in the table below, will be used to supplement the line intercept method in the test plots. A minimum of two quadrats will be randomly placed within each individual test plot. The percent of ground covered by vegetation to the nearest cover class will be estimated for each quadrat, and values will be reported by species and total vegetation cover. Each quadrat or frame plot is considered one sampling unit. The mid-point of each class is used to calculate the mean and standard deviation.

Cover Class	Range, %	Mid-point, %
1	0-1.0	0.4
2	1.1-3.0	2.0
3	3.1-5.0	4.0
4	5.1-10.0	7.5
5	10.1-15.0	12.5
6	15.1-25.0	20.0
7	25.1-35.0	30.0
8	35.1-45.0	40.0
9	45.1-55.0	50.0
10	55.1-65.0	60.0
11	65.1-75.0	70.0
12	75.1-85.0	80.0
13	85.1-95.0	90.0
14	95.1-100	97.5

Reference: Daubenmire, R., 1959. *A Canopy-Cover Method of Vegetational Analysis.* Northwest Science 33:43-63.

Density

Because of the sparsity of natural trees and shrubs in the area, density will be measured by exact count. In test plots, the entire plot will be counted. In revegetated areas, the counts will be made the line interception transects.

Productivity

Productivity will be measured by clipping from quadrats established for cover classes. Plants will be clipped by life form (e.g., herbaceous or woody) to a three inch stubble height. All standing biomass will be clipped for grasses and forbs; for shrubs, only current year's growth will be clipped. Noxious weeds will not be clipped. Samples will be oven dried and weighed to the nearest 0.1 gram. For sample adequacy, the combined weight of each life form at each plot will be used. Report Productivity will be reported as pounds/acre.

The minimum samples size for the test plots will be two quadrats per plot or a total of 20 quadrats. For the revegetated areas the minimum sample size will be 10 quadrats.

Similarity/ Diversity Indices

Either Jacard's Community Coefficient or Sorensen's Similarity Index will be used to evaluate diversity.

BOND RELEASE

Revegetation sampling will be conducted during the last year of the responsibility period for bond release purposes. A formal application requesting bond release and a report describing the revegetation will be submitted to the Director of MMD for approval. Release application will be submitted no sooner than the end of the 12th growing season. The report will include a description of acreage, and mine soils or topdressing materials used in reclamation. Data will be tabulated to demonstrate that revegetation success criteria have been met for the reclaimed area. The data will include comprehensive species lists and grass species seasonality. Successional development will be discussed in terms of reclamation techniques, potential climate and recognized successional stages of natural vegetation of the area. A post-mining vegetation map will depict location, size, shape and proportion of cover and forage areas.

REVEGETATION SCHEDULE

After disturbed lands have been regraded and topdressed, the seedbed will be prepared and the permanent seed mixture planted during the first normal planting season. Since most precipitation as rainfall occurs in the summer and in order to favor the establishment of warm season species, the normal planting season will occur from late spring through summer. Ongoing research, field experience, or variations in normal weather patterns may require planting and seeding operation to be conducted at other times of year.

The overall timetable for revegetation is dependent on the rate at which the mine water treatment ponds can be dried through evaporation. All other closeout activities involving demolition and earthwork outside of the pond basins can be completed within the time that will be required to dry the treatment ponds. Assuming that all residual water in those ponds can be evaporated during the year in which other facilities demolition and earthwork is accomplished, the pond earthwork will be completed in the second year of closeout. Therefore, revegetation of the entire mine area should be completed in the late summer or fall of that year.

WEED MANAGEMENT

Overview

This plan is based on encouraging desired plant species as well as eliminating weeds. Preventive programs will be implemented to keep the mine area free of pest species that occur in the vicinity. This plan follows an adaptive management approach:

- Weed species are identified through an inventory on the mine area and from information on neighboring areas.
- Land management goals and weed management practices are developed for the mine area.
- Priorities are assigned to eradicate or reduce weed species and weed patches based on their impacts as well as the ability to control them.
- Control methods are identified.
- Integrated Weed Management (IWM) plans are developed
- IWM plans are implemented
- IWN results are monitored and evaluated
- Modifications are made to improve IWM plans and actions

Management Area

The area for this program includes the disturbed lands within the mine permit area as well as adjacent undisturbed portions of the permit area that could contribute to, or be impacted by weeds in the disturbed area.

Resource Base

Upon reactivation of the mine, a biological resource study will be performed to document the biological communities and valued species, weed species, land-use histories, major threats and other notable characteristics of the mine area.

Inventory of Weed Species

The inventory plan as well as results of the inventory will be presented, emphasizing those found on the mine site as well as those likely to invade the site. A map of the weed infestations will be prepared.

Weed Management Objectives and Goals

The objectives of weed management are broader than simply weed control and include the desired biological communities, forage production, and land stewardship. Potential impacts of weeds will be described. Objectives will be specific, measurable and achievable within the timeframe related to mine operations and closeout. Specific weed management goals that serve these objectives will be identified for each weed species.

Weed Management Priorities

Prevention – The first priority is to prevent weeds from becoming established.

Species Priority – The species posing the greatest threat to management goals or those most difficult to control will receive priority.

Infestation Priorities – Locations of infestations that pose the greatest threat to high-value resources will receive priority. These locations will be identified and monitored during weed management actions.

Weed Management Actions

Prevention – RGR will perform periodic inspections of revegetated land to identity weeds and mark them for eradication. Bare ground will be re-seeded to reduce the likelihood of weed invasion. A list of the most important weed species will provide the basis for prioritizing eradication actions.

Weed Control – Based on the results of the resource base study and inventory of weed species, RGR will develop a weed control program using IWM principles and species-specific control measures. These measures could include application of herbicides, mechanical removal, or burning.

Monitoring

The effectiveness of the weed control efforts will be evaluated through annual monitoring usually at he peak of the growing season (July-September). Monitoring measures will include visual examination of vegetation species and densities along the line intercept transects as well as random observations beyond the transects, especially in those areas where weeds were identified or where eradication measures were taken previously. Weed species and distributions will be mapped each year, providing a reference for control measures as well as locations to revisit for further assessment in succeeding years.

The results of monitoring will be used to refine the IWM program and to adjust future weed management actions.

Table F.1 Seed Mix: Selected Species and Planting Rates

1. Western wheatgrass *(Agropyron smithii)* Rate: 9 PLS/ft^2

   Cool season native perennial grass, reproduces from seeds and rhizomes, growth starts when daytime temperatures reach 12-13 C, grows in dry, rocky soils.

2. Winterfat *(Ceratoides /anata)** Rate: 3 PLS/ft^2
3. Blue grama *(Boute/oua gracilis)** Rate: 10 PLS/ft^2

   Warm season native perennial grass, reproduces from seed, tillers, and rhizomes, growth starts May- June, grows on rock slopes.

4. Galleta *(Hilaria jamesii)* Rate: 9 PLS/ft^2
5. Alkali Sacaton *(Sporobolus airoides)* Rate: 9 PLS/ft^2
6. Mountain mahogany *(Cercocarpus montanus)* Rate: 5 PLS/ft^2
7. Fourwing saltbush *(Atriplex canescens)* Rate: 4 PLS/ft^2

   Evergreen native perennial shrub, reproduces from seeds, grows on grassy uplands, excellent reclamation species.

8. Globemallow *(Sphaeralcea fend/en)* Rate: 3 PLS/ft^2
9. Narrowleaf Penstemon *(Penstemon angustifo/ia)* Rate: 5 PLS/ft^2
10. New Mexican feathergrass *(Stipa neomexicana)* Rate: 11 PLS/ft^2

    Cool season native perennial grass, reproduces by seed and tillers, growth starts mid-spring, grows on rocky slopes.

* Black grama may be substituted for these species. Other variations and substitutions may be made based on cost and availability of seed at the time of closeout.

Seed origin and quality specifications: Seed should be harvested from native stands within 200 miles north, 300 miles south, 200 miles west and 100 miles east of Mt. Taylor. If seed from native stands is not available, seed of suitable quality grown under appropriate conditions or seed of released cultivars known to be adapted to the San Mateo area may be used. All seed must be certified, and each seed bag must have attached to it a complete label with certification information.

TABLE F.2

INITIAL INTERIM REVEGETATION SUCCESS STANDARDS

MT. TAYLOR MINE CLOSEOUT PLAN

POTENTIAL PLANT COMMUNITY FROM NRCS RANGE SITE DESCRIPTIONS

Section IIE, Technical Guide

Natural Plant Species	Percentage of Potential Production		
	Clayey Bottomland Mapping Unit 257	Bottomland Mapping Unit 57	Average
Western Wheatgrass	35-45	20-30	32
Alkali Sacaton	5-10	30-40	21
Vine Mesquite	10-15	1-5	7
Blue Grama, Spike Mulhy, Galleta	15-25	10-15	16
Bottlebrush Squirreltail	1-3	1-5	2
Fourwing Saltbush	3-10	3-10	6
Winterfat	1-3		2
Rabbitbush, Broom Snakeweed	1-5	1-5	3
Forbs	3-8	1-5	4
others	1	9	5
Ground Cover, %	50	55	52
Production, Ib./acre	1250-3200	1200-3000	2162

PROPOSED INITIAL INTERIM STANDARDS

Plant Species	Expected Percentage of Production	Standard
Western Wheatgrass	32	20-45
Alkali Sacaton	20	5-40
New Mexican Feathergrass	20	10-30
Blue Grama, Spike Mulhy, Galleta	16	10-25
Fourwing Saltbush	6	3-10
Winterfat	2	1-3
Mountain Mahogany	1	0-5
Globemallow	1	0-5
Narrowleaf Penstemon	1	0-5
others	1	0-10
Ground Cover, --- 50% of potential		
Production, Ib./acre --- 70% of potential		

Variations and substitutions may be made in the seed mix, based on seed availability and cost at time of closeout.

APPENDIX A

DRAWINGS

MT13-AC-01	General Site Plan and Drawing Index
MT13-AC-02	Mine Water Treatment Unit (MWTU) Upgrades
MT13-AC-03	MWTU Sedimentation Ponds
MT13-AC-03A	MWTU Ponds Typical Pond Layout
MT13-AC-04	MWTU - IX Plant and Radium Removal Ponds
MT13-AC-05	MWTU - Clean Water Holding Ponds and Distribution
MT13-AC-06A	Pond Liner Details-A
MT13-AC-06B	Pond Liner Details-B
MT13-AC-07	Hydraulic Control Structures Modification Details
MT13-AC-08	South Waste Rock Pile at Mine Reactivation - Plan view
MT13-AC-09	South Waste Rock Pile at Mine Reactivation - Sections
MT13-AC-10	North Waste Pile Buildout Plan View
MT13-AC-11	North Waste Pile Buildout Sections
MT13-AC-12	Ore Pad and Appurtenant Facilities - Plan View
MT13-AC-13	Ore Pad and Appurtenant Facilities - Sections
MT13-AC-14	Surface Grading and Drainage Upgrades
MT13-AC-15	Ore Pad Runoff Retention Pond
MT13-AC-16	South Storm Water Retention Pond

ADDENDUM #1 TO CLOSEOUT/CLOSURE PLAN JULY 2012 REV.1, 12/2013, AND APRIL 2013 REV.1, 11/2013

TABLE OF EARTHWORK VOLUMES NEEDED AND AVAILABLE FOR CLOSEOUT

2012 CLOSEOUT PLAN - EARTHWORK BALANCE SHEET (CLEAN SOILS)				
Fill Application or Use	Cubic Yards (CY) Needed	Borrow Source	Total Yards Available (CY)	Total Surplus Yards Remaining (CY)
Mine Water Treatment Unit Area (MWTU)				
MWTU Fill In Ponds	85749			
MWTU Fill to Grade	70546	MWTU Cut to Grade (Includes Borrow Area)	195815	
Disposal Cell Liner	3885			
Waste Pile Cover	40715	Shaft Muck Pile	33761	
Totals	**200895**		**229576**	**28681**

2013 CLOSEOUT PLAN - EARTHWORK BALANCE SHEET (CLEAN SOILS)				
Fill Application or Use	Cubic Yards (CY) Needed	Borrow Source	Total Yards Available (CY)	Total Surplus Yards Remaining (CY)
Mine Water Treatment Unit Area (MWTU)				
MWTU Fill In Ponds	170060	Soils From MWTU Pond Expansions	18744	
MWTU Fill to Grade	58195	MWTU Cut to Grade (Includes Borrow Area)	228785	
Disposal Cell Liner	2489			
Waste Pile Cover	34905	Soils From Activation Grading in South Waste Rock Area	23236	
Totals	**265649**		**270765**	**5116**

Note: If more clean soil is needed, the final grading in the borrow area can be adjusted to provide additional clean soils. In addition, borrow soil can be excavated from the N 1/2 of the NE 1/4 and the NW 1/4 of section 24, adjacent to the MWTU area. At least 300,000 CY of soil is available from these areas.

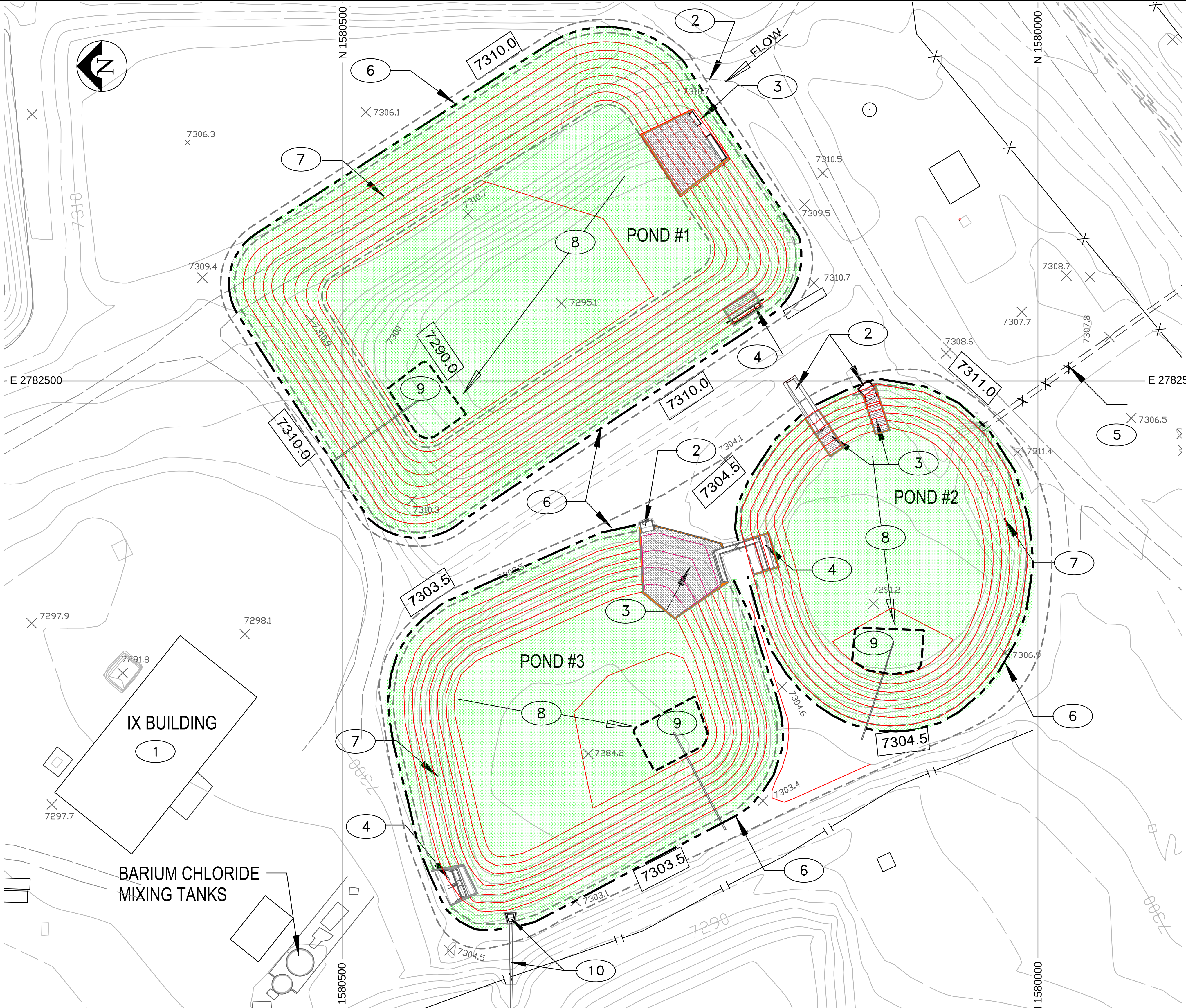
COST ESTIMATE **MT TAYLOR MINE CLOSEOUT/ DP-61 CLOSURE - NORTH WASTE PILE**

March 2014

Item #	Description	Units	$/Unit	Quantity	Cost, $	Quantity	Cost, $	Quantity	Cost, $	Quantity	Cost, $	Quantity	Cost, $	Quantity	Cost, $
				to elev 7300		7300 to 7310		7310 to 7320		7320 to 7330		7330 to 7340		7340 to 7352	
1	**Direct Reclamation Costs**														
1.4.4	**Waste Pile Buildout Stabilization (4)**														
	Top														
	Cover soil excavate, load, haul, and place	BCY	$ 4.31	26,168	$ 112,785	24,579	$ 105,936	27,252	$ 117,458	29,099	$ 125,418	25,922	$ 111,725	20,013	$ 86,255
	Cover placement	LCY	$ 1.46	30093	$ 43,936	28266	$ 41,268	31340	$ 45,757	33464	$ 48,858	29811	$ 43,524	23015	$ 33,601
	Cover grading	acre	$ 936.54	9.33	$ 8,735	8.76	$ 8,204	9.71	$ 9,096	10.37	$ 9,713	9.24	$ 8,653	7.13	$ 6,680
	Slopes														
	Cover soil excavate, load, haul, and place	BCY	$ 4.31	8,812	$ 37,980	6,721	$ 28,965	7,605	$ 32,775	8,238	$ 35,504	9,047	$ 38,994	7,359	$ 31,715
	Cover placement	LCY	$ 1.46	10134	$ 14,795	7729	$ 11,284	8745	$ 12,768	9473	$ 13,831	10404	$ 15,190	8462	$ 12,355
	Cover grading	acre	$ 936.54	3.14	$ 2,941	2.40	$ 2,243	2.71	$ 2,538	2.94	$ 2,750	3.22	$ 3,020	2.62	$ 2,456
	Erosion control mat	SY	$ 0.50	15201	$ 7,600	11593	$ 5,796	13118	$ 6,559	14210	$ 7,105	15607	$ 7,803	12694	$ 6,347
1.4.5	**Riprap and Water Bars**														
	Rock crushing	CY	$ 1.67	2608	$ 4,365	1932	$ 3,234	2186	$ 3,660	2368	$ 3,964	2601	$ 4,354	2116	$ 3,541
	Rock loading and hauling	CY	$ 8.22	2608	$ 21,434	1932	$ 15,882	2186	$ 17,971	2368	$ 19,468	2601	$ 21,381	2116	$ 17,390
	Screening	day	$ 532.20	14.90	$ 7,930	11.04	$ 5,876	12.49	$ 6,649	13.53	$ 7,202	14.86	$ 7,910	12.09	$ 6,434
	Placing channel riprap	CY	$ 28.50	74	$ 2,111										
	Placing on waste pile slope	CY	$ 25.87	2533	$ 65,541	1932	$ 49,985	2186	$ 56,559	2368	$ 61,268	2601	$ 67,290	2116	$ 54,730
1.4.6	**Finish grading**														
	North waste pile area	acres	$ 75.27	12.5	$ 938	11.2	$ 840	12.4	$ 935	13.3	$ 1,002	12.5	$ 938	9.8	$ 734
1.5	**Revegetation**														
1.5.1	Seeding	acres	$ 871.20	12.5	$ 10,861	11.2	$ 9,719	12.4	$ 10,823	13.3	$ 11,593	12.5	$ 10,858	9.8	$ 8,499
	Mulching and Fertilizing	acres	$ 1,933.63	12.5	$ 24,107	11.2	$ 21,570	12.4	$ 24,022	13.3	$ 25,731	12.5	$ 24,099	9.8	$ 18,863
1.5.2	Fencing	LF	$ 1.49	4500	$ 6,701										
TOTAL DIRECT COSTS EACH INCREMENT					**$ 372,761**		**$ 310,803**		**$ 347,571**		**$ 373,406**		**$ 365,740**		**$ 289,601**
TOTAL INDIRECT COSTS EACH INCREMENT					**$ 182,653**		**$ 152,293**		**$ 170,310**		**$ 182,969**		**$ 179,212**		**$ 141,905**
	SUM OF ALL INDIRECT = 49% OF DIRECT														
Total Direct + Indirect					**$ 555,414**		**$ 463,097**		**$ 517,880**		**$ 556,375**		**$ 544,952**		**$ 431,506**
Total Direct + Indirect, Present Cost P, Location-adjusted (0.879)					**$ 488,209**		**$ 407,062**		**$ 455,217**		**$ 489,054**		**$ 479,013**		**$ 379,294**
New Mexico Gross Receipts Tax (NMGRT)				6.6875%	**$ 32,649**		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**
Total Direct + Indirect, Present Cost P, Location-adjusted, with NMGRT					**$ 520,857**		**$ 407,062**		**$ 455,217**		**$ 489,054**		**$ 479,013**		**$ 379,294**

See Cost Estimate Rev. 1 November 2013 for descritptions of materials, cost references and quantity references

See Drawing MT13-CL-11 for increment contours and areas



NOTES

1. SEE APPENDIX D FOR IX PLANT DESIGN
2. EXISTING INLET HYDRAULIC STRUCTURES SEE SHEET MT13-AC-07
3. (A/07) NEW INLET CONCRETE CURB AND SPILLWAYS
4. EXISTING OUTLET HYDRAULIC STRUCTURE WITH NEW CONCRETE CURB AND APRON
5. 48" DIA RCP STORM WATER PIPE TO BE REMOVED– STORM WATER FLOW TO BE REDIRECTED TO SOUTH STORM WATER RETENTION POND
6. (A/06A) MINUMUM 8' WIDE LEVEL BERM AT TOP OF POND FOR ANCHORING LINER – SLOPE TOP OF BERM 1% AWAY FROM ANCHOR TRENCH
7. POND SLOPES = 3H TO 1V
8. BOTTOM OF POND SLOPE 1% TOWARDS SUMP
9. LEAK DETECTION AND COLLECTION SYSTEM SUMP AND PIPE SEE DRAWING MT13-AC-06B FOR DETAILS
10. EXISTING OVERFLOW PROTECTION PIPE 26" DIA STEEL PIPE – FLOW TO POND #4 NMDOT STANDARD CONCRETE END SECTION

LEGEND

0000.0	DESIGN ELEVATION
× 0000.0	EXISTING SPOT ELEVATION
—·—·—	TOP OF LINER – ANCHOR TRENCH
– – –	TOP AND BOTTOM OF PONDS
(green)	DOUBLE LINER AREA
(red line)	DESIGN TOPO LINES – TWO FOOT INTERVALS

NOT FOR CONSTRUCTION

MINE WATER TREATMENT SEDIMENTATION PONDS (PONDS 1, 2, AND 3)

500' GRID = NAD 83 NEW MEXICO WEST

GRAPHIC SCALE: 0 40 80 120 160 FT

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

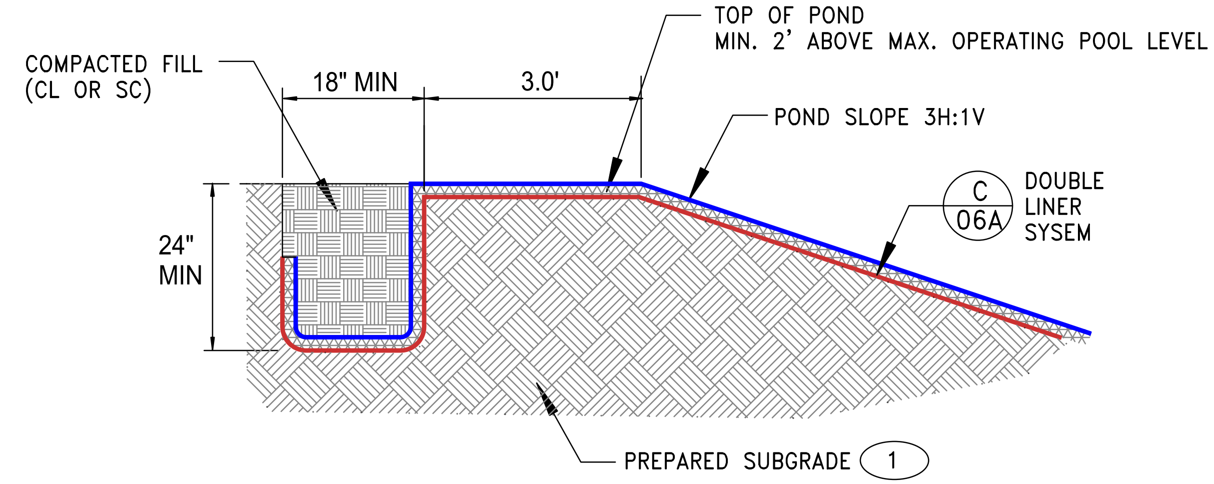
Prepared By: Alan Kuhn Associates LLC

SIZE: B | SCALE: As Shown | DWG NO. **MT13-AC-03**

PROJECT TITLE: **MT. TAYLOR MINE MINE REACTIVATION PLAN**

SHEET TITLE: MWTU SEDIMENTATION PONDS

REV: 0

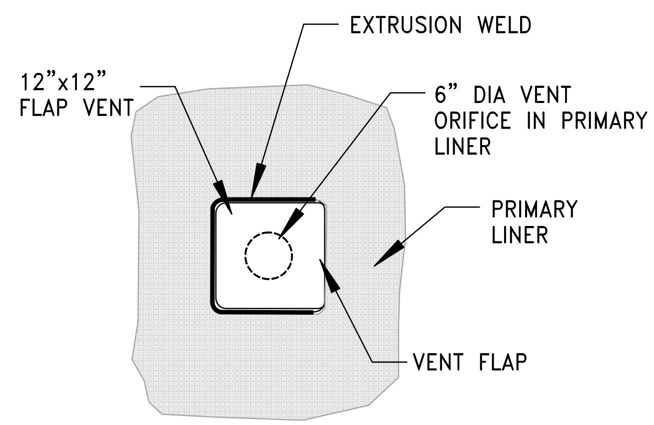


A TYPICAL INSLOPE AND ANCHOR TRENCH
NOT TO SCALE

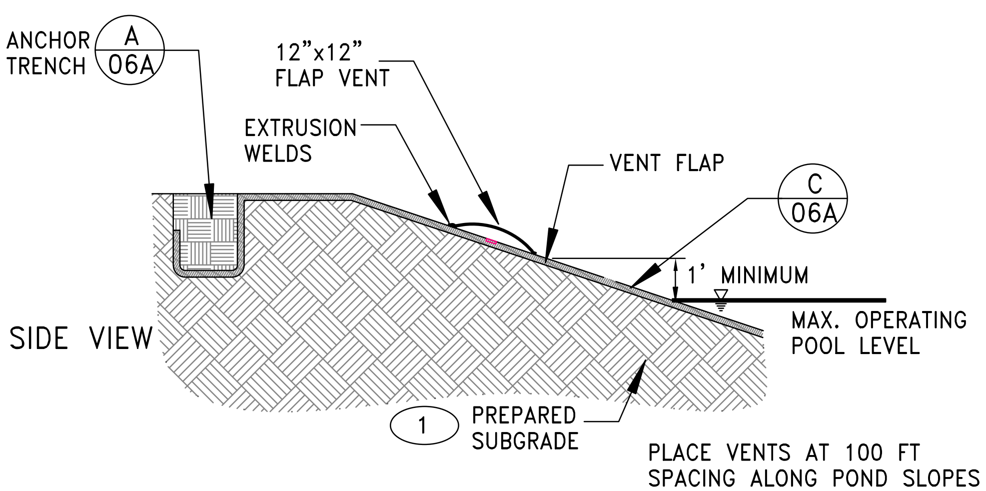
GENERAL NOTES

1. SUBGRADE TO BE GRADED AS SHOWN ON MT13-AC-03A TO PROVIDE A SMOOTH STABLE SURFACE FOR INSTALLATION OF THE LINER SYSTEM

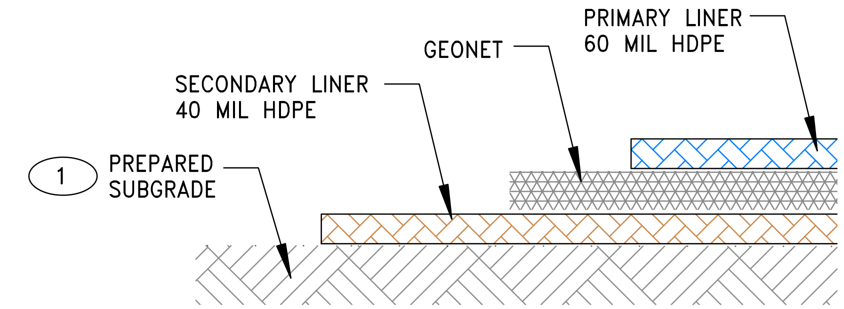
TOP VIEW



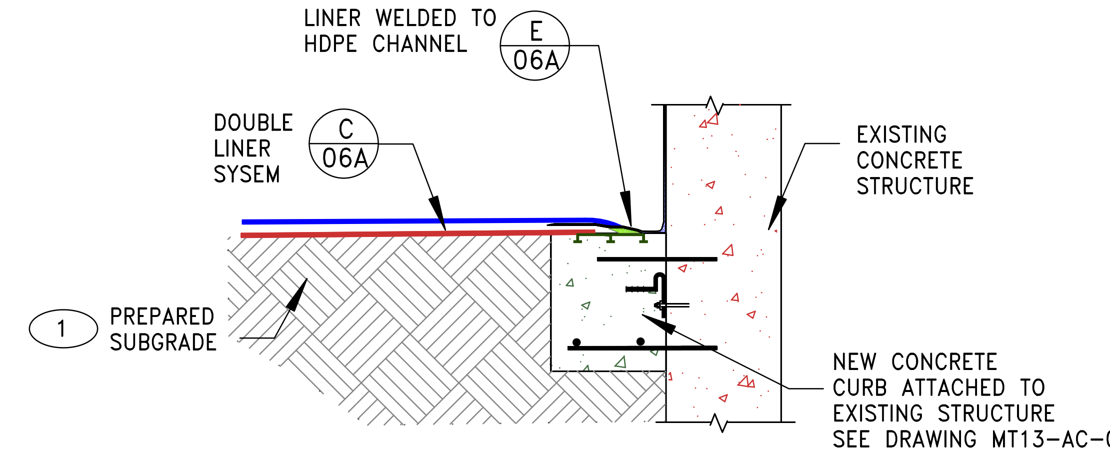
SIDE VIEW



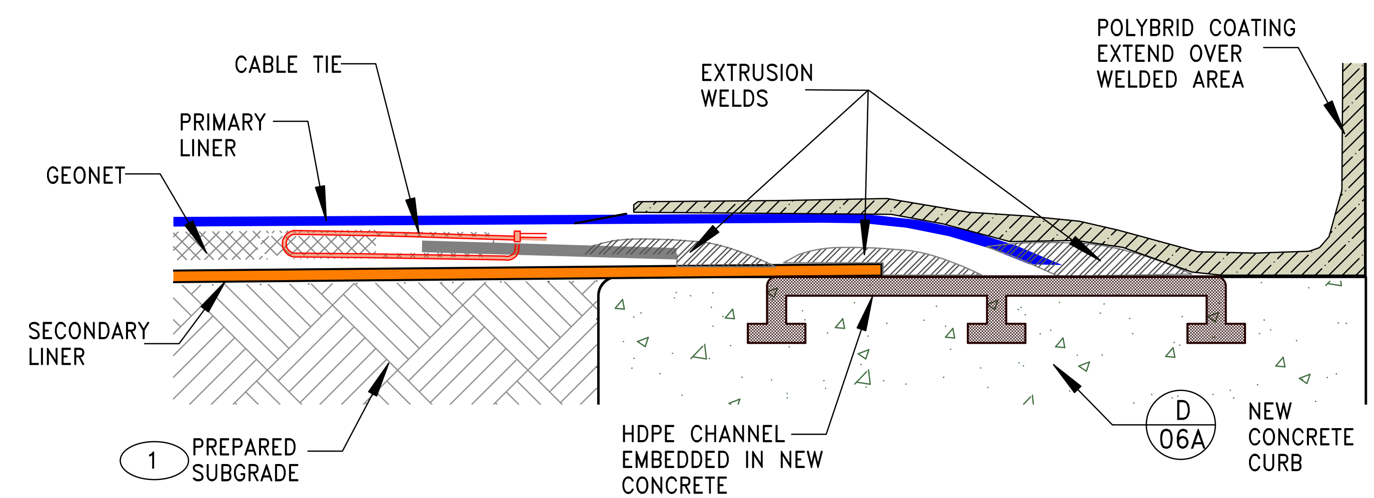
B LINER VENT DETAILS
NOT TO SCALE



C DOUBLE LINER SYSTEM
NOT TO SCALE



D LINER CONNECTION TO CONCRETE STRUCTURES
NOT TO SCALE



E LINER CONNECTION TO HDPE CONCRETE INSERT
NOT TO SCALE

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	FINAL	03-15-13	EL	AK	AK

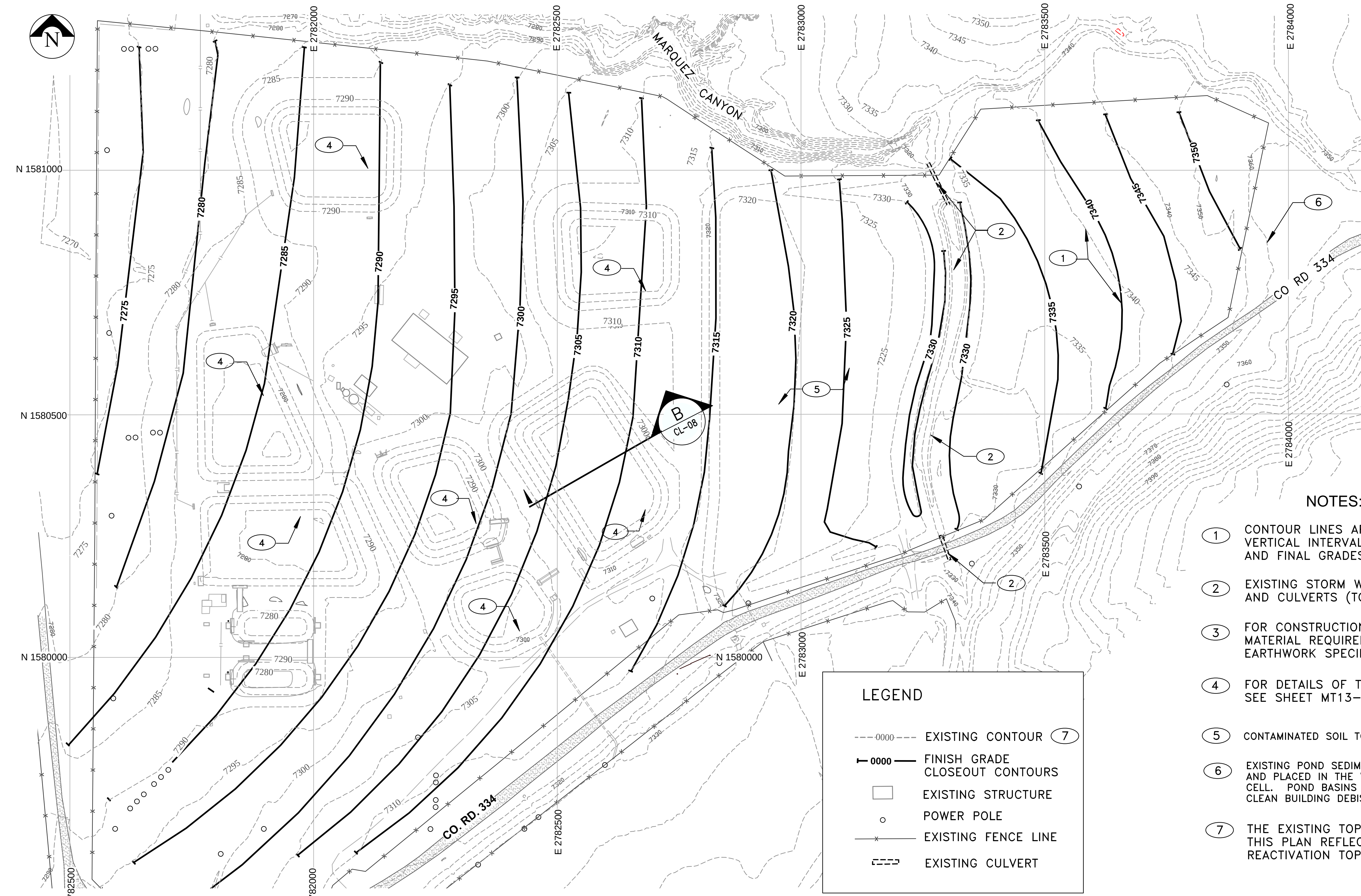
RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC	SIZE B	SCALE: Not To Scale
	DWG NO. MT13-AC-06A	

PROJECT TITLE: **MT. TAYLOR MINE MINE REACTIVATION PLAN**

SHEET TITLE: POND LINER DETAILS-A

REV 0



LEGEND

- ----0000---- EXISTING CONTOUR (7)
- ⊢0000—— FINISH GRADE CLOSEOUT CONTOURS
- EXISTING STRUCTURE
- POWER POLE
- EXISTING FENCE LINE
- EXISTING CULVERT

NOTES:

1. CONTOUR LINES ARE AT 5 FOOT VERTICAL INTERVALS FOR BOTH EXISTING AND FINAL GRADES
2. EXISTING STORM WATER DIVERSION CHANNEL AND CULVERTS (TO REMAIN)
3. FOR CONSTRUCTION, PLACEMENT, AND MATERIAL REQUIREMENTS SEE PROJECT EARTHWORK SPECIFICATION NUMBER C.4
4. FOR DETAILS OF TYPICAL POND BACKFILL SEE SHEET MT13–CL–08
5. CONTAMINATED SOIL TO BE PLACED IN WASTE PILE.
6. EXISTING POND SEDIMENTS TO BE REMOVED AND PLACED IN THE WASTE PILE DISPOSAL CELL. POND BASINS BACKFILLED WITH CLEAN BUILDING DEBIS OR CLEAN SOIL.
7. THE EXISTING TOPOGRAPHY SHOWN ON THIS PLAN REFLECTS THE POST–MINE REACTIVATION TOPOGRAPHY

FOR GRID AND SURVEY INFO SEE SHEET MT13-CL-01

0 200 400 FT
GRAPHIC SCALE

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
0	2013 REVISION	4-01-13	EL	AK	AK
1	2013 Review Comments	12-17-13	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By: Alan Kuhn Associates LLC
SIZE: B
SCALE: AS SHOWN
DWG NO. MT13-CL-07

PROJECT TITLE: **MT. TAYLOR MINE CLOSEOUT/CLOSURE PLAN**

SHEET TITLE: FINAL GRADING PLAN- MINE WATER TREATMENT POND AND ORE PAD AREAS

REV 1

APPENDIX E

Summary Report of Pipeline Outfall Investigations

Treated Mine Water Pipeline Outfall 001 at San Lucas Canyon

Mt Taylor Mine

Background

In its letter to RGR dated 8/2/2013, the Ground Water Quality Bureau of NMED provided comments on RGR's application of 4/5/2013 for revision of the Mt Taylor Mine permit to active status and modification of its Discharge Permit D-61. One of those comments stated that:

> "…NMED is concerned that ground water from renewed discharge to this outfall could exceed the current state ground water uranium standard, and possibly other promulgated ground water quality standards as well".

To address those concerns, NMED requested that RGR submit a plan for:

> "…the collection and analysis of sediment and ground water quality data at the San Lucas Canyon outfall location, as appropriate. Additionally please include monitoring well locations to monitor ground water quality and levels during the proposed discharge activities in RGRC's proposal".

In its response to NMED dated 8/29/2013, RGR proposed a plan for an outfall area investigation (Figure E-1). This Work Plan is described in the following section. Working within the constraints of weather and contractor availability, RGR conducted the field investigations and laboratory testing during September-November 2013.

Attached to this report are the Work Plan as well as data records for field investigations and laboratory testing. The following summarizes these activities and documents the results of the investigations.

Work Plan Summary

RGR submitted its WORK PLAN, INVESTIGATION OF SOIL AND GROUND WATER FOR POSSIBLE URANIUM CONTAMINATION AT MINE WATER PIPELINE OUTFALL 001, MT. TAYLOR MINE on 10/06/2013 following written and verbal comments from NMED on the draft plan submitted on 9/12/2013. This final Work Plan is attached to this report. The plan included:

- Samples of alluvial soil collected from six locations, two upstream and four downstream of the outfall, in the bottom of the arroyo at one-foot intervals to approximately 4.0 feet

- Samples of alluvial soil collected from four test borings in 5-ft. intervals at elevations deeper than the arroyo channel. One of the test borings was to be upstream of the outfall, and the others were to be downstream.
- These samples collected, logged by an RGR representative, packaged in durable plastic bags or jars, recorded on a Chain of Custody form, and delivered to a qualified analytical chemistry laboratory for testing for total U concentration using EPA Method 6010.
- If U concentrations in soil downstream indicate U contamination above background from the pre-1990 mine water discharge, leaching tests were to be performed using Synthetic Precipitation Leaching Procedure (SPLP), EPA Method 1312 to estimate how much U could be re-mobilized by the clean mine discharge water.
- Monitoring wells installed in the test borings after sampling down to bedrock, but if no water is encountered during drilling at the upstream test boring location (see Figure E-2)), no monitoring well is to be installed there. Otherwise, the #OFMW-01 monitoring well will be a background well.
- If ground water was not encountered above the top of rock in a test boring, the driller was to continue drilling 5 feet into rock or refusal.
- Each monitoring well was to be installed in accordance with the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) *Monitoring Well Construction and Abandonment Guidelines*.

The investigations were performed in conformance with this plan, with no variances other than 1) the addition of a seventh soil sampling location next to a sample location where a shallow boulder limited sampling depth, and 2) addition of three soil samples from the San Lucas sediment pond basin.

Field Investigations

Soil sampling near Outfall 001 was performed during the week of October 7, 2013. Samples were collected at OF locations listed on Table E.1 and shown on Figure E-2 at one-foot intervals using a manually-operated bucket auger. Samples were immediately placed in glass jars with lids and labeled, then recorded on field logs and chain-of-custody forms.

Test borings were drilled and monitoring wells installed during the week of October 28, 2013 at locations listed on Table E.1 and shown on Figure E-2. Drilling was attempted using air for the drilling fluid, but at shallow depths the borehole walls became unstable, requiring the driller to switch to water with biodegradable soap as the drilling fluid. The logs and construction details of the monitoring wells are shown on Figure E-3 and Figure E-4.

After the wells were evacuated of drilling fluid and developed according to the Work Plan, the wells were allowed to sit for 10 days so that natural water levels could return. The wells were measured at that time (11/11/2013) to record water levels, then sampled to collect water for testing. Only wells OFMW-03 and OFMW-4 had enough water in the well to yield a water sample.

At the request of the GWQB, an additional set of soil samples was collected for uranium content testing. Three soil samples were collect manually from 0.5-1.0 foot depth in the San Lucas sediment pond basin (Figure E-5) located at the north end of San Lucas Canyon (Figure E-1).

Laboratory Testing

Soil and water samples were tested for uranium content by Hall Environmental Analysis Laboratories Inc. (HEAL) in Albuquerque using EPA METHOD 6010B: SOIL METALS for uranium in soil and 200.8 ICPMS METALS for uranium in water. HEAL's reports are attached.

Because soil uranium concentrations were essentially background, no leaching tests were performed.

Results

Soil

The uranium content of soils sampled in the arroyo near the outfall (Figure E-2) were below detection limits (non-detect) for samples collected both upstream and downstream of the outfall with the exception of location OF-7, the northernmost sampling point, sample SS-3 at 30"-36", with uranium content of 7.1 mg/kg (ppm). This value compares to 9.96 mg/kg, the average natural uranium content of soil in the mine area.

The uranium content of soils sampled in the test borings at the monitor well locations (Figure E-2) were below detection limits (non-detect) for samples collected at locations both upstream and downstream of the outfall with the exception of location OFMW-04, the northernmost well location. In OFMW-04, the uranium content ranged from 3.4 to 14 mg/kg (ppm), compared to 9.96 mg/kg, the natural uranium content of soil in the mine area.

The uranium content of soils sampled in the San Lucas sediment pond (Figure E-5) were 12-30 mg/kg, which is slightly higher the mine-area natural background of 9.98 mg/kg and in the lower part of the range typical for volcanic and shale terrains (NMBGMR 2012).

These results show that the soils near and downstream of the pipeline outfall have not been contaminated with uranium from discharged mine water, and that the uranium values are within the range of natural uranium concentrations found in the mine area.

Ground Water

Of the four test borings drilled, only two encountered ground water. Test boring OFMW-01, upstream of the outfall, did not encounter ground water, and a monitoring well was not installed at that location.

Ground water was encountered in OFMW-03 and OFMW-04, and possibly in OFMW-02. Monitor wells were installed at those locations. Ten days after these wells were completed, the water levels were measured and samples were obtained for testing for uranium content.

The water levels from top of casing were:

OFMW-02 - 91.5 feet (total well depth 92.0 feet)

OFMW-03 – 87.6 feet (total well depth 88.0 feet)

OFMW-04 – 90.6 feet (total well depth 102.0 feet)

Although water was detected near the bottom of OFMW-02, no sample could be collected, probably because of moist sediment in the bottom 0.5 feet of the well.

Water samples were collected from OFMW-03 and OFMW-04. Uranium concentrations in the water samples were 0.0087 mg/L in OFMW-03 and 0.0027 mg/L in OFMW-04, both of which are well below the 20.6.2.3103A NMAC standard of 0.03 mg/L**.**

These results demonstrate that there is a saturated zone only at the alluvium/ bedrock contact 400 feet and further downstream of the outfall, providing only a very limited amount of ground water that could be available. The test results show that this water is not contaminated with uranium from the mine water discharge.

Future Studies

The foregoing results have addressed the GWQB concerns about impacts to ground water from mine water discharges. When RGR resumes mine water treatment, the treatment standard for uranium will be more stringent (0.03 mg/L) than the standard in place during previous operations (5 mg/L). Therefore, the cleaner future discharge will be protective of existing conditions, and no additional studies are necessary.

Once RGR resumes discharge from Outfall 001, quarterly water levels will be measured in the three wells. Annual samples of ground water will be tested for uranium.

REFERENCES

New Mexico Bureau of Geology and Mineral Resources (NMBGMR) , 2012; *Uranium - Where Is It Found?*, http://geoinfo.nmt.edu/resources/uranium/where.html

Table E.1 Outfall Area Soil Sample And Monitoring Well Location Coordinates

Point ID No.	Description	Northing	Easting	Elevation (feet)	Notes
OF-01	Soil Sample in Arroyo	1600801	2780257	7105	1
OF-02		1600854	2780432	7099	1
OF-03		1601101	2780833	7090	2
OF-04		1601211	2780938	7084	1
OF-05		1601210	2780942	7095	2
OF-06		1601419	2780968	7086	1
OF-07		1601660	2781047	7086	1
Outfall		1601020	2780747	7088	4
OFMW-01	Soil Boring	1600833	2780476	7108	5
OFMW-02	Monitoring Wells	1601073	2780925	7110	6
OFMW-03		1601250	2781000	7102	6
OFMW-04		1601914	2781403	7105	6
SLSP -01	Soil Sample in San Lucas Sediment Pond	1612626	2783429	6951	3
SLSP-02		1612772	2783457	6953	3
SLSP -03		1612912	2783602	6951	3

Notes:

1. Samples collected from the thalweg of the flow channel.
2. Sample collected from ledge above the flow channel about 5-6 feet up from the thalweg.
3. Sample collected 6 to 12 inches below the ground surface
4. The “Outfall” location is the thalweg of the arroyo where the pipe.
5. No water was encountered and no well installed. Elevation is the ground surface.
6. The elevations and coordinates of the monitoring wells are at the top of the steel well cap.

Coordinates in NAD 83 New Mexico West using a TOPCON GRS-1 hand-held GPS

Hand Auger test holes (OF-01 to OF-07) to 4’ depth

Hand Auger test holes (SLSP-01, SLSP-02 and SLSP-03) = 6 to12 inches depth.

Table 5.2 Seed Mix: Selected Species and Planting Rates

1. Western wheatgrass *(Agropyron smithii)* Rate: 9 PLS/ft^2

    Cool season native perennial grass, reproduces from seeds and rhizomes, growth starts when daytime temperatures reach 12-13 C, grows in dry, rocky soils.

2. Winterfat *(Ceratoides /anata)** Rate: 3 PLS/ft^2
3. Blue grama *(Boute/oua gracilis)** Rate: 10 PLS/ft^2

    Warm season native perennial grass, reproduces from seed, tillers, and rhizomes, growth starts May- June, grows on rock slopes.

4. Galleta *(Hilaria jamesii)* Rate: 9 PLS/ft^2
5. Alkali Sacaton *(Sporobolus airoides)* Rate: 9 PLS/ft^2
6. Mountain mahogany *(Cercocarpus montanus)* Rate: 5 PLS/ft^2
7. Fourwing saltbush *(Atriplex canescens)* Rate: 4 PLS/ft^2

    Evergreen native perennial shrub, reproduces from seeds, grows on grassy uplands, excellent reclamation species.

8. Globemallow *(Sphaeralcea fend/en)* Rate: 3 PLS/ft^2
9. Narrowleaf Penstemon *(Penstemon angustifo/ia)* Rate: 5 PLS/ft^2
10. New Mexican feathergrass *(Stipa neomexicana)* Rate: 11 PLS/ft^2

    Cool season native perennial grass, reproduces by seed and tillers, growth starts mid-spring, grows on rocky slopes.

* Black grama may be substituted for these species. Other variations and substitutions may be made based on cost and availability of seed at the time of closeout.

Seed origin and quality specifications: Seed should be harvested from native stands within 200 miles north, 300 miles south, 200 miles west and 100 miles east of Mt. Taylor. If seed from native stands is not available, seed of suitable quality grown under appropriate conditions or seed of released cultivars known to be adapted to the San Mateo area may be used. All seed must be certified, and each seed bag must have attached to it a complete label with certification information.

Table 6.2   Action Leakage Rates for Mt. Taylor Mine Ponds

	Pond 1	**Pond 2**	**Pond 3**	**Pond 4**	**Pond 5**	**Pond 8**	**Ore Pad Runoff Pond**
Pond Configuration							
Total area at bottom of pond, sq ft	38950	20070	23650	34430	35896	30580	24420
Total area at bottom of pond, ac	0.894	0.461	0.543	0.790	0.824	0.702	0.561
ALR Calculation							
Bottom liner area within 100 ft (1 % grade) of the LDCS sump, sq ft	12660	12720	10643	11450	14845	12902	12157
Geonet layer volume within 100 ft of LDCS sump, gal	1973	1982	1659	1784	2313	2011	1894
Accumulated water for 1.0 ft head on lowest point of bottom liner, gal.	1578	1586	1327	1427	1851	1608	1516
ALR, gal/ ac/ day	1765	3442	2444	1806	2246	2291	2703
ALR, gpm	1.23	2.39	1.70	1.25	1.56	1.59	1.88

ALR = accumulated water (gal.) to create 1.0 ft of head / acre water surface /day.
Bottom liner area within 100 ft (1 % grade) of the LDCS sump determined by AutoCad
Geonet is 250 mil (1/4 inch) thick. Hydraulic conductivity of 1 cm/sec and porosity of 0.8 assumed.
Ponds 6 and 7 hold clean water in single liners, so ALR is not applicable.

Table D.3.5 Mt Taylor Mine Borrow Soil Chemistry

SAMPLE			PARAMETERS														
Number	Location		pH	Ee mmhos/cm 25 C	Saturation %	Texture **	SAR	Selenium mg/kg	Boron mg/kg	Acid/Base Potential (Modified Sobek), t/Kt	Nitrate-NO, (N) mg/kg	Phosphorus (P) mg/kg	Potassium (K) mg/kg	Rock Fragments	diameter in inches		
	N	E												(% volume)	3	3-10	10+
NA1	1581458	2783393	7.6	0.5	49.9	CL	0.82	ND	0.3		5	12	690	ND	_	_	_
NA2	1581612	2782830	7.7	0.6	52.9	CL	1.31	ND	0.2		4	9	740	ND	_	_	_
BA1	1581044	2783381	7.8	0.9	37.1	L	0.95	ND	0.2		13	9	420	ND	_	_	_
BA2	1580952	2783815	7.6	1.3	40.9	L	0.25	ND	0.2		40	11	710	ND	_	_	_
BA3	1580806	2783674	7.8	0.9	38.8	L	0.32	ND	0.1	15	12	8	390	ND	_	_	_
BA4	1580479	2783379	7.7	1.2	42.8	L	0.42	ND	0.1		35	12	660	ND	_	_	_
BA5	1580734	2783546	7.8	0.9	41.3	L	0.81	ND	0.2		22	10	560	ND	_	_	_
WTP1	1580355	2782406	7.9	0.8	43.0	L	0.69	ND	0.1	16	12	8	410	ND	_	_	_
WTP2	1580975	2781891	7.9	0.9	50.4	CL	1.44	ND	0.2	16	13	7	620	ND	_	_	_
WTP3	1580070	2782240	8.0	0.8	38.7	L	1.96	ND	0.2		7	7	320	ND	_	_	_
WTP4	1580371	2782099	7.6	1.3	43.4	CL	0.44	ND	0.1		28	12	500	ND	_	_	_
WTP5	1580391	2782654	7.9	1.0	43.8	L	1.32	0.1	0.2		23	8	410	ND	_	_	_
WTP6	1580717	2782644	8.2	0.9	33.7	SL	4.79	0.3	0.1		8	7	200	ND	_	_	_
WTP7	1580905	2782465	8.0	0.4	33.0	SL	0.51	ND	ND		3	5	160	ND	_	_	_
WTP8	1580908	2782189	8.0	0.8	48.9	CL	1.56	ND	0.2		2	8	520	ND	_	_	_
WTP9	1580534	2781744	8.1	0.5	40.6	L	1.06	ND	0.1		3	9	370	ND	_	_	_
WTP10	1580249	2781742	7.9	0.9	41.8	SCL	1.32	ND	0.2		10	6	450	ND	_	_	_
WTP11	1579913	2781835	8.3	0.6	38.7	SCL	5.23	ND	0.2		4	7	240	ND	_	_	_
WTP12	1579998	2782062	8.1	0.5	40.1	L	1.16	ND	0.1		5	8	420	ND	_	_	_
SWP1	1579327	2781913	7.7	1.0	34.4	L	0.21	ND	0.1		13	6	270	ND	_	_	_
SWP2	1578943	2781711	7.9	0.6	40.5	SCL	1.37	ND	0.2		2	6	180	ND	_	_	_
SWP3	1579122	2781861	8.0	0.6	43.7	CL	1.09	ND	ND		8	8	280	ND	_	_	_
SWP4	1579061	2781581	8.1	0.6	39.6	L	1.40	ND	0.2		7	7	280	ND	_	_	_
WP1	1577958	2781874	7.9	5.3	38.9	SCL	9.35	ND	ND		2	7	110	ND	_	_	_
WP2	1577952	2781769	7.8	6.4	38.0	SL	11.60	0.2	0.1	30	2	7	90	ND	_	_	_
WP3	1577967	2781668	8.0	5.2	52.6	CL	8.31	0.1	ND		2	5	190	ND	_	_	_

** s=sand, si = silt, I= loam, c:= clay, g= gravel, cos= coarse sand, \lfs = very fine sand vfsl = very fine sandy loam, sicl = silty, clay, loam