FINAL

Conda/Woodall Mountain Mine Field-Scale Plant Uptake Pilot Study Work Plan

J.R. Simplot Company

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LIST OF ACRONYMS/ABBREVIATIONS

amsl	above mean sea level
AOC	Administrative Order on Consent
AWRMP	Area-Wide Risk Management Plan
bgs	below ground surface
BLM	Bureau of Land Management
ºC	degrees Celsius
COPC	Chemical of Potential Concern
CQC	Construction Quality Control
CQA	Construction Quality Assurance
FSPS	Field-Scale Pilot Study
GPS	Global Positioning System
IDEQ	Idaho Department of Environmental Quality
IDOT	Idaho Department of Transportation
ISDA	Idaho State Department of Agriculture
lbs-acre	pounds per acre
mg	milligrams
mg/kg	milligrams per kilogram
ODA	Overburden Disposal Area
QA/QC	Quality Assurance/Quality Control
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SOW	Statement of Work
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service

EXECUTIVE SUMMARY

This field-scale pilot study (FSPS) Work Plan has been prepared for the J.R. Simplot Company to evaluate the effectiveness of using low-selenium-accumulator plant species and soil covers to reduce plant-selenium concentrations on Overburden Disposal Areas (ODAs) at the former Conda/Woodall Mountain Phosphate Mine Site (Site).

Several studies support the finding that plant selenium uptake occurs when roots have access to plant-available selenium in the overburden material (Mackowiak and Amacher 2005, 2006a, 2006b; Mackowiak et al. 2004). The studies and Site-specific data indicate that selenium uptake varies by plant species, with selenium-accumulator plants (e.g., forbs and legumes) generally having higher uptake relative to the low-selenium-accumulator species (e.g., grasses).

Objectives - The principal study objectives are to assess:

1) The effectiveness of direct revegetation of overburden materials with low-selenium accumulating grasses in reducing average selenium concentrations in vegetation.

2) The effectiveness of soil amendment and revegetation with low-selenium accumulating grasses in reducing average selenium concentrations in vegetation growing on overburden materials.

3) The effectiveness of soil covers, where there is the potential for some plant roots to extend into overburden material, in reducing average selenium concentrations in vegetation.

4) The relationship between average selenium concentration in vegetation and root depths

5) The re-establishment rate of un-wanted species (i.e., selenium accumulating forbs and legumes).

6) The effectiveness of herbicide spraying to control the re-establishment of un-wanted species.

7) The rate of selenium transport from the overburden material into the cover system soils.

Scope - The unreclaimed overburden pile, located south of the steep overburden pile in the Pedro Creek headwaters area, will serve as the site for the FSPS (Figure ES-1). The existing vegetation on the overburden pile will be removed and the pile graded in preparation for construction of test plots. The purpose of grading is to promote drainage and facilitate uniform construction of plots which will all have an easterly-sloping aspect.

The types of treatments considered viable potential remedial options and selected for evaluation in this study are:

- Vegetated Dinwoody Formation Soil Cover;
- Direct Re-Vegetation of Overburden Material Amended with Composted Manure; and
- Direct Re-Vegetation of Overburden Material Amended with Sulfur.

The materials necessary for these potential remedial options are readily accessible in the area in sustainable quantities. Monitoring and sampling will occur both during the first-year implementation (pre-seeding; Year 0) and during subsequent growing seasons (post-seeding; Years 1 through 5).

Following construction, the FSPS area will be maintained and monitored for five growing seasons. Access to the project area will remain controlled consistent with the operations at Conda. Simplot personnel will periodically check the FSPS area to assure that it has not been altered by trespassers, wildlife, or adverse weather. Areas of erosion within the FSPS will be restored with approved soil and reseeded. The establishment of forbs, non-native, noxious species within the FSPS area will also be monitored. If necessary, herbicide will be used carefully on a spot-control basis for eradication of undesirable species. Debris will be removed from run-on and runoff control structures, and repairs will also be performed, if necessary.

The FSPS is designed to provide practical information to evaluate the relationship between selenium in the proposed reclamation vegetation with surface amendment and/or soil covers. Together with information available in literature, the FSPS data will provide the necessary input for the comparative and detailed analysis of alternatives in the FS in support of the remedy selection for Conda. If it is determined during the Conda FS that the available FSPS data is insufficient to adequately support the comparative and detailed analysis of alternatives, the Agencies may postpone finalizing the FS pending the collection of the remaining FSPS data.

1.0 INTRODUCTION

The J.R. Simplot Company (Simplot) has been sampling vegetation at the former Conda/Woodall Mountain Phosphate Mine (Conda Mine or Site) (Figure 1-1) as part of the Remedial Investigation and Feasibility Study (RI/FS), and in accordance with the January 2008 Administrative Order on Consent (AOC), the Conda RI/FS Work Plan (NewFields 2008a) and the Sampling and Analysis Plan (SAP) (NewFields 2008b). As an operator of the former Conda Mine, Simplot voluntarily entered into the AOC with the Idaho Department of Environmental Quality (IDEQ), the U.S. Environmental Protection Agency (USEPA) and the United States Department of Interior's Bureau of Land Management (BLM) (hereinafter collectively referred to as the Agencies).

Several studies support the finding that plant selenium uptake occurs when roots have access to plant-available selenium in the overburden material (Mackowiak and Amacher 2005, 2006a, 2006b; Mackowiak et al. 2004). The studies and Site-specific data indicate that selenium uptake varies by plant species, with selenium-accumulator plants (e.g., forbs and legumes) generally having higher uptake relative to the low-selenium-accumulator species (e.g., grasses).

The preliminary RI findings indicate that plants growing on the overburden disposal areas (ODAs) can have elevated concentrations of selenium that potentially pose unacceptable risks to livestock and wildlife receptors via the plant-intake exposure route. The Site-specific potential for adverse effects to livestock receptors will be assessed as part of the risk assessment process (separate from the standard ecological risk assessment). Depending on the findings of that assessment, it may be necessary to evaluate remedial alternatives to reduce the average selenium concentration in forage vegetation growing on ODAs to levels that provide protection for livestock and wildlife. Remedial alternatives may include direct revegetation of the ODAs with low-selenium accumulating species, or through placing soil covers atop the ODAs and revegetating with low-selenium accumulating species. To evaluate the effectiveness of using low-selenium-accumulator plant species and soil covers to reduce plant-selenium concentrations on ODAs, additional data on the relationship between uptake by these species and overburden/cover material is needed.

This Work Plan outlines a field-scale pilot study (FSPS) that would provide the basis for further understanding selenium uptake by low-selenium-accumulator species.

1.1 Pilot Study Description

Although revegetated soil covers have been shown to be the preferred means for reducing selenium concentrations in vegetation, their use may not always be the most cost-effective option at inactive mines. Topsoil with adequate properties for use in reclamation is a limited resource at most inactive mine sites, and typically needs to be removed from previously undisturbed areas. Therefore, during the process of selecting appropriate cover systems it is important to consider the potential environmental impacts of obtaining the necessary cover-soil volumes in previously undisturbed borrow areas.

This FSPS will evaluate selenium uptake in low-selenium-accumulating plant species growing:

- directly on seleniferous overburden materials;
- on sulfur-amended seleniferous overburden materials;
- on composted-manure-amended seleniferous overburden materials; and
- on soil covers of various thicknesses.

The FSPS is designed to provide practical information to evaluate the relationship between selenium in the proposed reclamation vegetation with surface amendment and/or soil covers. The FSPS will also provide information on management of unwanted plant species. It is anticipated that the FS would conclude prior to the completion of the 5-year long FSPS. The information obtained from the FSPS, together with information available in literature, will provide the necessary input for the comparative and detailed analysis of alternatives in the FS in support of the remedy selection for Conda. If it is determined during the FS that the available FSPS data is insufficient to adequately support the comparative and detailed analysis of alternatives, the Agencies may postpone finalizing the FS pending the collection of the remaining FSPS data. The FSPS will also provide useful information to aid in remedy design and implementation.

Conducting the FSPS is expected to contribute to the overall improvement of current Site conditions. Details on the study objectives and experimental design are presented in the following sections.

1.2 Document Organization

This report is organized as follows:

- Section 1 – Introduction: A general description of the rationale for the FSPS.
- Section 2 – FSPS Area Physical Setting and Characteristics: A description of the FSPS setting.
- Section 3 – Study Objectives, Technology Screening, and Relevant Studies: A summary of the study objectives, technologies used to reduce plant uptake of selenium, and relative study findings.

- Section 4 – Experimental Design and Implementation: A description of FSPS area preparatory activities and details of the study design and a summary of operation and maintenance.

- Section 5 – Sampling and Analysis: A summary of monitoring and sampling activities.

- Section 6 – Data Analysis and Reporting: A description of the data analysis and result reporting.

- Section 7 – Schedule: A general summary of the project timeline.

- Section 8 – References: A summary of references cited.

2.0 FSPS AREA PHYSICAL SETTING AND CHARACTERISTICS

Simplot will use a previously un-reclaimed overburden pile located in the Pedro Creek drainage as the FSPS area (Figure 2-1). The pile covers approximately 7 acres, with elevations ranging from about 6,823 feet above mean sea level (amsl) to 6,953 feet amsl. The pile currently has a predominantly flat top-area, steep side slopes (1.5[horizontal]:1[vertical]), and is sparsely vegetated. A new road to access the FSPS area will be constructed (Figure 2-1). The road will be on Simplot land, and will be constructed along a former haul road. This road would also be used to provide access for activities related to the potential Removal Action at the main Pedro Creek overburden pile.

The overburden materials in the pile are generally coarse grained rock consisting of Rex Chert, Mudstone, Middle Waste Shale, and some Limestone. Samples collected from the pile (Figure 2-1) as part of the RI/FS indicate that selenium concentrations in the overburden material (including all depth ranges from surface to 12 inches below ground surface [bgs]) range from 38 to 739 mg/kg, with an average concentration of 214 mg/kg (Table 2-1). Plant species that have naturally populated the overburden pile include, but are not limited to, western wheatgrass (*Pascopyrum smithii*), sagebrush *(Artemisia tridentata),* thickspike wheatgrass *(Elymus macrourus),* yarrow *(Achillea millefolium)* and leafy aster *(Aster foliaceus)*. Selenium concentrations in vegetation growing on the overburden material ranged from 0.3 mg/kg to 555 mg/kg, with an average concentration of 100 mg/kg (Table 2-1).

Photographs showing the features of the overburden pile are included in Appendix A. Additional background information for the area is available in the Conda RI/FS Work Plan (NewFields 2008a).

3.0 STUDY OBJECTIVES, TECHNOLOGY SCREENING, AND RELEVANT STUDIES

3.1 Pilot Study Objectives

The principal FSPS objectives are to assess:

1) The effectiveness of direct revegetation of overburden materials with low-selenium accumulating grasses in reducing average selenium concentrations in vegetation.

2) The effectiveness of soil amendment and revegetation with low-selenium accumulating grasses in reducing average selenium concentrations in vegetation growing on overburden materials.

3) The effectiveness of soil covers, where there is the potential for some plant roots to extend into overburden material, in reducing average selenium concentrations in vegetation.

4) The relationship between average selenium concentration in vegetation and root depths

5) The re-establishment rate of un-wanted species (i.e., selenium accumulating forbs and legumes).

6) The effectiveness of herbicide spraying to control the re-establishment of un-wanted species.

7) The rate of selenium transport from the overburden material into the cover system soils.

3.1.1 Data Quality Objectives

The following subsections describe the types and quality of data needed to support the FSPS, and is modeled after USEPA's guidance for application of their Data Quality Objectives process (USEPA 2006).

3.1.1.1 Principal Study Question

Reclaimed ODAs at Conda, containing various amounts of seleniferous and non-seleniferous material, currently support growth of vegetative species that, through direct uptake, can have elevated selenium concentrations relative to levels in native areas. In many cases, the selenium concentration in vegetation exceeds levels that are considered acceptable for livestock and wildlife.

The principal study question is:

Do low-selenium-accumulating species adequately reduce average selenium concentrations in plants growing directly on overburden materials or on relatively thin cover systems atop overburden materials, or are thicker cover systems necessary to adequately reduce average selenium concentrations in plants?

3.1.1.2 Data Inputs to the Decision and Decision Rules

In order to evaluate whether direct revegetation with low-selenium-accumulator species reduces average selenium concentrations in plants growing atop ODAs, the following inputs are needed and rules apply.

Decision Input Data:

- Selenium concentrations in vegetation directly growing on seleniferous overburden material that has been revegetated with a mixture of low-selenium-accumulator species;
- Selenium concentrations in low-selenium-accumulator species vegetation directly growing on Sulfur-amended seleniferous overburden material; and
- Selenium concentrations in low-selenium-accumulator species vegetation directly growing on cover material, where there is a potential for the predominant root zones to extend beyond the cover into the seleniferous overburden material.

Decision Rules:

- If average selenium concentrations in composite vegetation samples of low-selenium-accumulator species growing directly on overburden material at the FSPS do not meet criteria to be identified as acceptable in the Conda specific Risk Assessment, then direct revegetation with low-selenium-accumulator species is not an appropriate option;
- If average selenium concentrations in composite vegetation samples growing directly on sulfur-amended overburden material do not meet criteria to be identified as acceptable in the Conda specific Risk Assessment, then direct revegetation with low-selenium-accumulator species on sulfur-amended overburden is not an appropriate option;
- If average selenium concentrations in composite vegetation samples growing directly on composted-manure-amended overburden material do not meet criteria to be identified as acceptable in the Conda specific Risk Assessment, then direct revegetation with low-selenium-accumulator species on composted-manure-amended overburden is not an appropriate option; and

- If average selenium concentrations in composite vegetation samples growing on soil-covered overburden material of a certain thickness do not meet criteria to be identified as acceptable in the Conda specific Risk Assessment, then placement of a cover of that particular thickness is not an appropriate option and a thicker cover may be necessary.

3.1.1.3 Limits on Decision Errors

The principal null hypothesis for this FSPS is that average selenium concentrations in low-selenium-accumulator vegetation growing directly on overburden material, on amended overburden material, or on soil covers do not meet criteria to be identified as acceptable in the Conda specific Risk Assessment. The alternative condition is that selenium concentrations in the aforementioned options do meet criteria to be identified as acceptable in the Conda specific Risk Assessment.

There are two types of decision errors, classified as a false rejection error (Type 1) and a false acceptance error (Type 2). A Type 1 error is determining that average selenium concentrations meet the acceptable average selenium concentrations, indicating that these options are effective in reducing risk to ecological receptors from plant ingestion, when in fact they do not meet acceptable levels and therefore do not provide for risk reduction. A Type 2 error is determining that average selenium concentrations do not meet the acceptable average selenium concentrations, indicating that these options are not effective in reducing risk to ecological receptors from plant ingestion, when in fact they do meet acceptable levels and therefore do provide for risk reduction. A Type 1 error may result in continued potential adverse risk from plant ingestion. A Type 2 error may result in unnecessarily expensive treatments to reduce risks from plant ingestion.

To control decision errors, only quantitative data with acceptable accuracy and precision documentation will be used for comparison. Samples will be analyzed using USEPA-approved methods with detection limits below the 5 mg/Kg guidance. Sample locations will be based upon a number of randomly selected locations sampled annually that represent the natural variability in conditions spatially and temporally. Measurement errors will be minimized by implementing standard operating procedures (SOPs) for the sample collection, handling, preparation and analysis methods (Appendix B).

3.1.1.4 Optimizing the Study Sampling Design

The FSPS objective will be reviewed as additional data is collected. The sampling design and strategy are presented in Section 4, with the sampling and quality assurance (QA) and quality control requirements discussed in Section 5. Additional samples may be collected during the FSPS, if and as necessary to increase the confidence of the decision.

3.1.1.5 Special Training Needs/Certification

All personnel conducting sampling activities must be 40-hour Hazardous Waste Operation (HAZWOPER) trained per 29CFR 1910.120 and be current with their annual 8-hour refresher course. In addition, all personnel conducting the sampling activities must follow the Conda Health and Safety Plan (Appendix C).

3.2 Technologies Reducing Selenium Plant Uptake

The types of technologies used in remedial actions to reduce the plant-selenium concentrations on overburden piles generally are limited to cover soil placement (e.g., placement of clean soil with or without a capillary break layer), soil amendment (to reduce the plant-available selenium for uptake), and species modification (e.g., broadleaf herbicide application to remove existing selenium accumulating forbs and legumes, and seeding with low-selenium-accumulating grasses).

Cover Soil Placement – As previously mentioned, cover placement been shown to be the preferred means for reducing selenium concentrations in vegetation. The availability of soil cover material (e.g., Salt Lake Formation and Dinwoody Formation) at Conda with adequate properties for use in reclamation (i.e., low transmissivity and good growth medium) is limited. The Salt Lake Formation, being a layered conglomerate, can vary significantly in its properties and generally has less dense natural vegetative growth based on observations at the Site. The weathered portion of the Dinwoody Formation is less variable, relative to the Salt Lake Formation, and based on Site observations tends to have better plant coverage.

Simplot's experience at Smoky Canyon Mine is that the Dinwoody Formation has adequate agronomic properties to be a good growth medium with the proper fertilizer and amendments. Simplot's experience is also that The Dinwoody Formation when used as a cover provides significant moisture retention and reduced permeability. The 2-feet Dinwoody cover on panel E placed by scrapers produces significant runoff during spring runoff and high rainfall events. Although a cover built out of Dinwoody Formation material at Conda may have slightly different properties (e.g., grain size distribution, moisture content, and hydraulic conductivity) than the Dinwoody Formation covers at Smoky (Table 3-1), it is expected to perform similar to the Dinwoody Formation covers at Smoky.

The Dinwoody Formation material at Conda would have to be removed from undisturbed areas, resulting in the potential for effects to the environment, and additional areas (borrow areas) needing to be reclaimed.

Soil Amendment – The bioavailability of selenium in soil is dependent on redox potential and pH, microorganisms present and activity, the presence of electron donors and acceptors, sorbents such as mineral surfaces or soil organic matter, and the presence of competing ions such as sulfate, phosphate, and organic acids (Oram et al. 2010). Soil amendments can reduce the bioavailability of selenium for plant uptake while enhancing revegetation success. Materials which can be used to reduce the plant-available-selenium may be inorganic (e.g., sulfur) or organic (e.g., manure, compost, and biosolids).

Species Modification – Species modification reduces the amount of selenium accumulating species growing on the overburden material, therefore reducing the average selenium concentrations in the plant population on overburden piles.

3.3 Technologies Selected for Evaluation

The types of treatments considered viable potential remedial options and selected for evaluation in this study are:

- Vegetated Dinwoody Formation Soil Cover;
- Direct Re-Vegetation of Overburden Material Amended with Composted Manure; and
- Direct Re-Vegetation of Overburden Material Amended with Sulfur.

The materials necessary for these potential remedial options are readily accessible in the area.

Weathered Dinwoody Formation Properties - The Dinwoody Formation typically weathers into silty-clay sandy soils with low transmissivity. The weathered Dinwoody Formation at Conda is primarily fine-grained consisting of sandy silt, clayey gravel with sand and sandy clay. The percentage of fines (passing a No. 200 sieve) ranges between 19 to 77 percent (Table 3-1). The organic content of the weathered Dinwoody Formation material at Conda ranged from 3 to 8 percent. The dry density of the weathered Dinwoody Formation materials at Conda ranged between 95 and 116 pounds per cubic foot (pcf) with moisture content ranging between 13 and 68 percent. The Atterberg Limits tests of the weathered Dinwoody Formation materials indicate low to moderate plasticity, with plasticity indices (PIs) varying from approximately 1 to 43 (Table 3-1).

The moisture retention, low transmissivity, and adequate organic content make the weathered Dinwoody Formation the most suitable soil-cover material available at Conda. During precipitation events the near-surface weathered Dinwoody Formation material is expected to quickly become saturated due to the moisture retention capacity, resulting in surface runoff. This reduces infiltration into the overburden material during periods of snow melt or high precipitation. It anticipated that the transmissivity of the Dinwoody Formation layer will continue to decrease as the material weathers further.

3.4 Relevant Plant Uptake Studies

Several plant uptake studies have been performed in the area. The studies relevant to the Conda FSPS and their findings are summarized below.

3.4.1 Tailings Impoundment Material Greenhouse Plant Uptake Study – Smoky Canyon Mine

A greenhouse study was initiated in June 2004, under the 2003 AOC entered between Simplot, IDEQ, USFS, and USEPA, to evaluate both productivity and selenium uptake of different grasses growing in amended Smoky Tailings Impoundment material. The greenhouse study evaluated four grasses growing on tailings material treated with various mixtures of organic amendment (cow manure) and soil. The grasses evaluated were: big bluegrass (*Poa ampla*), bluebunch wheatgrass (*Pseudoroegneria spicatum*), Great Basin wildrye (*Elymus cinereus*) and Idaho fescue (*Festuca idahoensis*). Main treatments included tailings only, 6 inch soil cover over 18 inches of tailings, 12 inch layer of tailings mixed with soil (50:50 and 75:25) over 12 inches of tailings, and soil control (24 inches of soil). All treatments included the addition of inorganic fertilizer (nitrogen, phosphorus and potassium).

Selenium concentrations in cover materials from this study ranged from 13.9 to 24.7 mg/kg in the tailings, and 0.04 to 0.09 mg/kg in the topsoil. Selenium concentrations in the mixtures of the tailings material and topsoil ranged from 6.4 to 9.9 mg/kg (50:50) and 12.4 to 15.2 mg/kg (75:25). At the end of 120 days of growth, selenium concentrations ranged from 8.2 to 23.7 mg/kg in plants growing on tailings mixtures and 0.07 to 0.16 mg/kg in plants growing in soil control treatments (Table 3-2).

The results of the greenhouse study clearly show that the addition of organic amendment (as cow manure) results in lower concentrations of selenium in plant tissue among the plant species tested (NewFields and Redente 2005). Vegetation from treatment plots without manure amendment consistently had selenium concentrations that exceeded the 5 mg/kg level (Table 3-2).

3.4.2 Pole Canyon Overburden Greenhouse Plant Uptake Study – Smoky Canyon Mine

A greenhouse study was initiated in June 2006, under the 2003 AOC entered between Simplot, IDEQ, USFS, and USEPA, to evaluate both productivity and selenium uptake of different grasses growing in amended Pole Canyon overburden material. The selenium concentrations in the overburden material ranged between 3.3 mg/kg to 7.9 mg/kg. The greenhouse study evaluated four grasses growing on overburden material treated with various rates of organic amendment (cow manure) and inorganic fertilizer (nitrogen, phosphorous and potassium). The selenium concentrations in the amended overburden material ranged between 4 mg/kg and 5.6 mg/kg. The grasses evaluated were: slender wheatgrass (*Elymus trachycaulus*), bluebunch wheatgrass, Great Basin wildrye, and mountain brome *(Bromus marginatus)*. These species are native to North America, are known to grow in the environmental conditions of the Smoky Canyon mine site, and are not considered to be selenium accumulators.

Selenium concentrations in plant tissue were determined at the end of 60 and 120 days of growth (Table 3-3). The results from this analysis were interpreted within the context of the guidelines developed by the United States Department of Agriculture Forest Service (USFS) that restrict the use of soils that would yield vegetation with selenium concentrations that exceed 5 mg/kg (dry weight). The guidelines are based on Dr. Michael Amacher's (USFS Rocky Mountain Research Station Forestry Sciences Laboratory in Logan Utah) studies (Mackowiak and Amacher 2005).

The results of the greenhouse study clearly show that the addition of manure as an overburden amendment results in lower concentrations of selenium in plant tissue among the plant species tested. In the unamended overburden control (Treatment 1), Great Basin wildrye accumulated selenium at concentrations that exceeded 5 mg/kg (dry weight) at the end of the 60-day growth period (first harvest). This was the only exceedence. In general, selenium concentrations declined with increasing amounts of manure and fertilizer compared to unamended overburden. However, in most cases these differences were not statistically different (NewFields 2007).

3.4.3 Tailings Impoundment Field-Scale Pilot Study – Smoky Canyon Mine

A field-scale pilot study is currently in progress at the Smoky Tailings Impoundments, as part of the 2003 AOC entered between Simplot, IDEQ, USFS, and USEPA. This study is based on a scope of work presented in the Final Pilot Study Work Plan for Revegetation of Tailings at the Smoky Canyon Mine (NewFields and Redente 2006). As described in the Work Plan, this long-term (5 year) study augments the findings of the greenhouse study using the Smoky Canyon Mine Tailings Impoundments material (NewFields and Redente 2005) (Section 2.2.1).

The study is comprised of 12 test plots in a demonstration cell that covers approximately 5 acres. Treatments include combinations of heavy (60 dry tons/acre)/light (40 dry tons/acre) manure amendment, heavy (20 dry tons/acre)/light (10 dry tons/acre) wood amendment, straw amendment (2.5 tons/acre), and till depths (8 inches or 19 inches), or no amendment/till. Each plot measures 70 feet x 100 feet, with buffer zones between plots. A seed mix of 9 species, comprised of mountain brome, bluebunch wheatgrass, slender wheatgrass, western wheatgrass, Idaho fescue, sheep fescue (*Festuca ovina*), Great Basin wildrye, western yarrow, and small burnet was used in all 12 test plots.

Selenium concentrations from the tailings materials in the two FSPS test plots without amendments (July 2007 – first growing season after planting fall 2006) ranged from 12.6 to 15.8 mg/kg and from 11.0 to 14.3 mg/kg in tailings materials with amendments. Average selenium concentrations in seeded plant species over four years of monitoring have been well below 1.0

mg/kg. The highest plot average selenium concentration in seeded species was 0.72 mg/kg in 2007, 0.26 mg/kg in 2008, 0.3 mg/kg in 2009, and 0.85 mg/kg in 2010. Although total selenium concentrations in the tailings substrate marginally exceeded the USFS recommended level of 13 mg/kg in soils used in reclamation (based on Dr. Michael Amacher's studies [Mackowiak and Amacher 2005]), the selenium accumulation in both seeded and non-seeded vegetation remained minimal.

To date, the tailings FSPS study has demonstrated that test plots with organic amendments have better coverage by seeded vegetation compared to test plots without any amendments (Table 3-4). Overall, it appears that all of the amended treatments have been successful in producing sustainable coverage of desired species with low selenium concentrations, with some slight differences between the treatments that will be evaluated further during the next monitoring event. Additional long-term sampling would be needed to determine whether the one-time organic amendments continue to reduce selenium plant uptake over the long run.

3.4.4 Sulfur Amended Soil Plant Uptake Study

A greenhouse study was performed to evaluate the effect of sulfur amendments to suppress plant uptake of selenium from seleniferous shale (Mackowiak and Amacher 2008). The study evaluated selenium uptake by alfalfa (*Medicago sativa*) and western wheatgrass growing on a 50:50 mixture of soil and waste shale. The waste shale was collected from an exposed outcrop of the Meade Peak Member of the Phosphoria Formation at Maybe Canyon Mine, southeast Idaho. The topsoil was collected from an unmined area in nearby Dry Valley, Idaho. The 50:50 soil/waste shale mixture was amended with 0, 0.5, 1.0, or 2.0 Megagrams (Mg) of sulfur per hectare. The sulfur was either elemental or gypsum.

Dry mass and tissue selenium were monitored over several clippings at 51, 86, 110, 135, 166, 197, and 226 days after planting. Soils were sampled at the conclusion of the study and analyzed for water-soluble selenium, oxalate-extractable selenium, and total selenium. Sulfur amendments as either elemental sulfur or gypsum at 1.0 Mg per hectare or greater equally suppressed selenium uptake over 60 percent in both forage species. Alfalfa accumulated more selenium than western wheatgrass. Plant removal via successive clippings resulted in lower tissue selenium accumulation over time than the use of sulfur amendments alone. Alfalfa-planted soils contained lower water-soluble and oxalate-extractable selenium than did the non-planted controls while western wheatgrass-planted soils contained lower water-soluble selenium compared to alfalfa. The study concluded that applying sulfur to shale-based soils may be an economically viable option for treating selenium-impacted, revegetated lands (Mackowiak and Amacher 2008).

3.4.5 Plant Uptake of Selenium from Sedimentary Soils

Studies of soil and vegetation collected from phosphate mine sites in southeast Idaho (Mackowiak and Amacher 2005) included analyses of soils with selenium concentrations up to 50 mg/kg selenium dry weight. Plant species were also collected at the same locations as the soil samples for selenium analysis to evaluate the correlation between soil and plant selenium levels. Empirical observations of selenium uptake from soil by plants indicate that (1) below a threshold soil selenium concentration of 10 - 15 mg/kg, plant uptake of selenium is unrelated to the total selenium content of soil, and (2) oxalate-extractable selenium can serve as an indicator of plant uptake of selenium. The following recommendations were made based on the findings of these studies (Mackowiak and Amacher 2005):

- Disturbed soils with total selenium levels below 13 mg/kg are acceptable to use as waste rock dump covers without further testing.
- Soils with total selenium levels above 50 mg/kg or oxalate-extractable selenium levels above 1.5 mg/kg should never be used as waste rock dump covers, because even in an undisturbed state on the landscape they have plant selenium concentrations in excess of 5 mg/kg.
- Undisturbed soils with total selenium levels between 13 and 50 mg/kg should be tested for plant uptake of selenium to determine if these are suitable for use as cover materials. A protocol for soil testing has been developed (Mackowiak et al. 2004).
- Consider blending high with low selenium soils to bring the total selenium level of the blended soil to less than 13 mg/kg.

4.0 EXPERIMENTAL DESIGN AND IMPLEMENTATION

The following subsections describe the FSPS setting and present the various elements of the study design and implementation.

4.1 Setting

As previously mentioned, the unreclaimed overburden pile, located south of the steep overburden pile in the Pedro Creek headwaters area, will serve as the location for the FSPS (Figure 2-1). The overburden pile will be graded to a 3:1 slope in preparation for construction of the test plots described below. The purpose of grading is to create approximately an 8-acre area (Figure 4-1) and facilitate the uniform construction of the test plots. Best Management Practices (BMPs) consisting of run-on and runoff control ditches, sedimentation basin, anchored straw bales, silt fences, erosion-control wattles, and hydromulch will be used to minimize releases during construction activities, as discussed in Section 4.3.

4.2 Study Design

The study consists of seven cover systems, replicated three times in a randomized design (Figure 4-2). Therefore, a total of twenty-one test plots (approximately 60 by 90 feet) will be constructed on the easterly sloping portion of the regraded overburden pile (Figure 4-2). There will be a 10- to 15-foot wide buffer strip between the plots. The 10-15 feet wide buffer zones will be used to uniformly transition slope changes between plots to allow for proper drainage and prevent cross contamination. In addition, swales and erosion-control wattles will be used to prevent cross contamination of plots due to runoff from adjacent plots.

Each test plot will be seeded with low-selenium-accumulating grasses described in Section 4.2.2, below. The plots will be irrigated if necessary using water trucks and movable high-volume sprinklers. However, considering that seeding would likely occur in the fall, most of the moisture is expected to come from rainfall. At the completion of construction activities, signs (constructed of weather resistant material) will be installed at each plot as a permanent marker. Table 4-1 presents a summary of the test plots and the rationales.

4.2.1 Surface Substrate

The following paragraphs describe the six cover systems evaluated.

Direct Revegetation of Un-Amended Overburden (Control) – Test plots 9, 12 and 20 (Figure 4-2) will be revegetated with low-selenium-accumulating grasses without amending the substrate following regrading.

Direct Revegetation of Sulfur-Amended Overburden – Test plots 13, 16 and 18 (Figure 4-2) will be amended with sulfur prior to revegetation, through the addition of elemental sulfur. The elemental sulfur will be applied at a conservative rate of 2,500 pounds/acre and mixed/tilled into the overburden material.[1] The elemental sulfur will be applied on a volume basis, as uniformly as possible across the surface.

Direct Revegetation of Composted-Manure-Amended Overburden – Test plots 11, 17 and 21 (Figure 4-2) will be amended with composted manure prior to revegetation. The plots will be conservatively treated with 60 tons/acre of composted-manure, tilled to a depth of 18 inches.[2]

12 Inches of Vegetative Soil Cover – Test plots 6, 10 and 14 (Figure 4-2) will be covered with 12 inches of weathered Dinwoody Formation soil and revegetated. The 12-inch cover represents the minimum depth of Dinwoody Formation cover considered viable, if direct revegetation is proven to be ineffective. The 12-inch cover would result in the least amount of disturbance to habitat in the borrow areas.

18 Inches of Vegetative Soil Cover – Test plots 5, 7 and 19 (Figure 4-2) will be covered with 18 inches of weathered Dinwoody Formation soil and revegetated. The 18-inch cover is considered the next cover thickness that could be used for potential response action with a reasonably acceptable amount of disturbance to habitat in the borrow areas. Continued increase in Dinwoody cover thicknesses would result in larger areas where habitat would be disturbed to obtain the material.

18 Inches of Vegetative Soil Cover with a 12 inch Capillary Break – Test plots 1, 3 and 15 will be covered with 18 inches of weathered Dinwoody Formation soil atop a twelve-inch capillary break layer. The capillary break layer will consist of Rex Chert or Wells Formation rock up to approximately 6-inches in size. The Rex Chert is available in previously disturbed areas and its addition to increase the cover thickness would not result in additional disturbance of habitat.

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[1] Elemental sulfur and gypsum were equally effective in suppressing Se uptake over 60% for wheatgrass and over 70% for alfalfa, when the materials were incorporated into the shale/soil substrate. The initially larger suppression of Se uptake by adding 1 Mg sulfur ha^{-1} compared to 0.5 Mg ha^{-1} sulfur leads to a recommendation of 1 Mg sulfur ha^{-1} as either elemental sulfur or gypsum to suppress Se uptake. Increasing the rate to 2 Mg sulfur ha^{-1} did not seem to have an additional effect (Mackowiak and Amacher 2008).

[2] Results indicate differences between treatments (e.g., heavy wood in addition to heavy manure appears to have yielded greater vegetation cover, test plots with straw addition have more dominance by yarrow) (Formation 2010).

24 Inches of Vegetative Soil Cover with a 24 inch Capillary Break – Test plots 2, 4 and 8 will be covered with 24 inches of weathered Dinwoody Formation soil atop a 24-inch capillary break layer. The 4-foot cover will allow for the comparison of the proposed covers/treatments with the most viable robust cover that would not result excessive disturbance of habitat to obtain the cover material.

The weathered Dinwoody soil cover material and the Rex Chert rock will be obtained from borrow areas located on Simplot land approximately 1.5 miles south of the FSPS area (Figure 4-3). The Wells Formation rock for the capillary break layer will be obtained from an adjacent pit wall (Figure 4-3). Table 3-1 presents a summary of the geotechnical properties of the Dinwoody and Rex Chert in the borrow areas. The material ultimately used for a capillary break, the weathered Dinwoody Formation and the overburden material will be checked for geotechnical compatibility using standard grain-size analysis. The sulfur and composted manure will be obtained locally.

The sulfur and composted-manure amendments will not be reapplied during the course of the study. Sampling will provide the data to evaluate how long the ability to adequately suppress selenium uptake persists. At the end of the pilot study, if it is determined that reapplication of amendments is necessary, based on the Risk Assessment findings, Simplot will work with the Agencies define the rate and frequency of reapplication.

4.2.2 Plant Species Mix

The seed mix proposed for use in this FSPS includes grasses; many of which have been identified in the surrounding native (i.e., undisturbed) areas. The same certified-stock seed mix will be used for all plots and consists of the following 9 species:

- Mountain brome (*Bromus marginatus*);
- Smooth brome (*Bromus inermis*);
- Slender wheatgrass (*Elymus trachycaulus*);
- Western wheatgrass (*Pascopyrum smithii*);
- Pubescent wheatgrass (*Agropyron intermedium*);
- Big bluegrass (*Poa secunda*);
- Sheep fescue (*Festuca ovina*);
- Orchard grass (*Dactylis glomerata*); and
- Tufted hairgrass (*Deschampsia cespitosa*).

A certified seed vendor will be identified, and the species and poundage of pure live seed to be purchased will be based on rates identified on Table 4-2.

4.3 Construction Implementation

This section describes the design and general implementation of the FSPS construction. Simplot will provide the labor, materials and equipment required to construct the FSPS. Attachment 1 includes the general drawings (G40, G41, and G42) and the for construction drawings (C40 through C50 and REF1, REF2, REF3, and RED4).

4.3.1 Preparatory Activities

Preparation activities will include creating a road around the perimeter of the pile (Attachment 1 Drawing C40), with placement of silt fences and bay bales, to allow for clearing and grubbing, installation of the sedimentation basin and other storm-water and erosion controls. The perimeter road and storm-water controls will be constructed before any regrading of the pile. Preparation activities in the borrow areas will include clearing and grubbing, installation of storm-water controls, and refurbishing of the existing cut-off road on the west side of the northern borrow area (Drawing C46). This work will commence in 2012.

4.3.1.1 Access

Access to the FSPS area will be from a refurbished former haul road west of the site. As a result of grading the pile to a 3:1 slope (Attachment 1 Drawings C40, C40.1 and C41), lower portions of the existing haul road will be covered. To regain access to the bottom of the pile, the lower section of the road will be constructed along the new western edge of the pile (Attachment 1 Drawing C40). Sections of the existing road not being covered by the grading activities will be reclaimed.

The new access road along the western edge of the pile and the perimeter road along the north, east, and south perimeter of the pile, will be approximately 20-feet wide. These roads will be constructed to provide access and allow for the placement of silt fences and construction of storm-water controls. Sections of the roads not traversing the Rex Chert, will receive a 4-inch layer comprised of Rex Chert gravel. Runoff control ditches will be installed along the road edge (Attachment 1 Drawings C40, C40.1, and C41-C44.1). Energy dissipation basins and drainage-relief rip-rapped outfalls in bends of the roads (Attachment 1 Drawings C40 and C40.1) will be installed to manage runoff flow velocities. The drainage-relief rip-rapped outfalls will disperse excess flow onto stable well-vegetated areas.

4.3.1.2 Clearing Grubbing

An area of approximately 21 acres will be cleared to accommodate the grading activities, installation of the perimeter road, and installation of storm-water controls. Some of the tree materials removed from the native area west (upslope) of the pile (Figure 4-1) will be saved for later use in the reclamation process. Topsoil from the native areas will be stripped and stockpiled for potential reclamation use (if total selenium concentrations are below 13 mg/kg). In addition, approximately 10 acres atop the pile will be cleared of vegetation. Clearing and grubbing will be performed following installation of silt fencing.

4.3.1.3 Borrow Area Development

Prior to beginning the borrow-area development, the property-ownership boundaries will be surveyed and marked. In preparation for development, prior to clearing and grubbing the area, silt fences and storm-water controls will be installed. The borrow area excavation boundaries will not extend to edges of the property ownership.

A portion of the upper 6 inches of topsoil will be stripped and stockpiled for later use in reclamation of the borrow areas. Straw bales or silt fences will be placed around these stockpiles. The rest of the topsoil, weathered Dinwoody clayey soils, which underlie the colluvium, will be excavated down to a gravel-cobble zone in the borrow areas, and will then be transported to the FSPS area for use as cover material for the plots. The borrow stock piles will be placed along the upper haul road (Attachment 1 Drawing G41) with silt fencing and hay bales placed around the perimeter of the piles.

4.3.1.4 Storm-water Control Structures

The storm-water controls are based on estimated peak flows from a 10-year 24-hour storm event, with a minimum of a 1-foot freeboard. The storm-water controls will be constructed following installation of silt fencing on the down-slope area of the perimeter road and below the sedimentation pond construction area.

Run-on Controls - The primary run-on controls for the overburden pile is a hillside run-on control ditch located west of the pile (Attachment 1 Drawing C40). The run-on control ditch will drain towards the north, discharging into an energy dissipation basin and into the northern runoff control ditch. The ditch will typically have side slopes on the hill side of 1.5:1 and side slopes adjacent to the regraded upslope area of 2:1. The minimum depth will be 1.5 feet and peak velocities will range from approximately 5 to 8 feet per second (fps). The run-on control ditches will be broadcast seeded with the approved seed mix following construction and will be protected from erosion using turf reinforcement material (TRM). Therefore the run-on control ditches will ultimately be vegetated. The run-on control ditch profiles and typical sections are presented on Drawing C42, C43 and C44.

Runoff Controls - The runoff controls will consist of ditches along the northern, eastern and southern toe areas of the pile. The runoff control ditches will be V-ditches with 2:1 side slopes and a minimum ditch depth of 2 feet, with estimated peak water velocities varying from approximately 5 to 8 fps. These ditches will typically be vegetated, and if the ditch gradient exceeds 11 percent a TRM will be used to control erosion. The estimated maximum velocity in runoff ditches will be in the range of velocities (9 to 10 fps) for which TRM can provide adequate protection.

The north and east runoff ditches discharge through 24-inch culverts into the sedimentation basin. Heavy riprap, over heavy non-woven geotextile, will be placed at the culvert discharges on the sedimentation basin interior slope (Attachment 1 Drawing C45).

Dissipation Basins - Dissipation basins are designed to reduce high-velocity energy from peak flows from a 100-year storm event. The dissipaters will consist of large, 12 to 24-inch angular rock with a median, D_{50}, size of 15 to 18 inches. The large rock will be placed on a heavy non-woven geotextile beneath. The dissipation basins will be 10-feet long and 3-feet deep with 2:1 side slopes (Attachment 1 Drawing C44).

Sedimentation Basin - A sedimentation basin with a maximum depth of approximately 6 feet will be constructed east of the toe. This basin is designed to retain the runoff volume from the regraded area for a 10-year, 24-hour storm event. A portion of the excavated material will be used for compacted fill in an embankment along the north and east sides of the sedimentation basin (Attachment 1 Drawing C45). This embankment will be compacted to at least 90 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698). Excess excavated material will be added to grading fill or cover soil at the regraded pile.

An emergency spillway is designed at the sedimentation basin to discharge peak flows from a 100-year storm event on the FSPS area. This spillway will consist of a ½-round 48-inch diameter corrugated metal pipe (CMP). Heavy riprap (12 to 24-inch angular rock) will be placed at the discharge of the ½-round CMP.

4.3.2 Construction Method Specification Development

Simplot will perform a Test-Fill study (Appendix D) to obtain the necessary information to develop a method specification. The method specification will guide the fill placement and compaction during the grading activities.

4.3.2.1 Test Fill Setting

The proposed setting for the test pads is in an area west of the FSPS, along the Woodall Mountain saddle (Figure 4-4). The overburden material to be used in the test pads will be obtained from overburden material in saddle area extracted from the same mine panel (Figure 4-5) as the materials at the FSPS pile.

4.3.2.2 Test Fill Data Collection

The test-fill pads will include:

1. Test Pad 1 - Scraper placement and bulldozer spreading (if necessary) in relatively uniform lifts of approximately 24 inches. Compaction through equipment travel by having operators split the tracks of the previous scraper placement.

2. Test Pad 2 - Scraper placement and bulldozer spreading (if necessary) in relatively uniform lifts of approximately 36 inches. Compaction through equipment travel by having operators split the tracks of the previous scraper placement.

3. Test Pad 3 - Bulldozer placement in relatively uniform 24” lifts.

4. Test Pad 4 - Bulldozer placement in relatively uniform 36” lifts.

5. Test Pad 5 – Bulldozer placement in relatively uniform 24” lifts with compaction by sheepsfoot compactors.

6. Test Pad 6 – Bulldozer placement in relatively uniform 36” lifts with compaction by sheepsfoot compactors.
7.
8. Test Pad 7 – “Push Dozing” to fill a 20-foot deep void. This method of fill placement is intended to mimic the scenario where deep voids need to be filled through dozing to create safe operating slopes. Overburden material will be dozed into a void, receiving no compaction other than from dozer travel when the 20-foot fill gets spread and leveled (Appendix D).

It is anticipated that the overall thickness of test pads 1 through 6 will be 12 feet, with the dozer pad thickness at approximately 20 feet (Appendix D).

Geotechnical Tests - Three composite samples of overburden material to be used in the test pads and three composite samples from the FSPS pile would be collected for geotechnical analysis (Appendix D). Each composite sample would be comprised of 3 subsamples[3] taken from test pits and homogenized through manual mixing. These samples will be tested in the laboratory for grain-size analyses (ASTM D422), Atterberg Limits (ASTM D4318), and Standard Proctor Compaction (ASTM D698).

Settlement Measurements - Settlement measurement of the placed material will be performed primarily through surveyed elevation measurements of each lift. The initial survey measurements will be on an 8-ft by 10-ft square grid system[4], within a 30 feet by 45 feet area of the first lift (Appendix D). The surface elevation of each subsequent lift will be surveyed on the same grid system, so that data may be obtained from the same locations as the test fill rises.

[3] Test pits will be advanced to 3 feet below ground surface (bgs) and each subsample will be collected by scraping the full length of the pit walls.
[4] The grid width is based on the tire-center-lines and the track-gauge widths of the scraper and dozer, respectively.

Survey elevations will be obtained following placement just prior to compaction and following compaction at each location to verify lift thickness and determine the compression of each lift.

Two settlement plates per test pad will be utilized to measure the amount of longer-term settlement beneath the fill due to the added weight of the test fill. Each settlement plate will be surveyed initially for elevation following placement and periodically checked during the test fill program (Appendix D).

Field Compaction Test - Nuclear gage density testing will be performed following placement of each lift to correlate density data with survey measurement and GPS data. Two nuclear gage tests will be performed for each lift during the construction of the pads, at pre-determined random grid patterns (Appendix D). The densities and moisture contents measured with the nuclear gage will be compared against the appropriate Proctor curve to determine the measured density as a percentage of the maximum dry density for the compactive effort.

4.3.2.3 Test Fill QA/QC

Quality Control (QC) for the test-fill study will include the compaction and grain-size analyses tests performed prior to the start of the program (Appendix D). Additional QC will include survey control for the subgrade preparation and test pads as well as regular surveying for grade control and lift heights and compression measurements. It is anticipated that at least one QC field nuclear density test will be performed in each test section for each lift with additional tests performed if deemed necessary by project engineers.

Quality assurance (QA) for the test-fill study will include full-time direction by a qualified Formation Environmental geologist or engineer, supervised by a Formation Environmental Idaho-Registered Professional Engineer (PE). Construction of the test pads will be documented using GPS-guided equipment data, field forms (Appendix D), photo documentation, and daily reporting of activities. Additional QA to verify the QC will include laboratory testing, survey measurements, and field nuclear density tests at a rate of 5 percent. All data produced will be reviewed by the PE.

4.3.2.4 Test Fill Reporting

Following the implementation of the test fill, Simplot will submit a report summarizing the analysis and interpretation of the information and propose a method specification for fill placement during the construction of the FSPS. Both the compaction density data and settlement data will be reviewed to determine the appropriate method specification for placement and compaction, as well as QA/QC testing. It is anticipated that the report will be completed within 3 weeks after completion of the test-fill study for submittal to the Agencies.

4.3.3 Major Grading

Major grading of the existing pile will be performed using appropriate equipment to achieve side slopes of 3:1, as shown on Drawing C40. Typical cross sections are shown on Drawing C41. The grading plan includes an approximate balanced cut and fill, with fill placed along the cleared west side of the pile. The total volume of cut and fill required for grading is approximately 180,000 cy. Compaction of fill material, placed primarily along the west side of the graded area, will be performed according to the Agency-Approved Method Specification developed following the above-mentioned Test-Fill Study.

4.3.3.1 Fill Area Soil Cover

A Dinwoody Formation soil cover will be placed on the regraded area west and northwest of the test plots, to reduce the potential for releases and exposure to selenium and other Chemicals of Potential Concern (COPCs).[5] The soil cover will be a minimum of 18 inches thick (Drawing C41). The soil cover will be compacted to no less than 80 percent and greater than 85 percent of Standard Proctor (ASTM D698).[6] The Dinwoody Formation material to be used for the construction of the soil cover will be tested in the laboratory for grain-size analyses (ASTM D422), Atterberg Limits (ASTM D4318), and Standard Proctor Compaction (ASTM D698). To reduce erosion, the cover will be revegetated with the same plant species mix approved for the study, and the seed application will occur in the same manner as described in Section 4.3.3.2. In addition, wattles and hay bales will be installed to further minimize erosion.

Cover placement CQC and CQA will be performed in accordance with Section 4.3.4 to provide assurance that the cover is constructed in accordance with the plans in Attachment 1 and compacted to the above-mentioned percent of Standard Proctor.

4.3.3.2 Plot Material Placement and Seeding

Plot material will be placed using GPS-guided equipment or guided by slope stakes. The thickness will be checked periodically to verify that the required soil thicknesses are achieved.

Seeding will occur with hydromulch (wood fiber in a water slurry) application in the fall of 2012. The hydromulch seeding will be performed in two steps. The first step will consist of a seeded mixture of water and minimal mulch. The second step will include the full application of mulch with tackifier. This will maximize good seed contact with soil and minimize the amount of seeds remaining in the mulch suspension. The first application of hydromulch seed mix will be

[5] The intended function of the soil cover is to provide a physical barrier to reduce water infiltration into overburden materials (i.e., reduce exposure to weathering conditions resulting in releases of selenium and other chemicals of potential concern [COPCs]), and reduce plant uptake of selenium (i.e., provide a root zone that reduces the potential for root contact with overburden materials).
[6] Research conducted by Goldsmith, Silva, and Fischenich (2001) suggests that a compaction between 80% and 85% of the standard Proctor maximum dry density provides many of the stabilizing benefits of higher soil compaction without jeopardizing the viability of vegetation development and growth.

uniformly broadcasted on the soil surface at a rate of 46 pounds per acre (lbs/acre). The second application will be at a rate of 1,800 pounds per acre.

Inorganic fertilizer will be applied to supplement the nutrients present in each plot, if necessary. The substrate (i.e., overburden, amended overburden, cover soil), hereafter referred to as cover soil, will be tested to determine their intrinsic nutrient content (in units of mg/kg), as described in Section 5.1.1. The application rate for inorganic fertilizer to each plot will then be calculated based on review of the cover soil tests, fertilizer guidelines, and recommendations from agricultural experts.

4.3.4 Construction Quality Assurance and Control

Test plot construction quality assurance (CQA) and construction quality control (CQC) will be performed to provide assurance that the construction is performed in accordance with the plans and specifications in Attachment 1. The CQA/CQC activities include:

- Periodic construction inspection (e.g., verification of design elevations and grades);
- Sampling and testing of overburden material and cover soils (e.g., random sampling for moisture content and in-place density);
- Review of material submittals (e.g., seed mix, elemental sulfur pellets, hydromulch, etc.); and
- Documentation of field changes and maintenance of a materials quantity log (i.e., quantities of materials installed), and construction reporting and communications.

Figure 4-4 summarizes the key individuals involved in the construction of the FSPS.

4.3.4.1 Construction Quality Control

The CQC will be an ongoing process of controlling and measuring material and earthwork characteristics to provide verification that the work is performed in accordance with the approved plans, specifications, and approved field changes. The CQC will be performed by a qualified member of Simplot's construction team (Figure 4-7) and recorded in daily logs or on field forms.

Material Quality Control - Material quality control will consist of inspecting materials (e.g., piping, TRM, etc.) and equipment (e.g., nuclear instrument, etc.) to ensure that they meet requirements.

Earthwork Quality Control - Earthwork quality control will consist of grain size analyses (GSAs) of the Dinwoody Formation and Rex Chert borrow material, and overburden materials. In addition, testing of the soil cover, fill area, and sedimentation basin embankment will include moisture content and field compaction testing. Samples will be collected for GSA for each plot where soil layers are placed atop the overburden material. If material layers are not geotechnically compatible to provide adequate capillary barriers, the materials will be re-worked or re-blended as necessary. Samples will also be collected for GSA from native soils to be used as compacted fill in the sedimentation basin embankment.

Nuclear instrument testing of the soil cover, fill area, and sedimentation basin embankment will be performed in accordance with ASTM D2922 to confirm in-place compacted density and moisture of fill materials as compared with ASTM D698 (Standard Proctor Compaction Curve). The frequency of compaction testing for compacted fill in the sedimentation basin embankment will be one test per 500 cy, or one test per lift whichever is more frequent. Any area of embankment fill that fails to meet the compaction acceptance criteria will be reworked until a subsequent test shows acceptable results. Such re-working may require adding water to the materials if they are more than 3 percent dry of the optimum moisture content or scarifying and air drying the materials if they are more than 3 percent wet of the optimum moisture content. The embankment areas of failed compaction tests will then be re-compacted and retested as necessary until the test indicates compliance with specifications.

The frequency of compaction testing for the soil cover will be one test per 5,000 cy, as detailed in Attachment 1. Any area of the cover that fails to meet the compaction acceptance criteria will be reworked until a subsequent test shows acceptable results.

Quality control evaluation of grading fills west of the pile will be according to the Method Specification developed following the above-mentioned Test-Fill Study.

QC of geometric limits (e.g., grade and contour) for the plots and covers will be through use of wooden grade stakes and GPS-guided equipment. The placement of stakes will be by a qualified surveyor using standard surveying techniques. Daily survey will be required during construction to verify that design lines and grades are achieved within acceptable tolerances.

Amendment Material Quality Control - The composted manure will be evaluated to assure that it does not provide a vehicle for the introduction of weeds. Although there is no official certification process for composted manure to be considered certified weed-free, the Idaho State Department of Agriculture (ISDA) has developed a process, in conjunction with the Idaho Department of Transportation (IDOT), to determine the weediness of potential compost sources. This widely accepted test consists of “growing out” samples of compost at the State seed lab to see if they are weed-free, as described in Appendix B.

Survey Quality Control - Survey control will be established prior to construction using the existing system and topography. Surveying will be performed to General-Order surveying accuracy, by a surveyor registered in Idaho or by a qualified surveyor under the supervision of an Idaho-registered surveyor. A final survey will be performed at the end of construction to verify as-constructed conditions. A final survey will be performed at both the regraded overburden pile and borrow areas to document as-constructed conditions. The final as-built survey will be stamped by an Idaho-registered surveyor.

Seeding Quality Control – Seed mix and fertilizer-formulation documentation will be reviewed to ensure that the seed-mix requirements are met. Each seed-mix lot will be tested for purity, germination and noxious weed content. The seed mix will be stored according to vendor recommendations.

4.3.4.2 Construction Quality Assurance

Independent CQA inspection and testing will be performed by Formation Environmental to verify the adequacy and effectiveness of the CQC program. The CQA will include construction inspection and management as necessary, periodic confirmation sampling and testing of earthwork and materials (e.g., composted manure and elemental sulfur), review of material submittals, construction reporting and communications, and documentation of all CQA activities. Should CQA and CQC test results vary significantly, additional testing may be requested by the lead engineer to validate the results.

Construction Inspection and Management - Construction inspection will include observation of construction at the overburden pile and borrow areas. Minor questions from the constructors will be answered by Formation's onsite CQA manager. The lead engineer will be contacted as necessary for clarification of design intent or possible design change needs. It is anticipated that the lead engineer will visit the site periodically during construction. Necessary design changes identified by the lead engineer during construction will be documented and submitted to the Agencies for review.

The CQA manager will coordinate all third-party site surveying needs and will coordinate CQA testing. A qualified individual will periodically sample earthwork materials, perform CQA tests for GSA and field compaction, and verify cover thicknesses[7]. It is estimated that the CQA tests for earthwork GSA, soil cover compaction, and embankment-fill compaction will be performed at a rate of approximately 10 percent of the quality control tests. Quality assurance surveying may be performed, as necessary, to verify the accuracy of the surveying.

Review of Material Submittals and QC Data – Simplot will obtain material submittals for materials (e.g., pipe, silt fence, seed, mulch, geotextiles, etc.) used to construct the FSPS.

[7] Cover thicknesses will be verified through manual measurements and evaluating GPS data from construction equipment.

Such submittal information will be reviewed by the lead engineer for compliance with specifications. If alternative materials, other than the specified material, do not meet the specifications, a revised submittal will be obtained to provide conformance with specifications.

Construction Reporting and Communications - Monthly site or teleconference meetings will be held between Simplot, the lead engineer, and regulatory oversight personnel as needed.

The daily construction records (e.g., forms recording site progress including cut and fill quantities, visitors, meetings, weather conditions, problems and resolutions, and descriptions of testing performed) will be reviewed by the lead engineer. The reports will be distributed to Simplot and the agencies as necessary.

A construction summary report (CSR) verifying and certifying the construction will be prepared at the end of the pilot study construction. This report will describe all field activities performed and will describe all field and design changes, construction issues and resolution of problems. As-constructed drawings will be prepared and field and laboratory testing data will be included in the report. Daily field inspection reports and other documentation will be included as appendices to the CSR.

4.4 FSPS Area Operation and Maintenance

Following construction, the FSPS area will be maintained and monitored for five growing seasons, with annual testing of vegetation tissue for selenium uptake and monitoring of vegetation community (as described in Section 5). Access to the project area is controlled consistent with the operations at Conda. Simplot personnel will periodically check the FSPS area to assure that it has not been altered by trespassers, wildlife, or adverse weather.

Areas of erosion within the FSPS will be restored with approved soil and reseeded. The establishment of forbs, non-native, noxious species within the FSPS area will also be monitored.[8] If necessary, herbicide will be used carefully on a spot-control basis for eradication of undesirable species. It is anticipated that the currently approved broadleaf herbicide mixture used at Simplot's mines would be used to do spot-control.[9] The actual mixture, amount and location of herbicide used will be recorded. Debris and excess sedimentation will be removed from run-on and runoff control structures using a small tracked excavator and repairs will also be performed, if necessary. Debris and excess sedimentation will be loaded into an articulating truck and moved to a contained-area (e.g., an open pit) where it would be shaped, capped and seeded. Simplot will collaborate with the Agencies to identify the best suitable place to contain the debris and excess sedimentation and will notify the Agencies when the work is about to take place.

[8] The Idaho Noxious Weed Law (Title 22, Chapter 24, Idaho Code) requires that landowners must eradicate noxious weeds on their land.
[9] Current herbicide mixture: Telar at a rate of 1.5 ounces/acre and 2,4 D at a rate of 2 quarts/acre.

5.0 SAMPLING AND ANALYSIS

Monitoring and sampling will occur both during the first-year implementation (pre-seeding; Year 0) and during subsequent growing seasons (post-seeding; Years 1 through 5). The specific data collection requirements for the FSPS are:

- Year 0:
    - Chemical characterization of the overburden material after grading and prior to addition of cover materials or other amendments;
    - Selenium and sulfur characterization of the cover soil, composted manure and the elemental sulfur pellets prior to mixing into overburden;
    - Chemical and nutrient characterization of the soil in each of the plots after addition of cover materials, amendments and fertilizer.
- Years 1 through 5:
    - Selenium concentrations in dominant grasses and dominant forbs species that may potentially get reestablished;
    - Selenium concentrations in discrete hyper-accumulator plant species samples, if present:
    - Plant cover and plant community composition data;
    - Rooting depth data;
    - Selenium concentrations and agronomic parameters in soil.

Table 5-1 presents a summary of the proposed sampling for each of the test plots. The Conda Standard Operating Procedures (SOPs) that will be utilized are SOP No. 05 (Sample Custody, Packaging, and Shipment), SOP No. 09 (Soil Sampling), SOP No. 13 (Field Equipment Decontamination), SOP No. 16 (Field Documentation), SOP No. 18 (Vegetation and Soil Sampling), SOP No. 20 (Vegetation Community Sampling), SOP No. 21 (Soil Profile Root Observations), SOP No. 22 (Weed Germination Test), and SOP No. 23 (Material Stockpile Sampling). All these SOPs are included as Appendix B.

5.1 Year 0 Sampling and Analysis

During the set-up of the test plots, overburden and soil sampling, analysis, and documentation will be performed as identified below.

5.1.1 Sampling

As previously mentioned, Year 0 sampling includes the sampling of overburden material prior to the addition of any cover soil or amendment, and sampling following the addition of cover soils and amendments.

Dinwoody Formation Soil Cover Material Sampling Prior to Excavation – Ten composite samples of the weathered Dinwoody Formation material will be collected from the borrow area. Each composite sample will be comprised of 5 randomly located sub-samples. The subsamples will be collected from the weathered profile of the Dinwoody Formation within the side walls of test pits excavated with a backhoe (or similar equipment). The subsamples of approximately equivalent mass for each sample will be combined together in a stainless steel bowl or Ziploc bag and then mixed thoroughly before the composite is transferred into a sealable container and submitted to the laboratory for analysis. The composite can be mixed using a stainless steel spoon or manually with gloved hands.

Dinwoody Formation soil with selenium concentrations greater than 13 mg/kg will not be used as cover material without consulting with the Agencies.

Overburden Sampling Prior to the Addition of Soil Cover and Amendment – One composite sample of the overburden material, comprised of 30 random increments, will be collected from each plot. The subsamples for each composite will be collected from 0 to 12 inches. The compositing methods will be performed in the same fashion as described above. Table 5-1 presents a summary of the proposed sampling for each of the test plots.

Sampling of the Composted Manure and the Gypsum – One composite sample, comprised of 30 increments, will be collected from each truckload of composted manure and elemental sulfur as the materials are being dumped from the trucks into stockpiles. The compositing methods will be performed in the same fashion as described above.

Soil Cover System Sampling – An additional 30-increment composite sample will be collected from each the completed plots (i.e., with covers and amendments in place). The compositing methods will be performed in the same fashion as described above.

5.1.2 Sample Analysis

Overburden Samples Collected Prior to the Addition of Soil Cover and Amendment – Overburden samples will be analyzed for total selenium. Total selenium will be analyzed by method 3114C (Table 5-2).

Composted manure and Elemental Sulfur Samples – Composted manure samples will be analyzed for moisture content, nutrients, soluble salts, pH, total organic carbon, carbon-nitrogen ratio, total metals, total selenium, sulfur, fecal coliform, germination, respiration, and ammonia (Table 5-2). Elemental sulfur samples will be analyzed for total selenium and sulfur (Table 5-2).

Soil Cover System Samples – Soil cover system samples will be analyzed for total selenium and basic agronomic soil parameters. The nutrient results from the soil samples will be used to prescribe an appropriate fertilizer rate for all of the treatment plots. Fertilizer will then be added to the plots at the same time as seeding.

5.2 Years 1 through 5 Sampling and Analysis

Vegetation communities on the plots will be monitored and sampled annually in mid-summer (e.g., July or early August), during Years 1 through 5. Monitoring activities will include annual observational surveys to evaluate and document general conditions (mainly to identify any erosion or reestablishment of unwanted plant species) and quantitative vegetation community measurements. Sampling will include annual collection of dominant grass and forb species, with co-located soil samples.

Root growth will be documented in year 5 of the study in each of the treatment plots to evaluate the root distribution in the cover-systems profiles at the completion of the study.[10] The presence/absence of roots will be photo documented in randomly located 5-foot long trenches excavated through the cover-soil profile and 12-inches into the overburden material, as described in SOP No. 21. Root presence/absence will be assessed at three assessment points within the trench. Each assessment point will be 1 foot wide and extend from the surface to the bottom of the trench. If the Agencies decide that sampling to determine root growth is required prior to Year 5 of the study, root growth sampling on selected test plots will be conducted prior to Year 5. The protocols for the interim root growth sampling will be determined in consultation with the Agencies.

Table 5-1 presents a summary of the proposed sampling for each of the test plots.

In addition, in year 1 only, the area of deepest fill placement will be surveyed to evaluate settlement.

[10] Root growth will be evaluated in the last year of the study, since root growth would be greatest in year 5. In addition, disturbances to the plots as a result of using equipment to excavate trenches will not influence the study.

5.2.1 Monitoring Activities

The following subsections describe the monitoring activities.

5.2.1.1 General Condition Survey

Observational surveys will be conducted within the FSPS area by knowledgeable field personnel to document and evaluate general conditions at each plot. Surveys will involve looking for the reestablishment of unwanted plant species (e.g., selenium accumulators and noxious weeds), and evidence of failed vegetation

The general conditions will be documented with photographs taken at dedicated photo documentation points. Photos taken from these points can be used to qualitatively follow development of the vegetation community over time. The dedicated photo points will be recorded using a portable Global Positioning System (GPS) unit and marked on a map. The annual photos will be labeled and archived. Additional photographs may also be taken at other times of the year to document seasonal changes within the FSPS area.

5.2.1.2 Quantitative Vegetation Monitoring

Quantitative measurements of plant cover, community structure, and community diversity will be collected on an annual basis. Plant growth is prone to large annual variations, and monitoring vegetation growth for a period of five growing seasons will allow for the evaluation of temporal trends.

For measuring vegetation community and for collecting soil and vegetation samples, a regularly-spaced grid yielding 36 intersection points will be established within each plot for each of the annual sampling events (Year 1 through Year 5). Due to the size of the plots, the points will be approximately 10-15 feet from each other. Refer to Figure 5-1 for an example schematic. The starting point for each grid will be randomly determined and the grids shifted by 3 feet each year so as to sample different points each year.

Vegetation measurements of plant cover and community composition will be collected at each of the 36 points during mid-summer using an adaptation of the Step Point Method, as outlined by USFS and BLM (1999). The Step Point Method involves making observations at points, using a pin to record cover “hits” at different heights above the ground. It measures cover for individual species, total cover, and species composition by cover (USFS and BLM 1999). Specific implementation of this methodology is presented in Conda SOP No. 18 (Vegetation Community Sampling) (Appendix B), and a general description is provided here.

For each of the annual sampling events (Year 1 through Year 5), tape measures will be used to locate each of the 36 points. At each observation point, a ¼-inch diameter aluminum pin with marks at 1 inch, 12-, 24- and 36-inches from the end will be lowered vertically until the end hits the ground. The ground level feature hit with the point of the pin as well as any vegetation intercepted by the pin at other levels will be recorded on the field data sheet by dot count tally. An example of the field data sheet for recording this information is included in Appendix B. The ground-level hits will be recorded in the Ground-Level Cover section of the form, except where there are both ground-level and other level (i.e., basal or canopy cover hit) combinations. Ground-level/other level combinations will be recorded in the Basal and Canopy/Foliar Cover section of the form. A dot count tally will be recorded for each ground-level/other level combination when it is first entered on the form and then again each time this same combination is encountered at the observation points along the transect.

Ground-level hits (excluding basal vegetation hits) will fall into four cover categories. They can be redefined and/or additional categories added, depending on the site conditions. The four categories are litter (L), bare ground (B), gravel (G; particle sizes between 1/12 inch and 10 inches), and stone (S; greater than 10 inches). Basal hits on live vegetation are counted when the plant crown is at or below a 1-inch height above the ground. Level 1 hits on live vegetation are counted when vegetation is encountered between 1 and 12 inches above the ground. Level 2 hits on live vegetation are counted when vegetation is encountered between 13 and 24 inches above the ground. Level 3 hits on live vegetation are counted when vegetation is encountered between 25 and 36 inches above the ground. If vegetation is encountered above 36 inches above the ground, that can be noted accordingly on the field data sheet.

To supplement the observation point data, species that are opportunistically observed in the plots, but not encountered at the observation points, will also be recorded on the field data sheets.

The recorded measurements will be used to calculate ground cover, vegetation cover, percent cover by cover category, percent cover by species, and percent cover by vegetation level (i.e., height). Additional observations will be used to ascertain overall species diversity and presence/absence of noxious weeds.

5.2.2 Vegetation and Soil Sampling and Analysis

For each of the annual sampling events vegetation and soil samples will be collected from the plots as described in the following subsections. Vegetation and soil samples will be collected from the same 36 points established for quantitative vegetation monitoring.

5.2.2.1 Vegetation Tissue Sampling

One composite sample of the dominant grass species and one composite sample of the dominant forb species will be collected from each plot. Prior to clipping vegetation, the vegetation species will be identified and documented. Details on the composite sampling methodology are presented in Conda SOP No. 20 (Vegetation Community Sampling) (Appendix B), and a general description is provided here.

Subsamples of dominant grass and dominant forbs will be collected from as close to each of the 36 subsample locations as possible. Ideally, two separate subsamples of vegetation (i.e., grass and forbs) will be collected from each of the 36 subsampling locations, but the actual number of subsamples will depend on the distribution/availability of the vegetation. The subsamples will be composited into one sample for selenium analysis. Discrete hyper-accumulator plant species samples will be collected from each plot, if present. A field sampling form will be completed for each sample detailing the contents of the sample. Above-ground vegetation will be cut to approximately one inch above the ground and the collected vegetation will be composited into a single labeled Ziploc bag.

5.2.2.2 Soil Sampling

One composite soil sample will be collected from each plot during annual soil sampling events. Details on the composite sampling methodology are presented in SOP No. 09 (Soil Sampling) (Appendix B), and a general description is provided here.

Subsamples of soil will be collected from each of the 36 subsample locations. The subsamples for each composite will be collected from 0 to 12 inches. The subsamples will be combined together in a stainless steel bowl and then mixed thoroughly before the composite is transferred into a sealable container and submitted to the laboratory for analysis. The composite can be mixed using a stainless steel spoon or manually with gloved hands.

In addition, to evaluate selenium transport from the overburden into the soil cover systems, annual soil-profile samples will be collected from the cover systems. Annual soil-profile sampling will occur on one replicate plot for each of the cover systems, alternating between replicate plots for the duration of the study. Soil profile sub-samples will be collected at depths of 0-1, 4-5, and 8-9 inches within the 12-inch covers, at depths of 0-1, 4-5, 8-9, 12-13, and 15-16 inches within the 18-inch covers, and at depths of 0-1, 4-5, 8-9, 12-13, 15-16, 16-18, and 19-21 inches within the 24-inch covers. The at-depth samples shall be collected from a minimum of three locations (three subsamples for each depth interval), and the subsamples composited into a single sample at each depth interval for each cover system. The composite samples for each depth interval will be analyzed for total selenium.

5.2.3 Sample Analysis

Samples will be analyzed using USEPA-approved methods with detection limits below the 5 mg/kg removal action level.

Vegetation Sample Analysis - All vegetation samples will be submitted to the laboratory as unwashed samples, but they will be washed of adhering particles by the laboratory prior to preparation for analysis. The plant samples will be weighed, rinsed three times with deionized water, and then dried for at least 24 hours at 60+ degrees Celsius (ºC) and re-weighed to determine percent moisture. The dried vegetation samples are then ready for chemical analysis. The dried samples will be finely ground (pass a 10-mesh screen) in a Wiley mill and the samples will be analyzed for total selenium.

Soil Sample Analysis - Soil samples will be analyzed for total selenium, sulfur and basic agronomic parameters (Table 5-2).

5.3 Quality Assurance Samples

QA replicate samples will be taken for ten percent of all vegetation and soil samples (i.e., one for every ten field samples) collected in order to evaluate field sampling error (Table 5-1). Replicate samples will be made by splitting the samples in the field to obtain a duplicate. Each duplicate soil sample will be comprised of 36 increments. The duplicate soil samples will be collected from different plots each year.

Equipment rinsate samples will be collected at a rate of one for every 20 samples.

5.4 Documentation

Simplot will document all details that would be necessary to recreate the test plot construction and sampling activities.

Adequate photos will be collected during the FSPS construction to document the preparation activities (e.g., clearing and grubbing and grading), addition of amendments, placement of cover soils, and seed mix application. Annual photographs will be taken at dedicated photo documentation points. Plot corners, transects, and prior sampling locations will be recorded using portable GPS units. Field forms included in the referenced SOPs will be completed to support general note taking in logbooks.

6.0 DATA ANALYSIS AND REPORTING

6.1 Data Review

Laboratory data for sample analyses will be reviewed before results are reported. The review will confirm that all requested analyses were performed using the procedures specified in this plan. The review will also include evaluation of data quality using results from the laboratory's data quality analyses, including analytical duplicates, matrix spike samples, and control samples or standards. Any deviations from this plan or concerns regarding data quality will be resolved by working with the laboratory, which may include request for reanalysis of samples.

Field measurements will also be reviewed before those data are reported. The field notes, measurement entries, and any calculations will be subject to a peer review. Errors identified during the review will be corrected by the field staff with documentation of the correction date.

6.2 Statistical Analysis Methods

The results will be summarized statistically. The data sets will be subjected to tests of normality and homogeneity of variance prior to statistical analysis. If necessary, data will be transformed for a fit to the normal distribution before using a general linear model procedure. The mean, standard deviation and interquartile range (25th and 75th percentile values) for each parameter in each data set will be computed. Data sets for plant biomass and selenium concentration data will then be compared among treatment groups using an analysis of variance procedure, and this analysis will be followed with a Tukey's studentized range test to separate treatment means. Treatment differences will be reported at the alpha (α) = 0.05 level (i.e., 95 percent confidence level).

6.3 Reporting

Simplot will produce a FSPS Construction Completion Report, annual FSPS Evaluation Reports and a Final Report.

6.3.1 Study Implementation Completion Report

A FSPS study implementation completion report will be prepared at the end of the 2012 construction season. This report will describe all field activities performed during the construction of the FSPS and will describe all field and design changes, construction issues and resolution of problems. As-constructed drawings will be prepared and field and laboratory testing data will be included in the report. Field inspection reports and other documentation will be included as appendices to the construction completion report. The report will be provided by November 30, 2012.

6.3.2 FSPS Evaluation Report

Results for vegetation community information and selenium content of vegetation samples will be summarized annually. Photo documentation of the test plot conditions will also be included in each report. During the first year of the study, the annual report will also include results from analyses of amendments and amended overburden samples. Annual reports will be submitted by December 31 for each year that sampling occurs. The final annual report (6th year of project and 5th growing season) will be a FSPS Evaluation Report analyzing and interpreting the overall FSPS results. A Final Report that summarizes all data and presents final recommendations for reclamation will be prepared at the end of the project period by December 31 of the final year of field testing.

7.0 SCHEDULE

Contingent on agency approval, the FSPS area preparation (e.g., stormwater controls installation, clearing and grubbing, and grading) are anticipated to begin in the spring of 2012, with construction of the plots beginning in mid-July 2012 and seeding to occur towards the end of September. Table 7-1 presents a general schedule for the planning documents, construction, sampling, and summary reports.

Simplot will notify the Agencies of planned construction activities at least one week prior to commencing activities.

8.0 REFERENCES CITED

Formation Environmental. 2010. Annual Report 2008-2009. Habitat Management and Environmental Monitoring at the Smoky Canyon Mine Tailings Impoundment, July 2010.

Goldsmith, W., Silva, M., and Fischenich, C. 2001. Determining Optimum Degree of Soil Compaction for Balancing Mechanical Stability and Plant Growth Capacity, ERDC-TNEMRRP-SR-26, U.S. Army Engineer Research and Development Center, Vicksburg, Miss.

Idaho Department of Environmental Quality. 2004. Area Wide Risk Management Plan: Removal Action Goals and Objectives, and Action Levels for Addressing Releases and Impacts from Historic Phosphate Mining Operations in Southeast Idaho, February 2004, IDEQ# WST.RMIN.SEAW.6005.67068.

Mackowiak, C.L. and Amacher, M.C. 2008. Soil Sulfur Amendments Suppress Selenium Uptake by Alfalfa and Western Wheatgrass. University of Florida, North Florida Research and Education Center, Quincy, FL and US Forest Service Rocky Mountain Research Station, Logan, UT.

Mackowiak, C.L. and Amacher, M.C. 2006a. Plant Uptake of Selenium at Champ Mine: Assessment and Mitigation. e-Report for ECAP/AML Project: Phosphate Mining Remediation Feasibility Studies. Logan, UT: US Forest Service Rocky Mountain Research Station. 25 pp.

Mackowiak, C.L. and Amacher, M.C. 2006b. Plant Uptake of Selenium at Mountain Fuel Mine: Assessment and Mitigation. e-Report for ECAP/AML Project: Phosphate Mining Remediation Feasibility Studies. Logan, UT: US Forest Service Rocky Mountain Research Station. 23 pp.

Mackowiak, C.L. and Amacher, M.C. 2005. Plant Uptake of Selenium From Soils Overlying Unmined Sedimentary Rock Units and Potential Use of These Soils as Capping Materials for Revegetated Waste Rock Dumps. University of Florida, North Florida Research and Education Center, Quincy, FL and US Forest Service Rocky Mountain Research Station, Logan, UT. April.

Mackowiak, C. L., M. C. Amacher, J. O. Hall and J. R. Herring. 2004. Uptake of selenium and other contaminant elements into plants and implications for grazing animals in southeast Idaho. pp. 527-555. In: J. R. Hein (ed.) Life Cycle of the Phosphoria Formation: From Deposition to the Post-Mining Environment. Elsevier B. V. Amsterdam, The Netherlands.

NewFields. 2008a. Final Conda/Woodall Mountain Mine RI/FS Work Plan. Prepared for J.R. Simplot Company. December.

NewFields. 2008b. Final Conda/Woodall Mountain Mine RI/FS Sampling and Analysis Plan. Prepared for J.R. Simplot Company. December.

NewFields. 2007. Revised Draft Greenhouse Study Report, Plant Uptake of Selenium from Overburden at the Smoky Canyon Mine, Pole Canyon Overburden Disposal Area, Smoky Canyon Mine, Caribou County, Idaho. Prepared for J.R. Simplot Company. September.

NewFields and Redente. 2006. Final Pilot Study Work Plan – Revegetation of Tailings at the Smoky Canyon Mine. Prepared for J.R. Simplot Company. March.

NewFields and Redente. 2005. Plant Uptake of Selenium from Tailings at the Smoky Canyon Mine Tailings Impoundments, included as Appendix C-2 of Revised Operations and Abandonment Plan for the Smoky Canyon Mine Tailings Impoundments, February 2005 Draft.

Oram, Libbie, L., Daniel G. Strawn, and Gergory Moller. 2010. Chemical Speciation and Bioavailability of Selenium in the Rhizosphere of *Symphyotricum eatonii* from Reclaimed Mine Soils. December.

USEPA 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4, Office of Environmental Information, EPA/240/B-06/001. February 2006.

U.S. Forest Service (USFS) and Bureau of Land Management (BLM). 1999. *Sampling Vegetation Attributes*. Interagency Technical Reference, BLM/RS/ST-96/002+1730 (1996; revised in 1997 and 1999).

TABLES

Table 2-1
Conda Woodall Mountain Mine
Summary of Selenium and Select Other COPCs Concentrations in Soil and Vegetation in the Pilot Study Area

Location	Media	Depth of Sample (inches)		Date Range		Cadmium (mg/kg)			Chromium (mg/kg)			Copper (mg/kg)			Nickel (mg/kg)			Selenium (mg/kg)			Vanadium (mg/kg)			Zinc (mg/kg)		
		Min	Max	Min	Max	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Soil Benchmarks ->						0.36			26			28			38			0.52			7.8			46		
NT7-01	Soil	0	2	9/26/2003		12.7			256			47			113			55.8			118			447		
NT7-01	Soil	2	12	9/26/2003		12.8			259			46.8			114			37.8			116			456		
NT7-02	Soil	0	2	9/26/2003		19			668			125			225			156			224			854		
NT7-02	Soil	2	12	9/26/2003		22.7			580			113			234			80.1			216			904		
NES-6	Soil	0	4	5/20/2009		27.4			473			113			323			739			205			1330		
Vegetation Benchmarks ->						4.2			30.6			88			35.5			5			55.9			615		
NT7-01	Vegetation	NA	NA	9/26/2003	7/12/2004	0.73	4.4	2.6	0.5	3.3	1.7	4.2	17	10.2	0.83	10	6.3	10.3	214	81.3	0.41	2.5	1.2	75.1	184	115
NT7-02	Vegetation	NA	NA	9/26/2003	7/12/2004	0.53	7.5	3.2	0.48	6.2	2.9	2.6	17.6	7.28	4.7	21.9	12.4	0.33	555	112	0.34	3.6	1.8	31.7	278	120
NT7-03	Vegetation	NA	NA	9/26/2003	7/12/2004	0.34	0.34	0.34	0.48	0.48	0.48	2.7	2.7	2.7	ND (0.1)	ND (0.1)	0.1	0.15	0.65	0.35	0.49	0.49	0.49	33	33	33

Notes:

ND - Not detected. The detection limit is included in parantheses for non-detect values.

NA - Not Applicable

Averages incorporate any non-detected values using full detection limits.

Detect values exceeding the criteria levels are highlighted in gray.

Data summary includes data from both primary and field duplicate samples.

All results are based on dry weight.

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Table 3-1
Conda Woodall Mountain Mine
Dinwoody Formation Geotechnical Test Results Summary

Location	Depth (ft)	Soil Classification	Dry Unit Weight	In situ Moisture	Passing No. 200	Atterberg		Organic Content	Borrow Area Selenium
						LL	PI		
Dinwoody Formation TP-2	0-2	Lean Clayey Gravel with Sand		14.4	30			3.6	NA
	18-27	Lean Clayey Gravel with Sand		13.2	28	32	16		
	20	Lean Clayey Sand with Gravel	115.9	14.6					
Dinwoody Formation TP-3 & TP-4	0-1 & 0-2	Silt with Sand		17.9	74			7.8	
Dinwoody Formation TP-3	4	Fat Clay	94.7	26.7		58	43		
	5-11	Silt with Sand		21.6	73				
	9	Sandy Lean Clay		67.5	64	48	23		
Dinwoody Formation TP-4	2.5-5	Lean Clay with Sand		52.5	74	30	11		
	3	Lean Clay	103.6	23					
	6	Lean Clay with Sand	99.2	21.7		47	32		
Dinwoody Formation TP-5 & TP-6	0.9-2.3 & 1-4	Sandy Silt		12.8	57			3.2	1.2-4.5
	0-0.9 & 0-1	Silt with Sand		15.7	77			7.5	
Dinwoody FormationTP-5	2.3-8.3	Silty Sand with Gravel		17.9	36	27	1		
Dinwoody FormationTP-7	0-1.2 & 1.2-3.2	Sandy Silt		19.3	63			5.5	NA
Dinwoody FormationTP-5a	1-7.5	Silty Gravel with Sand			19			4.6	0.24-2.9
Dinwoody Formation TP-5b	1-3.5	Silty Gravel with Sand			27			2.7	
	3.5-5.5	Silty Gravel with Sand			24			3	
Rex	--	P.G. Gravel with Sand			1.5 - 2.4			3	1.7-5.8
Average Dinwoody Formation Material Properties at Smoky Canyon Mine	1 - 2	Silty Clay Gravel with Sand	114	17.3	62	35	14	1.8	nd*

Notes:
pcf - pounds per cubic foot
% - percent
mg/kg - milligrams per kilograms
LL - Liquid Limit
PL - Plastic Limit
ft - feet
nd - non-detect
* - Based on Dinwoody samples analyzed for E-panel at Smoky.

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Table 3-2
Conda Woodall Mountain Mine
Total Selenium Concentrations at the end of 120 Day Growth Period -
Smoky Canyon Mine Tailings Impoundment Material Greenhouse Plant Uptake Study

Treatment	Species	Mean Se (mg/kg) and Standard Errors at the end of 120 Days
Tailings treated with organic amendment and NPK	Big Bluegrass	16.3 (±2.9)
	Bluebunch Wheatgrass	19.0 (±3.5)
	Great Basin Wildrye	21.0 (±4.0)
	Idaho Fescue	23.7 (±2.4)
Tailings with six-inch soil cover placed over tailings treated with NPK	Big Bluegrass	10.7 (±2.6)
	Bluebunch Wheatgrass	9.3 (±2.0)
	Great Basin Wildrye	12.7 (±1.7)
	Idaho Fescue	10.3 (±2.3)
Tailings with six-inch soil cover placed over tailings treated with organic amendment and NPK	Big Bluegrass	13.6 (±2.5)
	Bluebunch Wheatgrass	11.4 (±2.9)
	Great Basin Wildrye	12.9 (±1.5)
	Idaho Fescue	8.2 (±1.8)
Tailings mixed with topsoil at a 50:50 ratio and placed over tailings treated with NPK	Big Bluegrass	13.3 (±1.7)
	Bluebunch Wheatgrass	10.6 (±2.1)
	Great Basin Wildrye	11.7 (±0.9)
	Idaho Fescue	12.4 (±2.1)
Tailings mixed with topsoil at a 50:50 ratio and placed over tailings treated with organic matter and NPK	Big Bluegrass	11.8 (±1.1)
	Bluebunch Wheatgrass	14.3 (±0.8)
	Great Basin Wildrye	13.6 (±0.3)
	Idaho Fescue	14.6 (±1.7)
Tailings mixed with topsoil at a 75:25 ratio and placed over tailings treated with NPK	Big Bluegrass	16.9 (±0.5)
	Bluebunch Wheatgrass	15.4 (±0.4)
	Great Basin Wildrye	17.7 (±0.9)
	Idaho Fescue	18.0 (±1.7)
Tailings mixed with topsoil at a 75:25 ratio and placed over tailings treated with organic matter and NPK	Big Bluegrass	15.1 (±1.3)
	Bluebunch Wheatgrass	16.2 (±2.0)
	Great Basin Wildrye	18.3 (±2.6)
	Idaho Fescue	14.9 (±2.3)
Soil control	Big Bluegrass	0.09 (±0.06)
	Bluebunch Wheatgrass	0.07 (±0.03)
	Great Basin Wildrye	0.13 (±0.12)
	Idaho Fescue	0.16 (±0.13)

Table 3-3
Conda Woodall Mountain Mine
Total Selenium Concentrations at the end of 60 and 120 Day Growth Periods
Pole Canyon Overburden Greenhouse Plant Uptake Study

Treatment	Species	Mean Se (mg/kg) and Standard Errors at the end of 60 Days	Mean Se (mg/kg) and Standard Errors at the end of 120 Days
Overburden Control	Slender wheatgrass	4.5±0.75	3.8±0.35
	Bluebunch wheatgrass	3.7±1.20	2.9±0.79
	Great Basin wildrye	5.2±0.47	4.1±0.30
	Mountain brome	3.9±0.85	3.7±0.50
Overburden treated with organic amendment (cow manure) at an equivalent application rate of 40 dry tons/acre	Slender wheatgrass	2.9±0.19	2.3±0.30
	Bluebunch wheatgrass	1.8±0.83	1.7±0.77
	Great Basin wildrye	3.7±0.15	2.3±0.30
	Mountain brome	2.9±0.15	1.3±0.50
Overburden treated with organic amendment (cow manure) at an equivalent application rate of 40 dry tons/acre and 40 lbs/acre nitrogen, 80 lbs/acre phosphorus and 60 lbs/acre potassium	Slender wheatgrass	2.7±0.10	2.0±0.70
	Bluebunch wheatgrass	2.1±0.09	2.1±0.55
	Great Basin wildrye	3.1±0.24	2.6±0.40
	Mountain brome	2.5±0.28	0.7±0.70
Overburden treated with organic amendment (cow manure) at an equivalent application rate of 60 dry tons/acre	Slender wheatgrass	1.9±0.52	1.9±0.65
	Bluebunch wheatgrass	1.2±0.72	0.9±0.37
	Great Basin wildrye	1.7±0.09	1.5±0.15
	Mountain brome	2.2±0.53	1.8±0.55
Overburden treated with organic amendment (cow manure) at an equivalent application rate of 60 dry tons/acre and 40 lbs/acre nitrogen, 80 lbs/acre phosphorus and 60 lbs/acre potassium	Slender wheatgrass	2.3±0.27	1.5±0.40
	Bluebunch wheatgrass	1.7±0.56	1.5±0.46
	Great Basin wildrye	2.3±0.25	2.1±0.80
	Mountain brome	2.2±0.56	0.7±0.30
Overburden treated with organic amendment (cow manure) at an equivalent application rate of 80 dry tons/acre	Slender wheatgrass	1.8±0.74	1.7±0.75
	Bluebunch wheatgrass	1.4±0.42	1.2±0.50
	Great Basin wildrye	1.9±0.37	1.6±0.60
	Mountain brome	1.8±0.10	2.0±0.30
Overburden treated with organic amendment (cow manure) at an equivalent application rate of 80 dry tons/acre and 40 lbs/acre nitrogen, 80 lbs/acre phosphorus and 60 lbs/acre potassium	Slender wheatgrass	1.3±0.05	1.1±0.50
	Bluebunch wheatgrass	1.2±0.18	1.1±0.20
	Great Basin wildrye	1.5±0.29	1.3±0.23
	Mountain brome	1.4±0.24	0.6±0.40

Table 3-4
Conda Woodall Mountain Mine
Summary of Vegetation Selenium Concentrations in Smoky Canyon Mine Tailings Impoundment Field-Scale Pilot Study Test Plots 2007 to 2009 Results

Species-specific Selenium Concentrations - Amended and Unamended Plots

Species	Selenium Concentration (mg/kg)					
	2007 average		2008 average		2009 average	
	Amended plots	Unamended plots	Amended plots	Unamended plots	Amended plots	Unamended plots
Mountain Brome	0.26	0.47	0.20	0.22	0.13	0.06
Small Burnet	0.47	1	0.24	0.26	0.27	--
Slender/Western/ Bluebunch Wheatgrass	0.30	0.65	0.15	0.16	0.16	0.05
Western Yarrow	0.49	0.76	0.25	0.37	0.26	0.32
Great Basin Wild Rye	--	--	0.15	--	0.12	--
Mixed Species	--	--	0.20	0.26	0.19	0.41
Yellow sweet clover	0.67	--	--	--	--	--
Common mallow	0.84	--	--	--	--	--
Sheep/Idaho fescue	--	--	--	--	0.46	--
Small burnet	--	--	--	--	0.27	0.21

Selenium Concentrations - Plot Averages

Test Plot	Selenium Concentration (mg/kg)				
	2007 average	2008 average		2009 average	
	Only seeded species	Only seeded species	Includes all species	Only seeded species	Includes all species
1	0.28	0.24	0.23	0.11	0.09
2	0.26	0.19	0.19	0.14	0.11
3	0.30	0.17	0.19	0.19	0.10
4	0.28	0.18	0.18	0.26	0.17
5	0.37	0.21	0.20	0.26	0.19
6	0.43	0.13	0.13	0.15	0.15
7	0.42	0.20	0.20	0.32	0.36
8	0.42	0.22	0.22	0.32	0.30
9	0.46	0.18	0.18	0.10	0.20
10	0.46	0.26	0.27	0.16	0.19
11/12	0.72	0.25	0.25	0.15	0.41

Notes:

Vegetation samples collected July 13-19, 2009

Samples were rinsed with detergent solution and deionized water, dried at 60°C, then ground and homogenized. Samples were thoroughly digested to convert all selenium to selenite before analysis. Detection limit was 0.02 mg/kg. All results presented in dry weight.

Amended plots = Plots 1 through 10; Unamended plots = Plots 11 & 12

Mixed species samples = representative mixture of seeded and non-seeded species in plot.

Common name of species = *Scientific name of species*

Western yarrow = *Achillea lanulosa*

Great Basin wildrye = *Leymus cinereus*

Small burnet = *Sanguisorba minor*

Mountain brome = *Bromus marginatus*

Slender wheatgrass = *Elymus trachycaulus*

Bluebunch wheatgrass = *Pseudoroegneria spicatum*

Western wheatgrass = *Pascopyrum smithii*

Idaho fescue = *Festuca idahoensis*

Sheep fescue = *Festuca ovina*

Key to Treatments:

1- Heavy manure; tilled 18"

2- Light manure; tilled 18"

3- Heavy manure; heavy wood; tilled 18"

4- Light manure; light wood; tilled 18"

5- Heavy manure; hay; tilled 18"

6- Hay; tilled 18"

7- Heavy manure; tilled 8"

8- Light manure; tilled 8"

9- Heavy manure; heavy wood; tilled 8"

10- Light manure; light wood; tilled 8"

11/12- no amendments

Table 4-1
Conda Woodall Mountain Mine
Test Plot Summary

Test Plot	Amendment (Ton/acre)	Weathered Dinwoody Formation (inches)	Capillary Layer (inches of Rex Chert or Wells Formation Material)	Rationale
1	na	na	na	To evaluate relative differences between selenium uptake in vegetation when growing directly on unamended overburden and when growing on gypsum-amended, manure-amended overburden.
2	2,500 pounds/acre elemental sulfur	na	na	
3	60-Tons/acre manure	12	na	
4	na	12	na	To evaluate the rate of selenium uptake in vegetation with the bulk of the rootzone growing in clean cover soil, but with a potenial for some deeper roots to extend through the cover materilal and come into contact with overburden material.
5	na	18	na	To evaluate the rate of selenium uptake in vegetation growing on cover where rootzones have a low probability of coming into contact with overburden material.
6	na	18	12	To evaluate the rate of selenium uptake in vegetation growing on cover where rootzones will likely not come into contact with overburden material.
7	na	24	24	To evaluate the rate of selenium uptake in vegetation growing on cover where rootzones will likely not come into contact with overburden material.

Table 4-2
Conda Woodall Mountain Mine
Plant Species Mix Summary

Common Name	Scientific Name	Plant Type	Summary of Literature Rooting Depth Info	Cultivars to consider[1]	PLS/lb[2]	Lbs PLS/ac	Percentage of lbs PLS/ac	PLS/ac	Percentage of PLS/ac
Big Bluegrass (Sandberg bluegrass)	*Poa secunda*	Grass	Shallow extensive fibrous roots, sometimes spreading by short rhizomes. Some of the roots have a wide lateral spread, often running nearly parallel with the soil surface at depths of only 2 to 3 inches for distances of 1 to 1.5 feet. Usually, they run more obliquely or even vertically downward. Root depth appears to vary considerably with soil conditions. Undoubtedly, in and climates where frequent light sprinkling is practiced, the roots are very superficial, but in deep moist subsoils, they have been found at depths of 5 to 7 feet.	Sherman	1046960	0.5	3%	523480	14.1%
Western Wheatgrass	*Pascopyrum smithii*	Grass	Strongly rhizomatous with slender creeping underground rootstocks in a dense, shallow, fibrous root system to a depth of 8 inches with deep-feeding roots that penetrate to 5 feet in arid regions.	Recovery	118000	3	17%	354000	9.6%
Mountain Brome	*Bromus marginatus*	Grass	Shallow; extensive, fibrous root system; fibrous root system is well-branched; descriptions of root depth range from shallow to deeply penetrating; in Idaho, mountain brome belongs to group of grasses with roots that are concentrated in the upper 1.2 inches of soil, from which they spread laterally and downward; it is suggested that short-lived perennial species like mountain brome penetrate only the upper ~16 inches of soil, whereas longer-lived perennials produce many more roots that can extend to a depth of ~63 inches in more arid conditions.	Bromar	64080	4	23%	256320	6.9%
Orchard grass	*Dactylis glomerata*	Grass	Dense network of non-rhizomatous roots; roots are medium-sized, fibrous; deep roots; most root development in the upper 3 inches of soil but extends to at least 18 inches below the surface in more arid conditions.	Paiute	427200	1	6%	427200	11.5%
Smooth Brome	*Bromus inermis*	Grass	Strongly rhizomatous; most of the root biomass tends to occurr in the first 3 inches of soil; roots can extend as long as 9 feet in more arid conditions.	Manchar	2315000	0.25	1%	578750	15.6%
Pubescent Wheatgrass (Intermediate wheatgrass)	*Agropyron intermedium*	Grass	Mildly rhizomatous, sod-forming. It is a long-lived cool season grass with short rhizomes and a deep feeding root system. Heaviest root production in upper 8 inches of soil.	Luna	64799	5	29%	323995	8.7%
Sheep Fescue	*Festuca ovina*	Grass	Upper 8 inches; fine fibrous roots	Marco Polo	530320	1	6%	530320	14.3%
Slender Wheatgrass	*Elymus trachycaulus*	Grass	Roots are fibrous; extending up to 20 in with tillers and very short rhizomes; dense	FistStrike	135000	2.5	14%	337500	9.1%
Tufted Hairgrass	*Deschampsia cespitosa*	Grass	Most mass in upper 4 inches, approximately 45 percent of root mass in the upper 0.8 inch of soil, with lower proportions in each succeeding 0.8 inch	Nortran	1500000	0.25	1%	375000	10.1%
					Total	**17.5**	**100%**	**3706565**	**100%**

Notes:

ac - acre

sq ft - square foot

Lbs PLS/ac- pounds of pure live seed/acre (broadcast rate)

1 - Cultivars based on those used at other regional facilities; actual cultivars dependent on availability at time of project implementation.

2 - seed/pound (lb) info obtained from Granite Seed Company (2011)

Sources:

Granite Seed Company. 2011. Seeds (online inventory information). Available at http://www.graniteseed.com/ (Accessed April 2011).

Table 5-1
Conda Woodall Mountain Mine
Summary of Proposed FSPS Sampling

Sample Media	Sampling Schedule	Sampling Timing[1]	Additional Sampling Information	Primary Samples per Cell[2]		Total Number of Samples/Surveys per Year[2]			Total Number of Samples/surveys during Pilot Study[4]	
				Number of Composite Samples	Number of Sub-samples per Composite Sample	Primary	Quality Control[3]		Primary	QC[3]
							Field duplicate samples	Equipment rinsate samples		
Dinwoody Formation Soil Sampling Prior to Excavation	Year 0 only	Prior to FSPS construction	from weathered profile in test pits in borrow area	10	5 subsamples (1 composite profile sample per test pit. 5 test pits per composite)	10	1	1	10 samples	2 samples
Dinwoody Formation Soil Stockpile Sampling			sampling of each truck load	1 per truck load	30 subsamples/ composite	20	1	1	20	2 samples
Manure Stockpile Sampling			sampling of each truck load	1 per truck load	30 subsamples/ composite	10	1	1	10 samples	2 samples
Elemental Sulfur Sampling			sampling of bags	1 per 20 bags	1 subsample/ bag	3	1	1	3 samples	2 samples
Overburden Sampling (Prior to the Addition of Soil Cover and Amendment)		Prior to plot construction	0-12 inch samples; random locations	1	30 subsamples/ composite	1 composite samples x 21 plots = **21 samples**	2	2	21 samples	4 samples
Soil Sampling (Following the Addition of Soil Cover and Amendment)		During FSPS construction	0-12 inch samples; random locations	1	30 subsamples/ composite	1 composite samples x 21 plots = **21 samples**	2	2	21 samples	4 samples
General Condition Observational Surveys	Year 1 to Year 5	Mid-summer	Survey for each cell	1	na	1 survey x 21 plots = **21 surveys**	na	na	105 surveys	na
Photographic Documentation			One established photo point per cell	1	na	1 photo x 21 plots = 21 photos	na	na	105 photos	na
Vegetation: Community Composition Monitoring			Equally-spaced grid with 36 intersection points sampled using a modified Step Point method	na	36 points/grid	1 grid x 21 plots = 21 community composition surveys	na	na	105 surveys	na
Vegetation: lifeform specific sample (Grasses)			One grass sample composited from the grid subsampling locations	1	36 subsamples/ composite	1 composite sample x 21 plots = 21 samples	2	1	105 samples	15 samples
Vegetation: lifeform specific sample (Forbs)			One forb sample composited from the grid subsampling locations	1	36 subsamples/ composite	1 composite sample x 21 plots = 21 samples	2	1	105 samples	15 samples
Co-located Soil Sample			One 0-12 inch sample composited from the grid subsampling locations	1	36 subsamples/ composite	1 composite from each plot = 21 samples	2	1	105 samples	15 samples

Table 5-1
Conda Woodall Mountain Mine
Summary of Proposed FSPS Sampling

Sample Media	Sampling Schedule	Sampling Timing[1]	Additional Sampling Information	Primary Samples per Cell[2]		Total Number of Samples/Surveys per Year[2]			Total Number of Samples/surveys during Pilot Study[4]	
				Number of Composite Samples	Number of Sub-samples per Composite Sample	Primary	Quality Control[3]		Primary	QC[3]
							Field duplicate samples	Equipment rinsate samples		
Soil Sampling to Evaluate Selenium Transport from Overburden Into Cover Systems	Year 1 to Year 5	Mid-summer	0-1, 4-5, and 8-9 inches from 12-inch cover	1	3 subsamples/ composite	1 composite for three depth intervals from one replicate plot for each system x 4 = 12 samples	1	1	60 samples	10 samples
			0-1, 4-5, 8-9, 12-13, and 15-16 inches from 18-inch cover	1	3 subsamples/ composite	1 composite for five depth intervals from one replicate plot for each system x 4 = 20 samples	1	1	100 samples	10 samples
			0-1, 4-5, 8-9, 12-13, and 15-16 inches from 18-inch cover	1	3 subsamples/ composite	1 composite for five depth intervals from one replicate plot for each system x 4 = 20 samples	1	1	100 samples	10 samples
			0-1, 4-5, 8-9, 12-13, 15-16, 16-18, and 19-21 inches from 24-inch cover	1	3 subsamples/ composite	1 composite for seven depth intervals from one replicate plot for each system x 4 = 28 samples	2	2	140 samples	20 samples
Root presence/absence observation	Year 5	Mid-summer	One 5-feet trench per plot	na	na	na	na	na	21 surveys	na

Notes:

na - not applicable

1 - Mid-summer = July/early August.

2 - Sampling rates based on 21 test plots.

3 - Field duplicate samples collected at a rate of one for every ten field samples; equipment rinsate samples collected at a rate of one for every 20 field samples.

4 - Duration of pilot study: Set-up during Year 0 and monitoring during Year 1 through Year 5.

Table 5-2
Conda Woodall Mountain Mine
Summary of Analytical Methods, Reporting Limits, and Accuracy and Precision Criteria

Media	Analytical Parameter	Method[1]	Reporting Limit	Data Quality Indicators	
				Accuracy Measures and Control Limits[1]	Precision Measures and Control Limits[1]
Manure	Ammonia-N	AOAC 973.49 & EPA 350.2, SMEWW 4500-NH3F, or EPA 351.2 & ISO 11732	NA[2]	LCS Recovery: 75%-125% ICB/CCB: <lower limit of quantitation SRMs: 55%-166%	MS/MSD RPD: <50%
	Antimony, Arsenic, Barium, Boron, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Strontium, Thallium, Tin Vanadium, Zinc	EPA Method 3050B, AOAC 990.08			
	C:N Ratio	Calculated			
	Fecal coliform	EPA Method 1680			
	Mercury	SW846 7471-A			
	Moisture	AOAC 925.04			
	Nitrate-N	1:5 Extraction KCl, colorimetric determination, Method WCC-103 S-3.50			
	pH, Salts	AOAC 973.4			
	Phosphorous	AOAC 985.01, EPA 3051, or EPA 3050			
	Germination	TMECC 05.09-B			
	Respiration	TMECC 5.08A			
	Sulfur	SM-3114C			
	Total Carbon (C)	SW846 9060			
	Total Nitrogen (N)	AOAC 990.3			
Pelletized Sulfur	Selenium, Sulfur	SM-3114C			
Soil	Ammonium-N	WCC-103 WREP-125 2nd ed. S-3.50	NA[2]		
	Boron, Sulfate	WCC-103 WREP-125 2nd ed. S-4.60			
	Calcium, Sodium, Magnesium, Potassium	WCC-103 WREP-125 2nd ed. S-5.10			
	Cation exchange capacity	Compulsive Exchange Method			
	Copper, Iron, Mangenese, Zinc	WCC-103 WREP-125 2nd ed. S-6.10			
	Nitrate-N	WCC-103 WREP-125 2nd ed. S-3.10			
	Percent organic matter	WCC-103 WREP-125 2nd ed. S-9.20			
	pH	WCC-103 WREP-125 2nd ed. S-2.20			
	Phosphorus	WCC-103 WREP-125 2nd ed. S-4.60, S-4.10, or S-4.20			
	Plant available phosphorous				
	Soluble salts	Saturated Paste Method			
	Selenium	SM-3114C	0.2 mg/kg		
Vegetation	Selenium	7742	0.1 mg/kg		
Water	Total Selenium	SM-3114C	0.001 mg/l		

1 Specific methods, reporting limits and control limits may change based on the laboratory that performs the analyses. The laboratory's control limits may be used for the LCS recovery.

2 No reporting limits included, since standards do not exist for agronomic or composted manure

AOAC: Association of Official Analytical Chemists
EPA: Environmental Protection Agency
ISO: International Oranization for Standardization
SMEWW: Standard Methods for the Examination of Water and Wastewater
SRM: Standard Reference Material
NA: Not Applicable

TMECC: Test Methods for Examination of Compost
WCC:Western Coordinating Committee
WREP: Western Regional Extension Publication

Table 7-1
Conda Woodall Mountain Mine
Proposed Schedule Plant Uptake Field Scale Pilot Study

	FIELD SCAL PILOT STUDY ACTIVITIES		
Task Name	**Duration (Days)**	**Start**	**Finish**
Field Scal Pilot Study (FSPS)	***409***	***Friday, July 15, 2011***	***Friday, June 30, 2017***
Implementation Planning Documents	***116***	***Friday, July 15, 2011***	***Monday, June 25, 2012***
Deliverable - Draft FSPS Work Plan		Friday, July 15, 2011	Friday, July 15, 2011
Agency Review	39	Monday, July 18, 2011	Friday, August 26, 2011
Deliverable - Response to Agency Comments	11	Monday, August 29, 2011	Friday, September 09, 2011
Telecon to Discuss Responses		Friday, September 16, 2011	Friday, September 16, 2011
Deliverable - Draft-Final FSPS Work Plan	17	Friday, September 09, 2011	Monday, September 26, 2011
Agency Review	7	Thursday, September 29, 2011	Friday, October 07, 2011
Deliverable - Final FSPS Work Plan		Friday, November 04, 2011	Friday, November 04, 2011
Agency Review	21	Monday, November 07, 2011	Monday, November 28, 2011
Deliverable - Revised Final FSPS Work Plan		Thursday, May 31, 2012	Thursday, May 31, 2012
Agency Review	21	Friday, June 01, 2012	Friday, June 22, 2012
Agency Approval		Monday, June 25, 2012	Monday, June 25, 2012
FSPS Implementation	***153***	***Monday, June 18, 2012***	***Tuesday, November 20, 2012***
Stormwater Control Construction, Clearing/Grubbing, Borrow Development	21	Monday, June 18, 2012	Monday, July 09, 2012
Grading Activities	100	Monday, July 09, 2012	Wednesday, October 17, 2012
Plot Construction	25	Friday, October 19, 2012	Tuesday, November 13, 2012
Revegetation	7	Tuesday, November 13, 2012	Tuesday, November 20, 2012
FSPS Sampling and Reporting	***140***	***Monday, June 25, 2012***	***Friday, June 30, 2017***
Year 0 sampling (Construction Related Sampling)		Monday, June 25, 2012	Tuesday, November 06, 2012
Deliverable - Draft Study Implementation Completion Report	45	Tuesday, November 06, 2012	Friday, December 21, 2012
Agency Review	32	Friday, December 21, 2012	Tuesday, January 22, 2013
Deliverable - Response to Agency Comments	21	Wednesday, January 23, 2013	Wednesday, February 13, 2013
Telecon to Discuss Responses		Wednesday, February 27, 2013	Wednesday, February 27, 2013
Deliverable - Final Study Implementation Completion Report	28	Thursday, February 28, 2013	Thursday, March 28, 2013
Agency Review	14	Tuesday, April 02, 2013	Tuesday, April 16, 2013
Agency Approval		Monday, April 29, 2013	Monday, April 29, 2013
Year 1 Sampling		Monday, July 08, 2013	Friday, August 30, 2013
Year 2 Sampling		Monday, July 07, 2014	Friday, August 29, 2014
Year 3 Sampling		Monday, July 06, 2015	Monday, August 31, 2015
Year 4 Sampling		Wednesday, July 06, 2016	Friday, August 26, 2016
Year 5 Sampling		Thursday, July 06, 2017	Friday, August 25, 2017
Draft Annual Report 1 (year 0 and 1 data)	by	Friday, January 31, 2014	
Draft Annual Report 2 (year 0 through 2 data)	by	Friday, January 30, 2015	
Draft Annual Report 3 (year 0 through 3 data)	by	Friday, January 29, 2016	
Draft Annual Report 4 (year 0 through 4 data)	by	Tuesday, January 31, 2017	
Draft FSPS Evaluation Report (year 0 through 5 data)	by	Wednesday, January 31, 2018	

FIGURES

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Legend

- Road
- Unimproved Road
- TRAIL, 4WD
- TRAIL, OTHER THAN 4WD
- Intermittent Stream
- Perennial Stream
- Boundary

J.R. SIMPLOT COMPANY

CONDA/WOODALL MOUNTAIN MINE
PLANT UPTAKE FIELD PILOT STUDY

FIGURE ES-1

AERIAL PHOTO
FIELD SCALE
PILOT STUDY AREA LOCATION

PRJ: 0442-001-900	DATE: JUN. 28, 2011
REV: 0	BY: CRL FOR: FLC

FORMATION ENVIRONMENTAL

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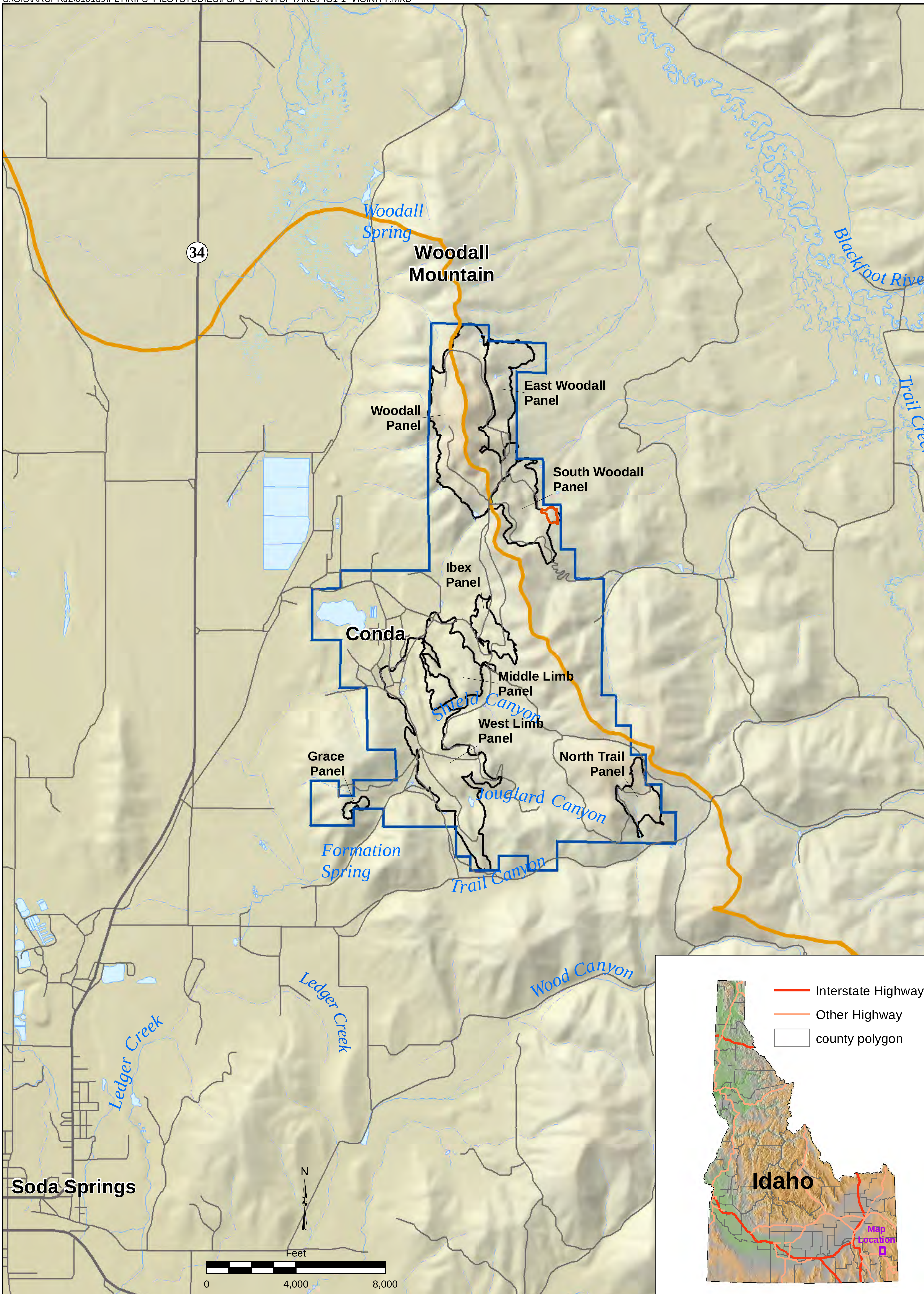

Legend

Primary Road		Mine Panels	
Secondary Road		BLackfoot / Bear River Drainage Divide	
Intermittent Stream		Mine Boundary	
Perennial Stream		PilotStudyArea	
Pond or Lake			
Marsh or Wetland			

J.R. SIMPLOT COMPANY
CONDA/WOODALL MOUNTAIN MINE
PLANT UPTAKE FIELD SCALE PILOT STUDY

FIGURE 1-1

CONDA / WOODALL MOUNTAIN PHOSPHATE MINE LOCATION

PRJ: 0442-001-900	DATE: MAY. 18, 2011	
REV: 0	BY: CRL	CHECKED: RPS

FORMATION ENVIRONMENTAL

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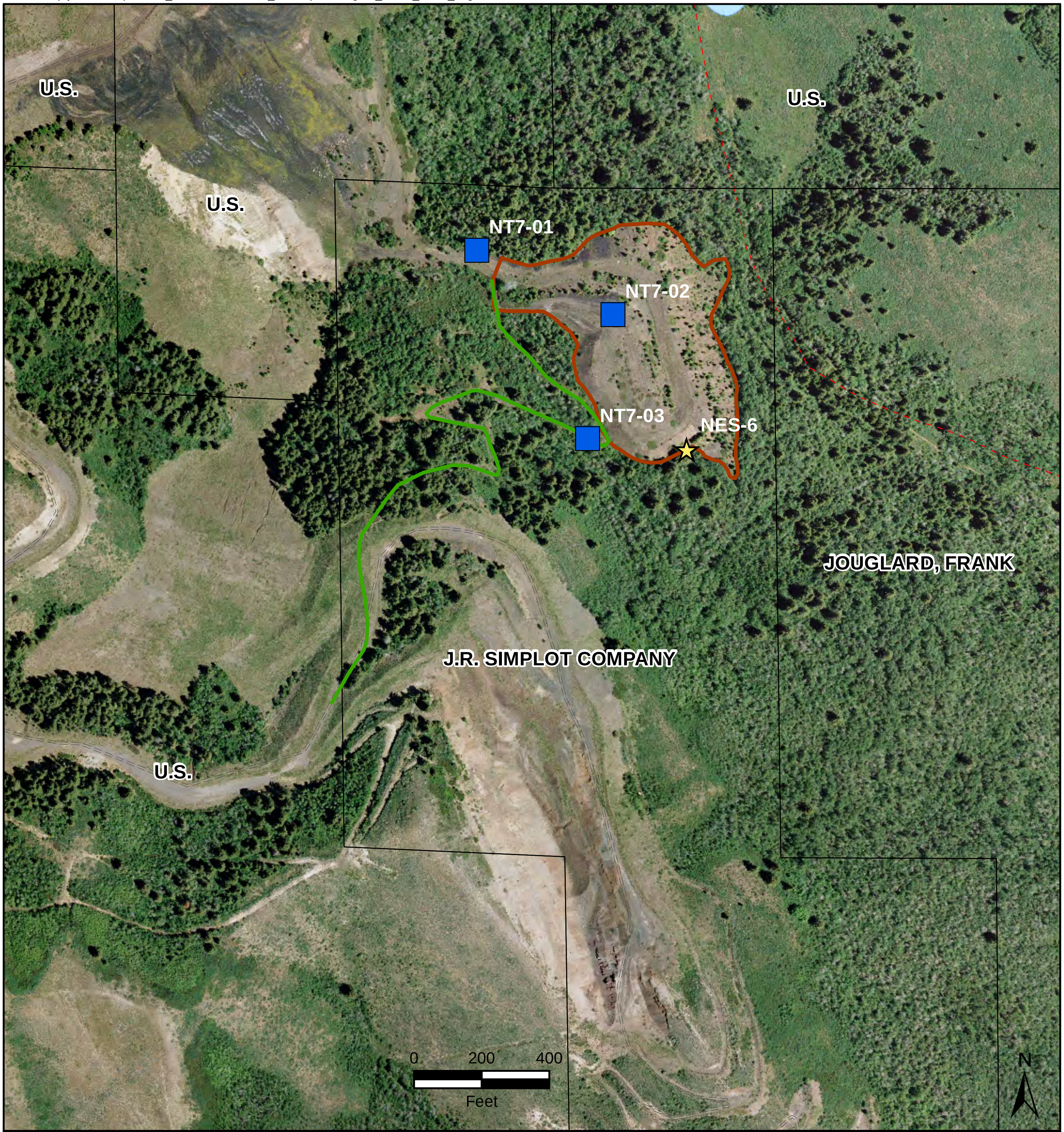


Legend

- Road
- Unimproved Road
- TRAIL, 4WD
- TRAIL, OTHER THAN 4WD
- Intermittent Stream
- Perennial Stream
- Boundary
- Sediment Sample Location
- Soil Sample Location
- Vegetation Sample Location
- Road

J.R. SIMPLOT COMPANY

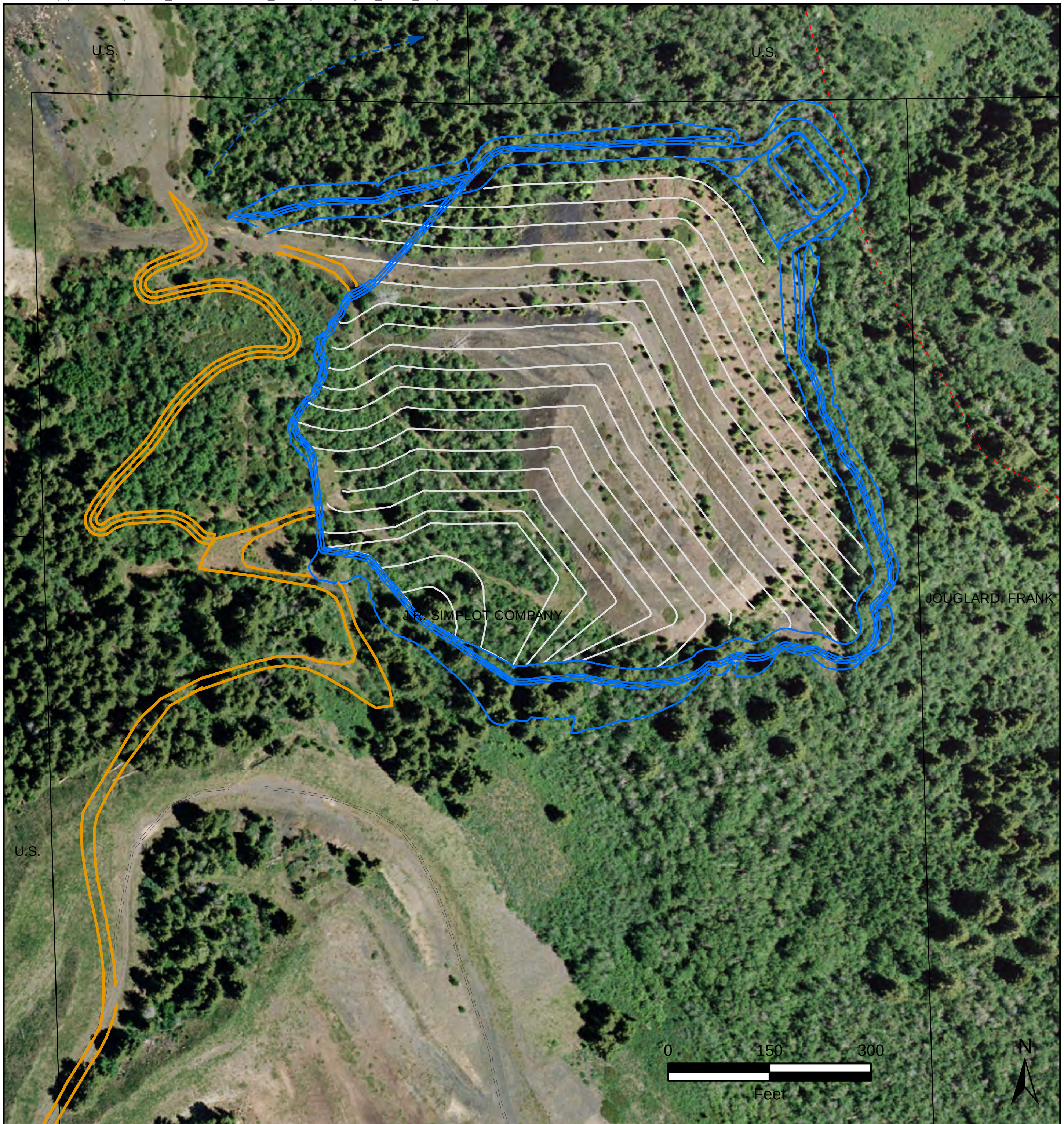
CONDA/WOODALL MOUNTAIN MINE
PLANT UPTAKE FIELD PILOT STUDY

FIGURE 2-1

AERIAL PHOTO FIELD SCALE PILOT STUDY AREA LOCATION

PRJ: 0442-001-900	DATE: OCT. 20, 2011
REV: 0	BY: CRL FOR: FLC

FORMATION ENVIRONMENTAL



Legend

Regrade Contours

Storm Water Controls

Access Road

J.R. SIMPLOT COMPANY

CONDA/WOODALL MOUNTAIN MINE
PLANT UPTAKE FIELD PILOT STUDY

FIGURE 4-1

FIELD SCALE PILOT STUDY
REGRADE AREA

PRJ: 0442-001-900	DATE: NOV. 10, 2011
REV: 0	BY: CRL FOR: FLC

FORMATION ENVIRONMENTAL

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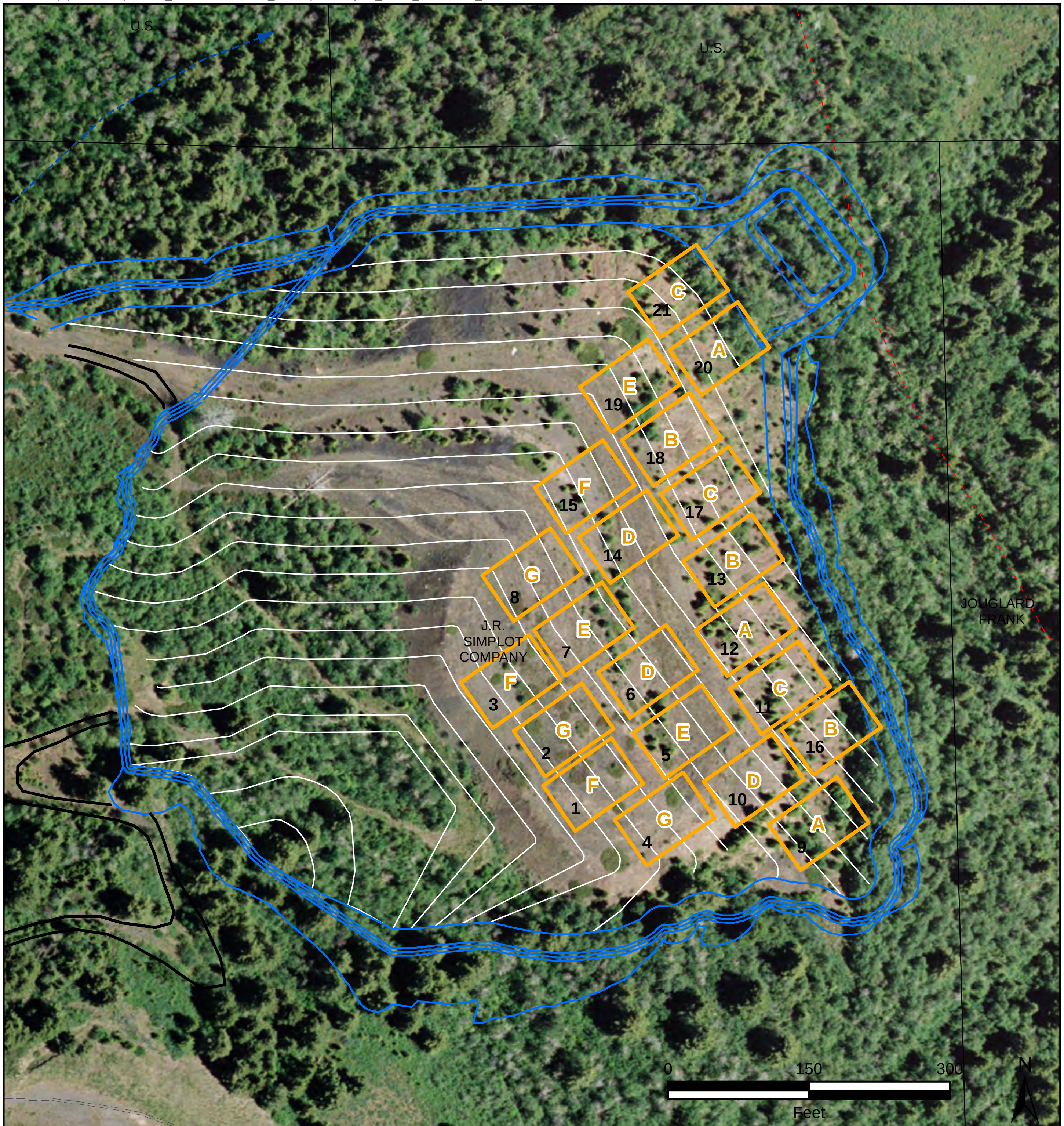

Legend

Regrade Contours
Storm Water Controls
Access Road
Approximate Plot Boundary

A - Direct Revegetation of Un-Amended Overburden
B - Direct Revegetation of Sulfur-Amended Overburden
C - Direct Revegetation of Manure-Amended Overburden
D - 12 Inches of Vegetative Cover
E - 18 Inches of Vegetative Cover
F - 18 Inches of Vegetative Cover with 12 inch Capillary Break
G - 24 inches of Vegetative Cover with 24 inch Capillary Break

J.R. SIMPLOT COMPANY

CONDA/WOODALL MOUNTAIN MINE
PLANT UPTAKE FIELD PILOT STUDY

FIGURE 4-2

FIELD SCALE PILOT STUDY
PLOT DETAILS

PRJ: 0442-001-900	DATE: FEB. 02, 2012	
REV: 0	BY: CRL	FOR: FLC

FORMATION ENVIRONMENTAL

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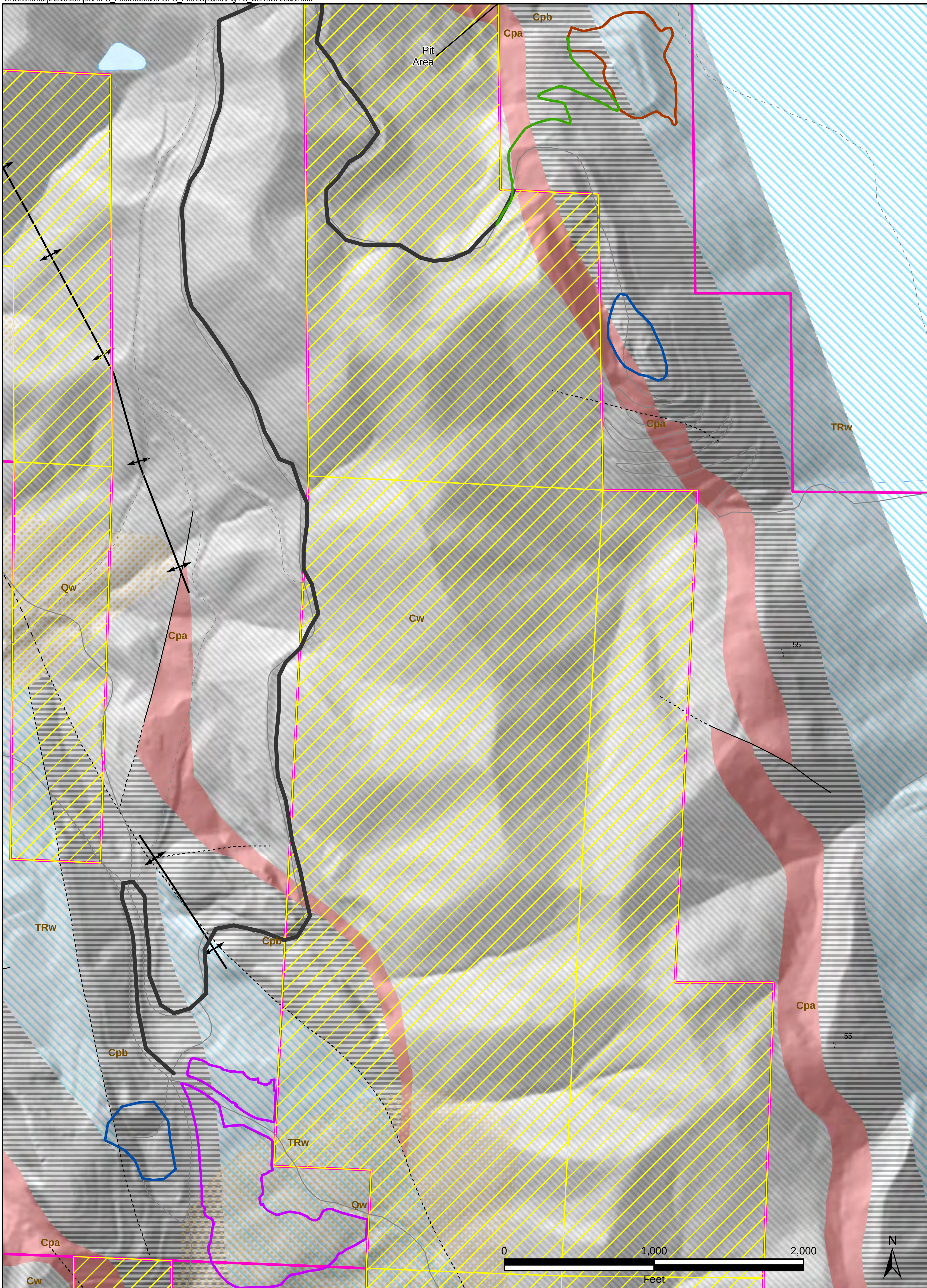


Legend

- Road
- Primary Highway
- Secondary State or County Highway
- Local Street or Road
- Other Road or Street
- 4WD Trail
- Trail, Other than 4WD
- Anticline, <Null>
- Syncline, <Null>
- Thrust Fault, <Null>
- Fault, <Null>
- Fault, Confirmed
- Fault, Buried
- Fault, Inferred
- Strike/Dip
- Strike/Dip Overturned
- Qal - Gravel, sand, and silt (alluvium)
- Qw - Sand, gravel, and silt (hill wash/alluvium)
- Tsl - Salt Lake Formation
- TRd - Dinwoody and Woodside Formations
- Cpb - Rex Chert
- Cpa - Meade Peak Member
- Cw - Wells Formation - Park City Formation, undifferentiated
- Haul Route
- BLM
- J.R. Simplot Co.
- Private
- Intermittent Stream
- Perennial Stream
- Pond or Lake
- Marsh or Wetland
- Soil Borrow Area
- Rex Chert Borrow Area
- Pilot Study Area

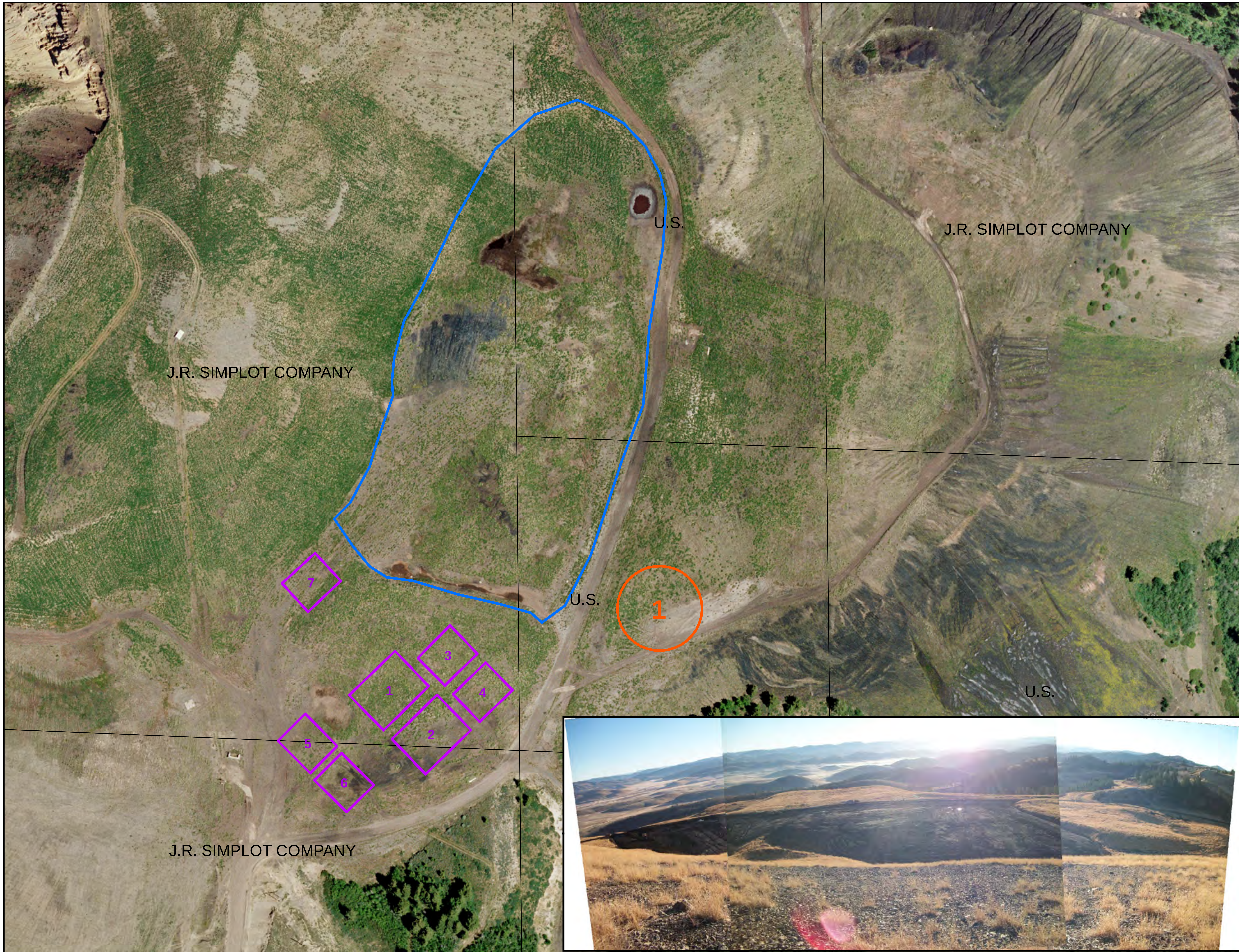
J.R. SIMPLOT COMPANY
CONDA/WOODALL MOUNTAIN MINE
PLANT UPTAKE FIELD SCALE PILOT STUDY

FIGURE 4-3

DINWOODY FORMATION AND REX CHERT BORROW AREAS

PRJ:	DATE: SEP. 26, 2011	
REV:	BY: CRL	FOR: RPS

FORMATION ENVIRONMENTAL



Legend

- Property Ownership Boundaries
- Test Fill Pads — *General Test Fill Pad Locations (numbering corresponds to test fill pads proposed in the memorandum)*
- 2010 Site Maintenance
- Potential Overburden Source Areas

Area 1 would be the main source of overburden material for the test pads

0 200 400
Feet

N

J.R. SIMPLOT CO.
CONDA/WOODALL MOUNTAIN MINE
FIELD-SCALE PLANT UPTAKE PILOT

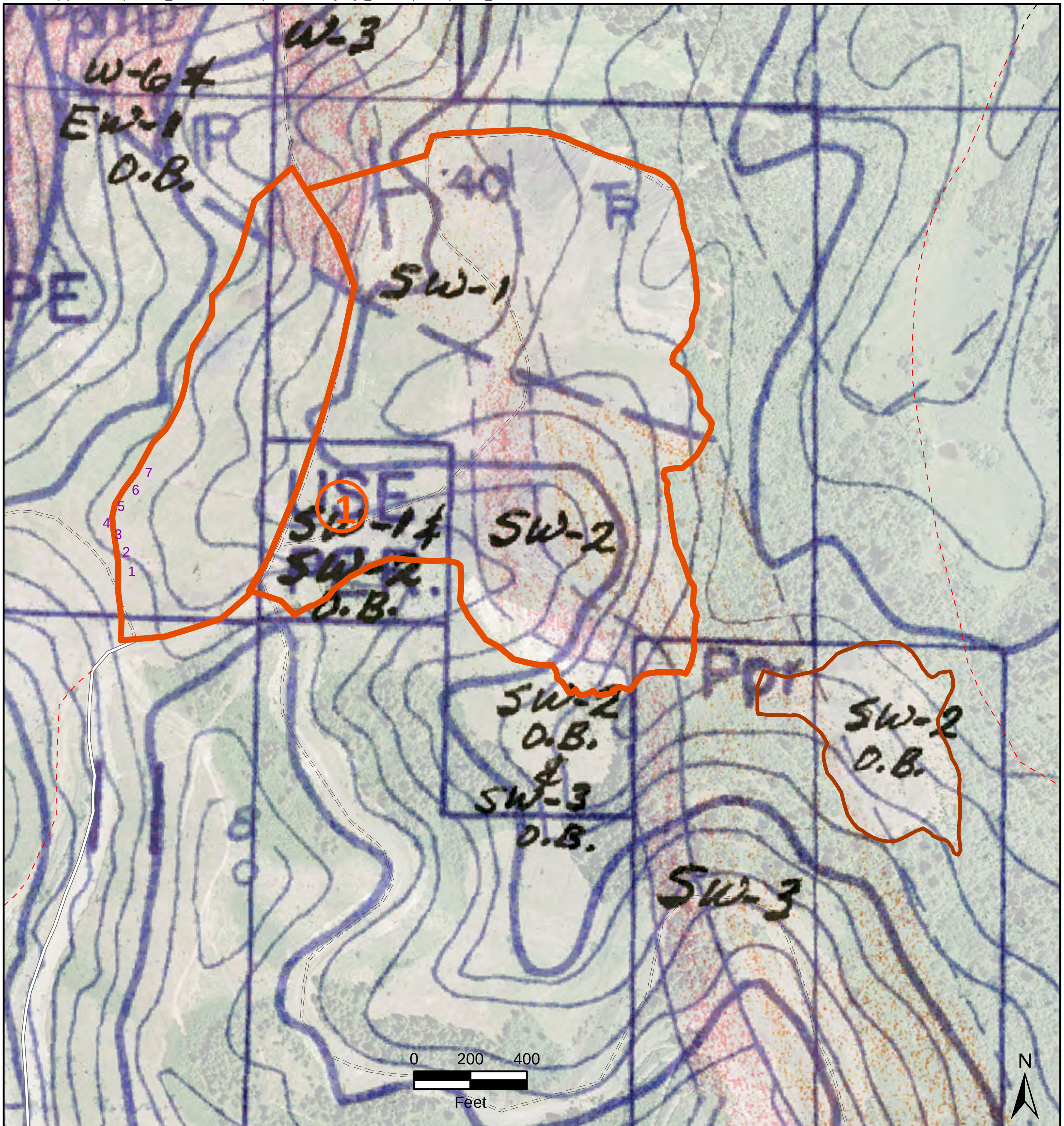
FIGURE 4-4

PROPOSED TEST PAD LOCATIONS

DATE: MAY. 17, 2012		FORMATION ENVIRONMENTAL
BY: CRL	FOR: RPS	

S:\GIS\arcprj2\010139\plt\RIFS_PilotStudies\CompactionTesting\Fig1_MethdSpecStudy.mxd

S:\GIS\arcprj2\010139\plt\RIFS_PilotStudies\CompactionTesting\Fig3_MethdSpecStdyFSPS_aerial.mxd



Legend

- Road
- Unimproved Road
- TRAIL, 4WD
- TRAIL, OTHER THAN 4WD
- Intermittent Stream
- Perennial Stream
- FSPS Boundary
- Pedro Creek ODA NTCRA Boundary

J.R. SIMPLOT COMPANY

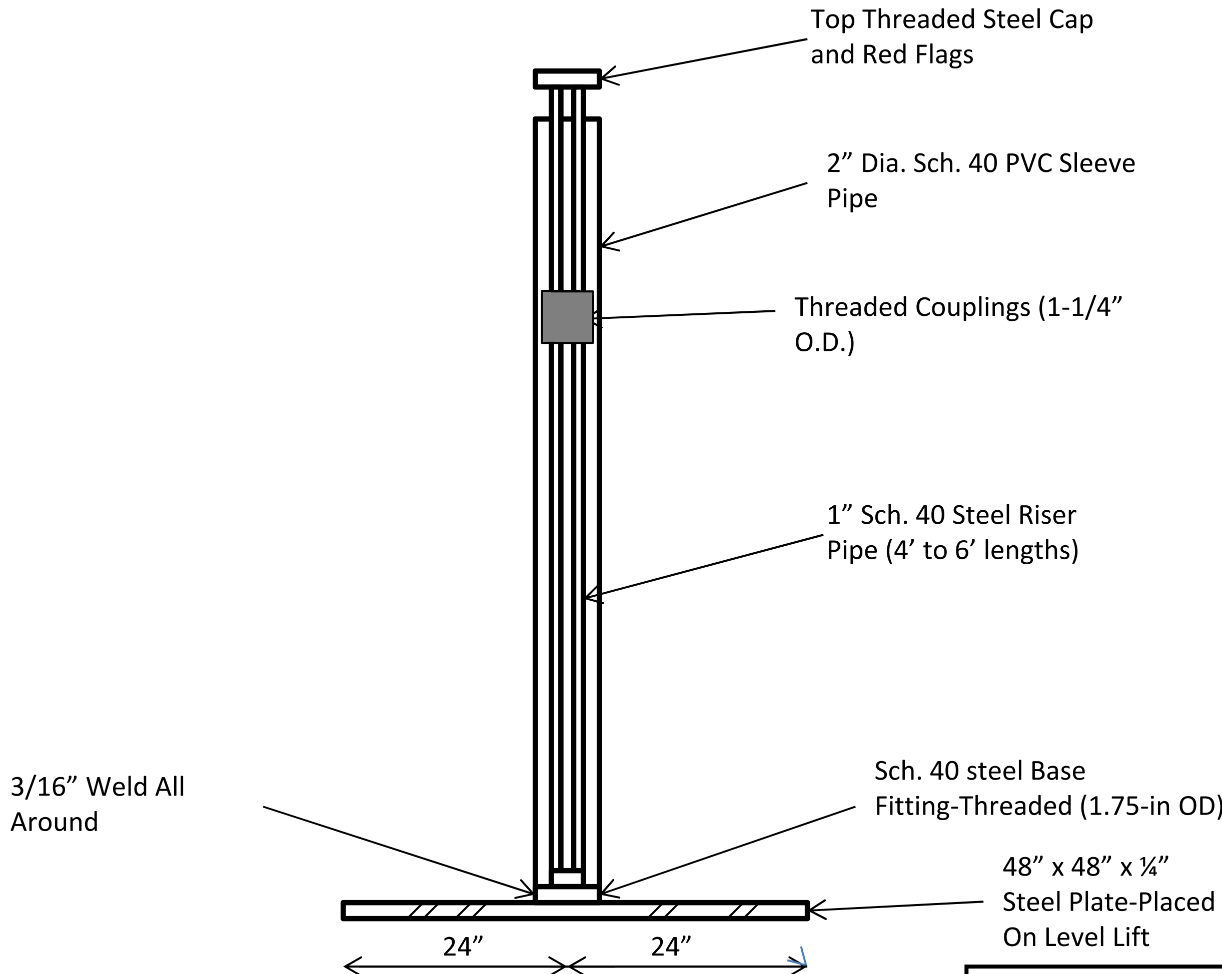
CONDA/WOODALL MOUNTAIN MINE
FIELD-SCALE PLANT UPTAKE PILOT

FIGURE 4-5

MINE PANELS AND OVERBURDEN DISPOSAL AREAS

PRJ: 0442-001-900	DATE: MAY. 17, 2012	
REV: 0	BY: CRL	FOR: FLC

FORMATION ENVIRONMENTAL



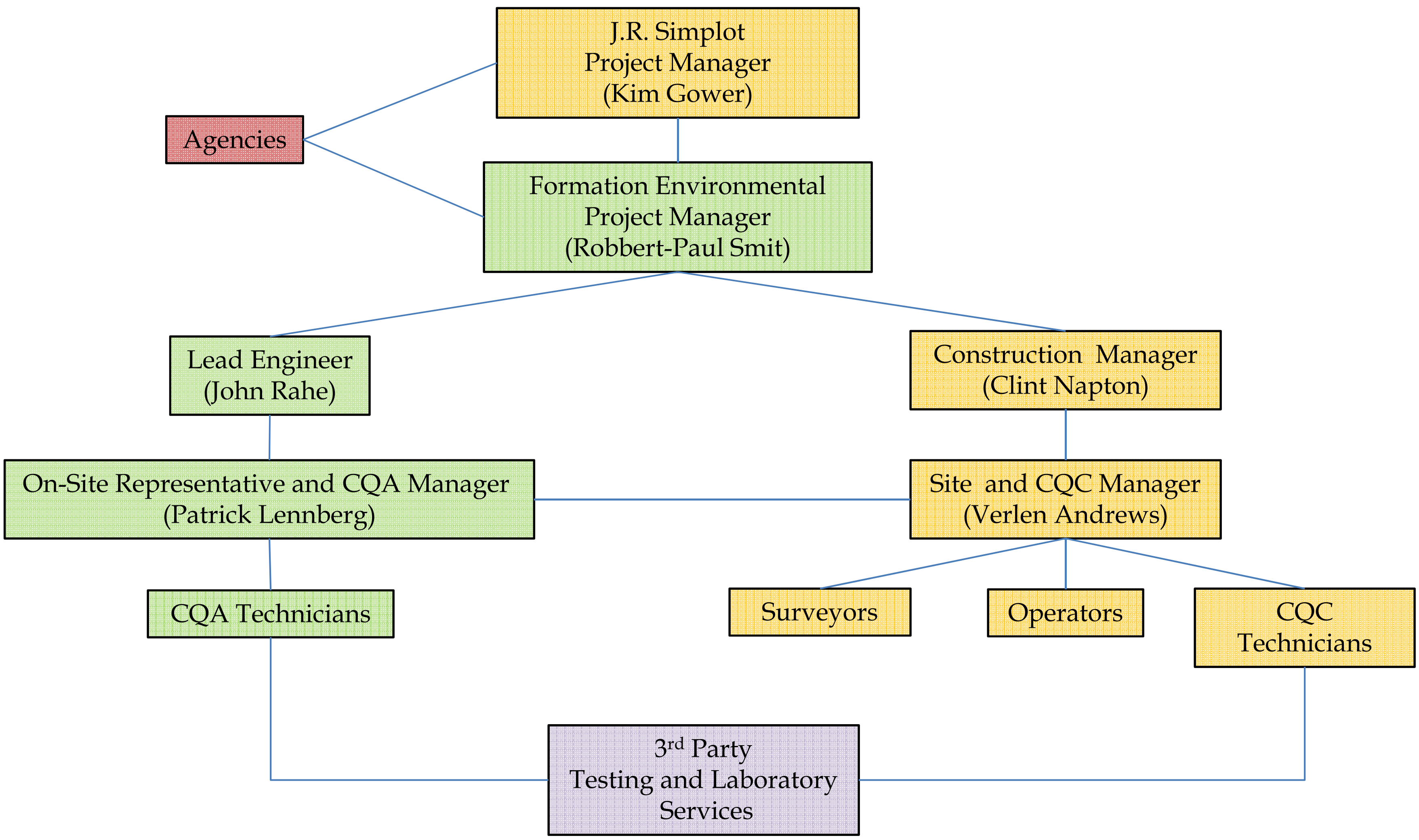
J.R. SIMPLOT COMPANY
Conda/Woodall Mountain Mine
Field-Scale Plant Uptake Pilot Study

FIGURE 4-6
TYPICAL SETTLEMENT PLATE

PRJ: 009-001	MAY 17, 2012	
REV: 2	BY: CMH	CHK:RPS

FORMATION ENVIRONMENTAL

Figure 4-7
Construction Quality Control and Quality Assurance Organization



S:\GIS\arcprj2\010139\plt\RIFS_PilotStudies\FSPS_PlantUptake\Fig5-1_FSPS_PlotSampleLocs.mxd

Legend

- Year 1 Sample Location
- Year 2 Sample Location
- Year 3 Sample Location
- Year 4 Sample Location
- Year 5 Sample Location
- 5 ft Contours

J.R. SIMPLOT COMPANY

CONDA/WOODALL MOUNTAIN MINE
PLANT UPTAKE FIELD PILOT STUDY

FIGURE 5-1

FIELD-SCALE PILOT STUDY EXAMPLE SAMPLING GRID

PRJ: 0442-001-900	DATE: JUN. 27, 2011	
REV: 0	BY: CRL	FOR: RPS

FORMATION ENVIRONMENTAL

APPENDIX A
FSPS AREA PHOTOS

FSPS Overburden Pile - View Facing West

FSPS Overburden Pile - View Facing South

APPENDIX B
SOPs

J.R. SIMPLOT COMPANY – CONDA MINE

STANDARD OPERATING PROCEDURE No. 5

SAMPLE CUSTODY, PACKAGING, AND SHIPMENT

1.0 SCOPE AND APPLICABILITY

The following Standard Operating Procedure (SOP) describes the protocol for sample custody, packaging and shipment of samples collected during environmental monitoring and geotechnical investigations at the Conda Mine site. The procedures presented herein are intended to be general in nature and are applicable when referenced by a monitoring or sampling and analysis plan. If warranted, appropriate revisions may be made when approved in writing by the Project Manager.

This SOP applies to any liquid or solid sample that is being transported by the sampler, a courier or an overnight delivery service.

2.0 BASIS FOR METHODOLOGY

The methods and procedures described in this SOP were developed from the following sources:

- 49 CFR 173. Shippers – General Requirements for Shipping. United States Code of Federal Regulations available online at http://www.gpoaccess.gov/cfr/index.html
- 49 CFR 178. Specifications for Packaging. United States Code of Federal Regulations available online at http://www.gpoaccess.gov/cfr/index.html
- ASTM D 4220. Standard Practice for Preserving and Transporting Soil Samples. American Society for Testing and Materials available online at http://www.astm.org/
- ASTM D 4840. Standard Practice for Sampling Chain-of-Custody Procedures. American Society for Testing and Materials available online at http://www.astm.org/

3.0 PROCEDURES

The objectives of this packaging and shipping SOP are to minimize the potential for sample breakage, leakage or cross contamination; to provide for preservation at the proper temperature; and to provide a clear record of sample custody from collection to analysis.

3.1 Packaging Materials

The following is a list of materials that will be needed to facilitate proper sample packaging:

- Chain-of-Custody Record forms (Figure SOP-5-1);
- Coolers (insulated ice chests) or other shipping containers as appropriate to sample type;
- Transparent packaging tape;
- Zip-lock type bags (note: this is used as a generic bag type, not a specific brand name);
- 5-gallon buckets for large-volume geotechnical bulk samples;
- Protective wrapping and packaging material;
- Contained ice (packaged and sealed to prevent leakage when melted) or "Blue Ice" (required for environmental samples only); and
- Chain-of-Custody seals.

3.2 Sample Custody from Field Collection to Laboratory

After samples have been collected, they will be maintained under chain-of-custody procedures. These procedures are used to document the transfer of custody of the samples from the field to the designated analytical laboratory. The same chain-of-custody procedures will be used for the transfer of samples from one laboratory to another, if required.

The field sampling personnel will complete a Chain-of-Custody Record and Request for Analysis form (Figure SOP-14-1) for each separate container of samples to be shipped or delivered to the laboratory for chemical or physical (geotechnical) analysis. Information contained on the triplicate, carbonless form will include:

1. Project identification;
2. Date and time of sampling;
3. Sample identification;
4. Sample matrix type;
5. Sample preservation method(s);
6. Number and types of sample containers;
7. Sample hazards (if any);
8. Requested analysis(es);
9. Requested sample turnaround time;
10. Method of shipment;
11. Carrier/waybill number (if any);
12. Signature of sampling personnel;
13. Name of Project Manager;
14. Signature, name and company of the person relinquishing and the person receiving the samples when custody is being transferred;
15. Date and time of sample custody transfer; and
16. Condition of samples upon receipt by laboratory.

The sample collector will cross out any blank space on the Chain-of-Custody Record and Request for Analysis (CC/RA) form below the last sample number listed on the part of the form where samples are listed. The samples will be carefully packaged into shipping containers/ice chests.

The sampling personnel whose signature appears on the CC/RA form is responsible for the custody of a sample from time of sample collection until the custody of the sample is transferred to a designated laboratory, a courier, or to another employee for the purpose of transporting a sample to the designated laboratory. A sample is considered to be in their custody when the custodian: (1) has direct possession of it; (2) has plain view of it; or (3) has securely locked it in a restricted access area.

Custody is transferred when both parties to the transfer complete the portion of the CC/RA form under "Relinquished by" and "Received by." Signatures, printed names, company names, and date and time of custody transfer are required. Upon transfer of custody, the sampling personnel who relinquished the samples will retain the third sheet (pink copy) of the CC/RA form. When the samples are shipped by a common carrier, a Bill of Lading supplied by the carrier will be used to document the sample custody, and its identification number will be entered on the CC/RA form. Receipts of Bills of Lading will be retained as part of the permanent documentation in the project file.

3.3 Sample Custody within Laboratory

The designated laboratory will assume sample custody upon receipt of the samples and CC/RA form. Sample custody within the analytical laboratory will be the responsibility of designated laboratory personnel. The laboratory will document the transfer of sample custody and receipt by the laboratory by signing the correct portion of the CC/RA form. Upon receipt, the laboratory sample custodian will note the condition of the samples by checking the following items:

1. Agreement of the number, identification and description of samples received by comparison with the information on the CC/RA form; and

2. Condition of samples (any bottle breakage; leakage, cooler temperature, etc.).

If any problems are discovered, the laboratory sample custodian will note this information on the "Laboratory Comments/Condition of Samples" section of the CC/RA form, and will notify the sampling personnel or Project Manager immediately. The Project Manager will decide on the final disposition of the problem samples.

The laboratory will retain the second sheet (yellow copy) of the CC/RA form and return the first sheet (white original) to originator with the final laboratory report of analytical results. The original of the CC/RA form will be retained as part of the permanent documentation in the project file.

A record of the history of the sample within the laboratory containing sample status and storage location information will be maintained in a logbook, or a computer sample tracking system, at the laboratory. The following information will be recorded for every sample access event:

1. Sample identification;
2. Place of storage;
3. Date(s) and time(s) of sample removal and return to storage;
4. Accessor's name and title;
5. Reason for access; and
6. Comments/observations (if any).

The laboratory will provide a copy of the logbook or computer file information pertaining to a sample upon request.

3.4 Sample Custody During Inter-Laboratory Transfer

If samples must be transferred from one laboratory to another, the same sample custody procedures discussed above will be followed. The designated laboratory person (sample custodian) will complete a CC/RA Record (Figure SOP-5-1 form or similar) and sign as the originator. The laboratory relinquishing the sample custody will retain a copy of the completed form. The laboratory receiving sample custody will sign the form, indicating transfer of custody, retain a copy, and return the original record to originator with the final laboratory report of analytical results. The CC/RA Record will be retained as part of the permanent documentation in the project file.

3.5 Packaging and Shipping Procedure

All sample containers will be properly labeled and all samples will be logged on the Chain-of-Custody Request for Analysis form in accordance with the procedures explained.

All environmental samples will be packed in the cooler so as to minimize the possibility of breakage, cross-contamination and leakage. Before placing the sample containers into the cooler, all sample bottle caps will be checked and tightened if necessary. Bottles made of breakable material (e.g., glass) will also be wrapped in protective material (e.g., bubble wrap, plastic gridding, or foam) prior to placement in the cooler. Each bottle or soil liner will be placed into two zip-lock bags to protect from cross-contamination and to keep the sample labels dry. Sample containers will be placed upright in the cooler. Stacking glass sample bottles directly on top of each other will be avoided.

If required by the method, environmental samples will be preserved to 4°C prior to the analysis. Water ice or "blue ice" will be used to keep the sample temperatures at 4°C. The ice will be placed in two zip-lock bags if the samples are to be transported by someone other than the sampler (e.g., a courier or overnight delivery service). The zip-lock bags of ice will be placed in between and on top of the sample containers so as to maximize the contact between the containers and the bagged ice. If the sampler is transporting the samples to the laboratory shortly after sample collection, the water ice may be poured over and between the sample bottles in the cooler. When samples are collected from remote locations, a higher ratio of ice to sample will be used for packing, to account for the longer transport times.

If there is any remaining space at the top of the cooler, packing material (e.g., styrofoam pellets or bubble wrap) will be placed to fill the balance of the cooler. After filling the cooler, the top will be closed and the cooler shaken to verify that the contents are secure. Additional packaging material will be added if necessary.

When transport to the laboratory by the sampler is not feasible, sample shipment will occur via courier or overnight express shipping service that guarantees shipment tracking and next morning delivery (e.g., Federal Express Priority Overnight). In this case, the chain-of-custody records will be placed in a zip-lock bag and the bag will be placed on top of the contents within the cooler. The cooler will be taped shut with packaging tape. Packaging tape will completely encircle the cooler, and a chain-of-custody seal will be signed and placed across the packaging tape, and across at least one of the opening points of the container.

Copies of all shipment records provided by the courier or overnight delivery service will be retained and maintained in the project's file.

To further ensure that samples from remote areas reach the laboratory at the proper temperature and within holding times, a number of revised procedures will also be implemented: (1) zip-lock bags of ice will not only be placed in between and on top of the sample containers, but also beneath the sample containers, so as to maximize the contact between the containers and the bagged ice; (2) higher ratios of ice to sample will be used for packing; and (3) samplers will avoid leaving coolers out in the sun in order to minimize melting of the ice.

All geotechnical samples will be preserved and transported in accordance with ASTM D-4220. These will include Group A and B (bulk soil samples) and Group C (Intact) soil samples. Highly sensitive intact clay soils (Group D) are not anticipated, although if encountered in the field, procedures for handling such materials shall be followed in accordance with the standards. All samples shall be properly sealed, taped or otherwise packaged as necessary to prevent sample drying, leakage or damage during transport in accordance with the standards for the particular type of sample. All samples shall be properly marked with boring or test pit number, depth of sample below ground surface and date of sample. Samples shall be packed tightly in adequate shipping containers to prevent damage during shipping in accordance with the standard, and all intact samples must be prevented from freezing prior to delivery to the laboratory.

3.6 Documentation and Records Management

Daily Field Records or a field notebook with field notes will be kept describing the packaging procedures and the method of shipments. Copies of all shipping records and chain-of-custody records will be retained in the project files.

All environmental samples shall have properly completed Chain-of-Custody and Request-for-Analysis forms and all geotechnical samples shall have properly completed Sample Identification/Traceability Record (Controlled Document).

4.0 QUALITY ASSURANCE

The Project Manager or designated reviewer will check and verify that documentation has been completed and filed per this procedure.

5.0 REFERENCES

49 CFR 173. Shippers – Shippers – General Requirements for Shipping. United States Code of Federal Regulations available online at http://www.gpoaccess.gov/cfr/index.html

49 CFR 178. Specifications for Packaging. United States Code of Federal Regulations available online at http://www.gpoaccess.gov/cfr/index.html

ASTM D 4220. Standard Practice for Preserving and Transporting Soil Samples. American Society for Testing and Materials available online at http://www.astm.org/

ASTM D 4840. Standard Practice for Sampling Chain-of-Custody Procedures. American Society for Testing and Materials available online at http://www.astm.org/

Chain of Custody Page 1 of 1

FORMATION ENVIRONMENTAL

2500 55th St., Suite 200
Boulder, CO 80301
Phone: 303-442-0267
Fax: 303-442-3679

Project Contact
Courier/Airbill:
Shipped to:

PO #: 009-001

Telephone:

COC #:

Sampling Point	Location	Field ID	Date/Time	# of Containers	Sample Type	Analysis	Lab QC	Comments

Total Number of Containers:

Sampler Signature: ____________________

Relinquished by	Date/Time	Received by	Date/Time

LAB USE ONLY—Sample condition on Receipt

FIGURE SOP 5-1

J.R. SIMPLOT COMPANY – CONDA MINE

STANDARD OPERATING PROCEDURE No. 9

SOIL SAMPLING FOR INORGANIC COMPOUNDS

1.0 INTRODUCTION

This Standard Operating Procedure (SOP) is a general guidance document for soil sampling for inorganic compounds. When this procedure is referenced by a monitoring or sampling and analysis plan, field personnel shall sample as described below. This SOP is not applicable for the collection of volatile organic compounds (VOCs), or samples where the analyte(s) may react with the sampling equipment. This SOP defines sample collection procedures using hand augers, shovels/trowels, and soil core samplers.

2.0 BASIS FOR METHODOLOGY

The methods and procedures described in this SOP were developed from these sources:

- U.S, EPA Region 9 Laboratory – Field Sampling Guidance Document #1205 Soil Sampling

3.0 PROCEDURES

Soil samples may be collected using a variety of methods and equipment. Surface soil samples are typically collected from the ground surface to 2 inches below ground surface (bgs). Samples collected from greater than 2 inches bgs are referred to as subsurface soil samples. Soil samples may be collected as grab samples or as composite samples. The sample method is determined based on the physical characteristics of the site and matrix.

Grab sample: A sample taken from a particular location. Grab samples are useful in determining discrete concentrations, but also allow evaluation of spatial variability when multiple samples are collected.

Composite sample: A number of approximately equal-volume samples that are individually collected from differing locations then combined (homogenized) into a single sample for subsequent analysis. Care should be taken to ensure that each subsample is of approximately equal volume. Composite samples are useful when averaged or normalized concentration estimates of a waste stream or an area are desired.

4.0 EQUIPMENT AND TECHNIQUES

Surface and subsurface soil samples shall be obtained using hand augers, shovels/trowels, or soil core samplers.

Hand Auger: A hand auger consists of a stainless steel tube with two sharpened spiral wings at the tip. The auger typically cuts a 2-inch to 3-inch diameter boring. Because the auger is hand-driven, penetration in dense or gravelly soil may be difficult. For soil sample collection, the procedures outlined below shall be followed.

Shovel/Trowel: Various shovel/trowel designs and sizes are commercially available for a variety of sampling applications. These devices are hand-driven and are typically used for sampling relatively soft, unconsolidated soil deposits. Some designs (e.g., the Sharpshooter™) can be driven into hard, rocky soil by opening a deep, narrow hole. Shovels or trowels used for surface soil sampling shall be made of stainless steel.

Soil Core Sampler: Soil core samplers consist of variable diameter (commonly 1-2 inches), stainless-steel tubes that can be attached to a hammer using a cap to allow for driving into surface soil. The steel tubes can also be fitted with aluminum or stainless steel liners for the collection of undisturbed samples. Polyethylene liner caps are used to seal the ends of the tube after sample collection. Soil core samplers can be used to obtain soil samples for chemical or geotechnical analysis. The use of liners allows for the collection of undisturbed samples, minimal loss of volatiles, and easy shipping to the analytical laboratory.

Selection of a sampling device is most often contingent upon the physical characteristics of the medium to be sampled.

5.0 SAMPLE COLLECTION PRESERVATION, CONTAINERS, HANDLING AND STORAGE

Chemical preservation of soils for inorganic analysis is generally not needed. Cooling is usually sufficient, supplemented by analysis within the appropriate holding time.

Using the appropriate equipment, retrieve approximately equal volume soil samples from the desired depth (2 inches or less for surface soil samples, greater than 2 inches for subsurface soil samples). Transfer soil sub-samples from the sample collection device into a large, air-tight, re-sealable plastic bag and homogenize. To homogenize composite samples, seal the bag and mix the contents manually by hand kneading. Particle size reduction may take place during mixing. Prior to field homogenization, remove twigs, rocks, leaves and other undesirable debris if they are not considered part of the sample. Sample contents will be re-homogenized at the lab prior to sample analysis.

Using a stainless steel or plastic scoop or equivalent, transfer the soil to the appropriate sample container, if necesssary. Wide-mouth glass containers with Teflon-lined caps or Ziploc© baggies, depending on the sample volume needed, are utilized for soil samples.

Document sample location on field logbook including any changes in protocol and locate using a site map or global positioning system (GPS).

6.0 DECONTAMINATION

All equipment used in the sampling process shall be decontaminated prior to field use and between sample locations. Refer to SOP 13 (Equipment Decontamination) for specific instructions.

7.0 QUALITY ASSURANCE AND QUALITY CONTROL

There are no specific QA activities which apply to the implementation of these sampling procedures. However, the following QA/QC procedures apply:

- Duplicate, rinsate, and matrix spike samples will be collected at the frequencies documented in the field sampling plan.
- All sampling data must be documented in the field logbooks and/or field forms, including rational deviations from this SOP.
- The Field Team Leader or designated QA reviewer will check and verify that field documentation has been completed per this procedure and other procedures referenced herein.
- All equipment must be operated according to the manufacturer's specifications, including calibration and maintenance.

8.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow the project specific health and safety procedures.

9.0 REFERENCES

U.S. EPA Region 9. Field Sampling Guidance Document #1205- Soil Sampling

J.R. SIMPLOT COMPANY – CONDA MINE

STANDARD OPERATING PROCEDURE No. 13

EQUIPMENT DECONTAMINATION

1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) describes the methods to be used for the decontamination of all reusable field equipment which could become contaminated during use or during sampling. The equipment may include split spoons, bailers, trowels, shovels, hand augers or any other type of equipment used during field activities.

Decontamination is performed as a quality assurance measure and a safety precaution. It prevents cross contamination between samples and also helps to maintain a clean working environment.

Decontamination is achieved mainly by rinsing with liquids which may include: soap and/or detergent solutions, tap water, distilled weak acid solution, and/or methanol or other solvent. Equipment may be allowed to air dry after being cleaned or may be wiped dry with chemical-free towels or paper towels if immediate re-use is necessary.

At most project sites, decontamination of equipment that is re-used between sampling locations will be accomplished between each sample collection point. Waste produced by decontamination procedures, including waste liquids, solids, rags, gloves, etc., should be collected and disposed of properly, based upon the nature of contamination. Specific details for the handling of decontamination wastes are addressed in the Sampling and Analysis Plan. These procedures are applicable when referenced in a monitoring or sampling and analysis plan.

2.0 BASIS FOR METHODOLOGY

The methods and procedures described in this SOP were developed from these sources:

- ASTM D5088. Standard Practice for Decontamination of Field Equipment Used at Nonradioactive Waste Sites. American Society for Testing and Materials available online at http://www.astm.org/

- Parker and Ranney, 1997a. Decontaminating Ground Water Sampling Devices, CRREL Special Report 97-25, U.S. Army Engineer Cold Regions Research and Engineering Laboratory, Hanover, NH.

- Parker and Ranney, 1997b. Decontaminating Materials Used in Ground Water Sampling Devices, CRREL Special Report 97-24, U.S. Army Engineer Cold Regions Research and Engineering Laboratory, Hanover, NH.

3.0 PROCEDURES

3.1 Responsibilities

It is the responsibility of the field sampling coordinator to ensure that proper decontamination procedures are followed and that all waste materials produced by decontamination are properly managed. It is the responsibility of the project safety officer to draft and enforce safety measures that provide the best protection for all persons involved directly with sampling and/or decontamination.

It is the responsibility of any subcontractors (i.e., drilling contractors) to follow the proper, designated decontamination procedures that are stated in their contracts and outlined in the Site-Specific Health and Safety Plan. It is the responsibility of all personnel involved with sample collection or decontamination to maintain a clean working environment and ensure that any contaminants are not negligently introduced to the environment.

3.2 Supporting Materials

1. Cleaning liquids: soap and/or detergent solutions (Alconox, etc.), tap water, distilled water, methanol, weak nitric acid solution, etc.

2. Personal protective safety gear as defined in the Site-Specific Health and Safety Plan.

3. Chemical-free towels or paper towels.

4. Disposable, nitrile gloves.

5. Waste storage containers: drums, boxes, plastic bags, etc.

6. Cleaning containers: plastic and/or stainless steel pans and buckets.

7. Cleaning brushes.

8. Aluminum foil.

3.3 Methods

The extent of known contamination will determine the degree of decontamination required. If the extent of contamination cannot be readily determined, cleaning should be done according to the assumption that the equipment is highly contaminated. Decontamination procedures should account for the types of contaminants known or suspected to be present. In general, high levels of organic contaminants should include an organic solvent wash step, and high levels of metals contamination should include a weak acid rinse step.

The procedures listed below constitute the full field decontamination procedure. If different or more elaborate procedures are required for a specific project, they may be specified in sampling and analysis or work plan. Such variations in decontamination protocols may include all, part or an expanded scope of the decontamination procedure stated herein.

1. Remove gross contamination from the equipment by dry brushing, and rinse with tap water.

2. Wash with soap or laboratory-grade detergent solution.

3. Rinse with tap water.

4. Rinse with methanol (optional, for equipment potentially contaminated by organic compounds).

5. Rinse with acid solution (optional, for equipment potentially contaminated by metals).

6. Rinse with distilled or deionized water.

7. Repeat entire procedure or any parts of the procedure as necessary.

8. Air dry.

Decontaminated equipment should be stored in sealable containers, such as zip-lock type plastic bags or cases or boxes with lids.

3.4 DOCUMENTATION

Field notes will be kept describing the decontamination procedures followed. The field notes will be recorded according to procedures described in the SOP entitled Field Documentation (SOP 16).

4.0 QUALITY CONTROL

To assess the adequacy of decontamination procedures, field rinsate blanks may be collected. The specific number of rinsate blanks will be defined in a sampling and analysis or work plan or by the Project Manager. In general, at least one field rinsate blank should be collected per sampling event or per day.

Rinsate blanks with elevated or detected contaminants will be evaluated by the Project Manager, who will relay the results to the site workers. Such results may be indicative of inadequate decontamination procedures that require corrective actions (e.g., re-training).

5.0 REFERENCES

ASTM D5088. Standard Practice for Decontamination of Field Equipment Used at Nonradioactive Waste Sites. American Society for Testing and Materials available online at http://www.astm.org/

Parker and Ranney, 1997a. Decontaminating Ground Water Sampling Devices, CRREL Special Report 97-25, U.S. Army Engineer Cold Regions Research and Engineering Laboratory, Hanover, NH.

Parker and Ranney, 1997b. Decontaminating Materials Used in Ground Water Sampling Devices, CRREL Special Report 97-24, U.S. Army Engineer Cold Regions Research and Engineering Laboratory, Hanover, NH.

J.R. SIMPLOT COMPANY – CONDA MINE

STANDARD OPERATING PROCEDURE No. 16

FIELD DOCUMENTATION

1.0 SCOPE AND APPLICABILITY

The following Standard Operating Procedure (SOP) describes the protocol for documenting field activities of environmental monitoring and geotechnical investigations at J.R. Simplot Company's Conda Mine.

When this procedure is referenced by a monitoring or sampling and analysis plan, field personnel shall document field activities in the field notebook and on formatted field records or data sheets, as described below. The field notes and formatted records/data sheets will be part of the project file; all records must be filled out carefully and completely by one of the personnel actually performing the field activities.

2.0 BASIS FOR METHODOLOGY

The methods and procedures described in this SOP were developed from ANSI, ASTM and USEPA guidelines (ANSI, 1994; ASTM D 1586, D 2487, D 2488, D5434 and D 6089; USEPA, 1995).

3.0 PROCEDURES

3.1 Daily Field Activities

The field representative will record all daily field activities in the field notebook for each day of field work. Documentation will include:

A. Project identification;

B. Date;

C. Time on job (beginning and ending time);

D. Weather conditions;

E. Activity description;

F. List of personnel and visitors on site;

G. Safety equipment used and monitoring performed;

H. Waste storage inventory (if any);

I. Chronological record of activities and events;

J. Comments and variances from project work plan;

K. Content of telephone conversations; and

L. Signature of the field representative.

The field representative will document all details that would be necessary to recreate the day's activities and events at a later time. The field notebook will be used to document field activities that may not be specified on other field record forms. Other activity-specific documentation requirements to be recorded are discussed in the Standard Operating Procedure for each activity.

4.0 DOCUMENTATION

4.1 Field Record Forms

In addition to the field notebook, field personnel will complete specific field record forms applicable to the field activities being conducted. The procedures for completion of activity-specific field record forms are presented in the applicable Standard Operating Procedures. Additional field record forms and applicable procedures may be created for project-specific activities, as necessary.

4.2 Boring and Test Pit Logging

All geotechnical boring and test pit logs will be completed to provide all necessary information and data regarding subsurface conditions in accordance with ASTM D-5434 and in accordance with SOP No. 18, Geotechnical Borings and Test Pits. This information will include soils and rock visual characterizations in accordance with ASTM D-2488, and Standard Penetration Resistance (blow counts) recorded in accordance with ASTM D-1586. Moisture conditions including initial and stabilized groundwater levels of subsurface strata will be noted on the logs and all sample types and locations shall be noted on the logs.

Draft boring and test pit logs will be prepared in the field and transferred to a logging program in the office. The draft logs will be compared with laboratory data from samples obtained from the particular boring or test pit and finalized for consistency of data and descriptions. Draft field soils descriptions will be revised if necessary in conformance with ASTM D-2487.

4.3 Records Management

All original field forms will be filed with the appropriate project's records along with finalized forms and data.

5.0 QUALITY ASSURANCE

5.1 Form Review and Filing

All completed field forms will be reviewed by the Project Manager or project designated reviewer. Any necessary corrections will be made in pen with a single-line strike out that is initialed and dated.

6.0 REFERENCES

American National Standards Institute/American Society for Quality Control, 1994. American National Standard Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs. ANSI/ASQC E-4.

ASTM D 1586. Standard Test Method for Penetration Test and Split-Barrel Sampling in http://www.astm.org/.

ASTM D 2487. Classification of Soils for Engineering Purposes; Unified Soil Classification System in http://www.astm.org/

ASTM D 2488. Description and Identification of Soils; Visual-Manual Procedure in http://www.astm.org/

ASTM D 5434. Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock at http://www.astm.org/

ASTM D 6089. Standard Guide for Documenting a Ground-Water Sampling Event. American Society for Testing and Materials available online at http://www.astm.org/

U.S. Environmental Protection Agency, 1995. EPA QA/G6, Guidance for the Preparation of Standard Operating Procedures (SOPs) for Quality Related Documents. EPA/600/R-96/027. Office of Research and Development, Washington, DC.

U.S. Environmental Protection Agency, 1998. EPA QA/G5, EPA Guidance for Quality Assurance Project Plans. EPA/600/R-98/018. Office of Research and Development, Washington, DC.

J.R. SIMPLOT COMPANY- CONDA/WOODALL MOUNTAIN MINE

STANDARD OPERATING PROCEDURE No. 18

VEGETATION COMMUNITY SAMPLING

1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) describes the protocols to be followed to conduct the vegetation community analyses. The purpose of the sampling is to provide both qualitative and quantitative analysis of the vegetation community. This SOP is a modification of the Step-Point Method outlined in USFS and BLM (1999). The Step Point Method involves making observations at points, using a pin to record cover “hits” at different heights above the ground. It measures cover for individual species, total cover, and species composition by cover (USFS and BLM, 1999). The procedures presented herein are intended to be general in nature and are applicable when referenced by a monitoring or sampling and analysis plan (SAP).

2.0 BASIS FOR METHODOLOGY

The methods and procedures described in this SOP are based on:

- United States Forest Service (USFS) and DOI Bureau of Land Management (BLM), 1999, Sampling Vegetation Attributes. Interagency Technical Reference BLM/RS/ST-96/002+1730.

3.0 PROCEDURES

3.1 Equipment

The following equipment is needed to conduct vegetation analyses:

- Field notebook, indelible marker
- Field guides
- Field data sheet (attached)
- Pin or dowel, approximately 3-4 feet long and ¼ inch diameter

3.2 Establishment of Observation Points

The location and number of observation points (e.g., transects, gridded points, etc.) within each sampling area will be determined as indicated in the SAP.

3.3 Step-Point Monitoring

At each observation point, a ¼ inch diameter pin or dowel with marks at 1 inch, 12-, 24- and 36-inches from the end will be lowered vertically until the end hits the ground. The ground level feature hit with the point of the pin as well as any vegetation intercepted by the pin at other levels will be recorded on the field data sheet by dot count tally. An example of the field data sheet for recording this information is attached. The ground-level hits will be recorded in the Ground-Level Cover section of the form, except where there are both ground-level and other level (i.e., basal or canopy cover hit) combinations. Ground-level/other level combinations will be recorded in the Basal and Canopy/Foliar Cover section of the form. A dot count tally will be recorded for each ground-level/other level combination when it is first entered on the form and then again each time this same combination is encountered at the observation points along the transect.

Ground-level hits (excluding basal vegetation hits) will fall into four cover categories. They can be redefined and/or additional categories added, depending on the site conditions. The four categories are litter (L), bare ground (B), gravel (G; particle sizes between 1/12 inch and 10 inches), and stone (S; greater than 10 inches). Basal hits on live vegetation are counted when the plant crown is at or below a 1 inch height above the ground. Level 1 hits on live vegetation are counted when vegetation is encountered between 1 to 12 inches above the ground. Level 2 hits on live vegetation are counted when vegetation is encountered between 13 to 24 inches above the ground. Level 3 hits on live vegetation are counted when vegetation is encountered between 25 to 36 inches above the ground. If vegetation is encountered above 36 inches above the ground, that can be noted accordingly on the field data sheet.

To supplement the observation point data, species that are opportunistically observed at the sampling location, but not encountered at the observation points, can also be recorded on the field data sheets.

3.4 Calculations

The recorded measurements will be used to calculate ground cover, vegetation cover, percent cover by cover category, percent cover by species, and percent cover by vegetation level (i.e., height).

Calculate the percent cover for each cover category by dividing the number of hits for each category by the total number of hits for all categories, including hits on vegetation. Ground cover is determined by dividing the total number of hits for all categories except bare ground by the total number of hits (including bare ground). Canopy/Foliar cover is determined by dividing the total number of hits on vegetation (includes all basal and canopy/foliar hits) by the total number of hits. Basal cover is determined by dividing the number of basal hits by the total number of hits. Diversity is described by the variety and number of species observed at the observation points, along with other observed species in the sampling area.

4.0 DOCUMENTATION

Documentation requirements are discussed in the previous section. Each sampling area should have a completed field data sheet and accompanying notes in the field notebook. An example of a field data sheet is attached. Location information (i.e., diagram, GPS coordinates, etc.) should also be recorded and photographs taken as needed.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

As a check on the completion of appropriate field documentation, the Field Supervisor will check and verify that documentation has been completed and filed per this procedure and the other procedures referenced herein on a routine basis.

6.0 REFERENCES

United States Forest Service (USFS) and DOI Bureau of Land Management (BLM), 1999, *Sampling Vegetation Attributes.* Interagency Technical Reference BLM/RS/ST-96/002+1730.

STEP-POINT COVER DATA SHEET

Sampling Area:	Description of Observation Points (transect, grid, etc.)	Date:	Time:
Field Personnel:		Weather:	

Ground-Level Cover						
Category	**B** = Bare ground	**L** = Litter	**G** = Gravel (2mm-8")	**S** = Stone (>8")	Vegetation	**Total**
Dot Count					*(see table below)*	
Total Hits						
% Cover						

Basal and Canopy/Foliar Cover					
Basal or Ground-Level (within 1" of ground-lev.)	Level 1 (2"-12" above ground)	Level 2 (13"-24" above ground)	Level 3 (25"-36" above ground)	Dot Count	Total Hits
				Total	

Species observed in vicinity, but not on transect:

Notes:

J.R. SIMPLOT COMPANY – CONDA/WOODALL MOUNTAIN MINE

STANDARD OPERATING PROCEDURE No. 20

TERRESTRIAL VEGETATION TISSUE SAMPLING

1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) describes the protocols to be followed to conduct the sampling of terrestrial vegetation. The purpose of the sampling is to provide vegetation samples for chemical analysis. This SOP is a modification of the IMA (1998) SOP-NW-19.0 that was established for the Area-Wide Investigation and SOP No. 17 established for the Conda/Woodall Mountain Mine Remedial Investigation (RI). Handling, shipping and storage of the collected samples is covered in SOP No. 7 (Sample Custody, Packaging, and Shipment). The procedures presented herein are intended to be general in nature and are applicable when referenced by a monitoring or sampling and analysis plan (SAP).

2.0 PROCEDURES

2.1 Equipment

The following equipment is needed to collect vegetation samples:

- Field notebook, indelible marker
- Field guides
- Detergent solution (0.1-0.3 % Alconox)
- Distilled water
- Latex gloves
- Stainless steel scissors or plant shears
- Ziploc bags
- Chain of custody and sample labels
- Vegetation sample collection form (if not fully documented in the field notebook)

2.2 Sampling Location and Vegetation Description

Vegetation sampling locations and number and placement of subsample locations within each sampling area will be determined as indicated in the SAP. The type of vegetation to be collected (e.g., lifeform-specific, species-specific, etc.) should also be identified in the SAP.

2.2.1 Vegetation Description

Prior to clipping vegetation, vegetation species should be identified at each subsample location and noted in the field notebook or field sampling sheet. If species cannot be identified in the field, a notation will be made and a sample should be collected for later identification.

2.2.2 Vegetation Collection

Above-ground vegetation at each subsample location will be collected using a freshly cleaned set of scissors or shears. Vegetation should be clipped to approximately one inch above of the soil surface. If woody species are present (i.e. sagebrush), the current year's growth should be collected rather than all aboveground material.

All of the collected vegetation (i.e., subsamples) should be composited into a single labeled Ziploc bag and field notebook or field sampling sheet completed. The collected samples will be kept cool in a cooler until they can be further processed in the laboratory.

2.3 Laboratory Processing

All vegetation samples will be submitted to the laboratory as unwashed samples. If the SAP outlines that samples are to be washed, then they will be washed of adhering particles by the laboratory prior to preparation for analysis. The plant samples will be weighed, rinsed three times with deionized water, and then dried for at least 24 hours at 60 +°C and re-weighed to determine percent moisture. The dried vegetation samples are then ready for chemical analysis. The dried samples will be finely ground (pass a

10-mesh screen) in a Wiley mill and the samples will be analyzed for chemicals identified in the SAP.

3.0 DOCUMENTATION

Documentation requirements are discussed in the previous section. Each collected plant sample should be associated with a completed field sampling form or notes in a field notebook. Location information (i.e., diagram, GPS coordinates, etc.) and pertinent vegetation community notes should also be recorded as needed.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

As a check on the completion of appropriate field documentation, the Field Supervisor will check and verify that documentation has been completed and filed per this procedure and the other procedures referenced herein on a routine basis.

For each sampling location, the sampler should don a fresh pair of latex gloves and use freshly cleaned sampling equipment. Equipment should be cleaned using the 0.1-0.3% Alconox solution and then rinsed at least twice with deionized water.

5.0 REFERENCES

IMA, 1998, *Sampling and Analysis Plan, Southeast Idaho Phosphate Resource Area Selenium Project, 1998 Regional Investigation*. Prepared for the Idaho Mining Association Selenium Subcommittee. Compiled by Montgomery Watson Americas, Inc., Bellevue Washington. April 1998.

J.R. SIMPLOT COMPANY – CONDA/WOODALL MOUNTAIN MINE

STANDARD OPERATING PROCEDURE No. 21

SOIL PROFILE ROOT OBSERVATIONS

1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) describes the protocols to be followed to conduct in-situ plant root observations and descriptions within a soil profile. The purpose of the sampling is to provide a description of the quantity, size, and location of roots throughout the profile. This SOP is based on root observation guidelines presented in the 1993 NRCS Soil Survey Manual. This SOP also provides methodology to extract roots from soil cores and quantify root length density (e.g., Tennant, 1975). The procedures presented herein are intended to be general in nature and are applicable when referenced by a monitoring or sampling and analysis plan (SAP).

2.0 PROCEDURES

2.1 Equipment

The following equipment is needed to make root observations within a soil profile:

- Field notebook, indelible marker
- Tape measure
- Nails (or other clearly seen markers such as golf tees)
- Trowel or flat-bladed knife
- One 10 cm X 10 cm square template (e.g., cardboard, plastic, etc.)
- Root observation form (if not fully documented in the field notebook)
- Digital camera

The following equipment is needed to observe roots in a soil core:

- Field notebook, indelible marker
- Detergent solution (0.1-0.3 % Alconox)
- Distilled water
- Scrub brush
- Latex gloves

- Ziploc bags
- Soil corer of desired width (e.g., bulb planter, PVC tube) or knife (and trowel/spoon)
- Sieve (e.g., No. 25 sieve)
- Forceps
- Water spray bottle and/or sink
- Silk screen cloth
- Surface with 1-2 cm square grid lines marked on it
- Chain of custody and sample labels
- Soil core sample collection form (if not fully documented in the field notebook)

2.2 Sampling Preparation

In the soil pit or trenched area, prepare the area to be assessed. Each assessment point will be one foot wide and extend from the surface to the bottom of the pit or trench. To prepare the soil profile at each assessment point, a trowel or flat-bladed knife will be used to scrape a few centimeters of soil off the profile to expose a fresh soil face. A tape measure can be set up along the side of the assessment area, from the surface to the bottom of the trench. Nails (or other clearly seen markers such as golf tees) can be placed into the soil at points of interest, for example to mark horizons, or at 12-inch intervals from the surface. Each horizon or 1-foot square interval will be photographed. If desired, observations and descriptions of the soil profile can be recorded (such as horizon thickness, horizon boundary, soil color, soil texture, rock descriptions, presence of redoximorphic features, pore spaces, plant cover, etc.); refer to 1993 NRCS Soil Survey Manual for more information.

2.3 In-Situ Root Observations

Location, size, and quantity of roots will be visually assessed in each interval of interest (within each horizon or in each 12-inch interval, etc.) by observing the soil face closely. Descriptions of the location of roots can be noted using example descriptors such as: between peds, in cracks, throughout, in root mat at top of horizon, matted around rock fragments, etc. In addition, observation notes can also be collected regarding live or dead (or inconclusive), color, flattening, nodulation, lesions, etc.

The quantity of roots is the number of roots per unit area and will be recorded for each size class of roots. The size of roots is based on the diameter size as follows:

- Very fine: <1 mm

- Fine: 1- 2 mm
- Medium: 2-5 mm
- Coarse: 5-10 mm
- Very coarse: >10 mm

The NRCS Soil Survey manual recommends the use of one dm^2 (a square that is 10 cm on one side, or 100 cm^2) as the unit area to be assessed for medium-sized roots. (If the roots are all fine, then a cm^2 area may be more appropriate; the size of the unit area should be determined based on conditions and study objectives) A one dm^2 area within the interval of interest will be marked (or a template will be used). If desired, a photograph of the unit area can be taken. The number of unit areas to be assessed depends on the size of the interval or horizon (e.g., could record one unit area for a 12-inch interval or average measurements from 3 representative areas for a larger area such as a horizon; this should also be based on site conditions and study objectives). The quantity of roots in the dm^2 unit area will be counted as follows for each size class of roots and recorded in the field notebook or on field data sheet:

- None: no roots observed.
- Few: <1 per unit area
- Common: 1 to <5 per unit area
- Many: >=5 per unit area

2.4 Root Observations from Soil Cores

If desired, soil core(s) can be collected from the soil profile so as to observe roots further. A soil corer of the desired diameter and length (e.g., PVC tube or “bulb planter” type corer) can be pushed, twisted, or hammered horizontally into the side of the vertical soil face (i.e., parallel to the soil surface) to extract the soil. The soil core will be pulled from the soil face and the soil will be extracted from the corer using a dowel or hands to push the material into a ziplock bag. In some cases (e.g., too rocky, too clayey, etc.), a corer may not be feasible to use. Another option is to use a knife to cut an area of interest to the desired length (e.g., one dm^3) and to use a spoon or trowel used to carefully excavate the soil from that area and place material into a ziplock bag. The implement used to extract the material and a description of the volume of material extracted should be recorded for each sample. If multiple samples are to be collected, then the coring implement can be scrubbed with a scrub brush and Alconox, and rinsed with water prior to the next sample.

The SAP will dictate if decontamination measures or gloved hands should be used for the samples. If so, then the sampler should don a fresh pair of latex gloves and use freshly cleaned sampling equipmen for each sample. Equipment should be cleaned using the 0.1-0.3% Alconox solution and then rinsed at least twice with deionized water.

The soil core sample(s) will then be chilled or frozen and returned to the laboratory for a closer inspection for presence of roots. The soil core will be placed into a sieve (e.g., No. 25 sieve) and washed gently with a stream of water to wash away soil and expose any roots. The presence/absence of roots and any other observation notes can be recorded for each sample. Once the soil has been washed away, the roots left behind on the sieve can be picked up using forceps and placed into ziplock bags. The roots can be stored in sealed plastic bags at - 15°C to remain firm and fresh prior to further analysis, if additional analysis is needed.

If an estimation of root length density (i.e., the length of roots per sample volume) is desired, then a line intersect method of estimation (e.g., Newman [1966] as modified by Tennant [1975]) can be used. The line intersect method involves spreading roots on a flat surface (e.g., on a silk screen cloth), taking care to avoid overlap between roots. The screen is then placed on a surface with marked gridlines (e.g., 1-2 cm grid square) and counting the number of intersections that the roots make with the grid lines. Root length density (cm/cm^2) is calculated from the number of intersections of the grid and the volume of the original soil core; refer to Tennant (1975) for further information on grid sizes and calculations.

3.0 DOCUMENTATION

Documentation requirements are discussed in the previous section. All observations of the soil profile and roots should be recorded in a field notebook or on a field data sheets. Each collected soil core sample should also be associated with a completed field sampling form or notes in a field notebook. Location information (i.e., diagram, GPS coordinates, etc.) should also be recorded as needed.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

As a check on the completion of appropriate field documentation, the Field Supervisor will check and verify that documentation has been completed and filed per this procedure and the other procedures referenced herein on a routine basis.

5.0 REFERENCES

Newman, E.I. 1966. A method of estimating the total length of root in a sample. Journal of Applied Ecology 3: 139-145.

Samson, B.K., and T.R. Sinclair. 1994. Soil core and minirhizotron comparison for the determination of root length density. Plant and Soil 161: 225-232.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. Available at http://soils.usda.gov/technical/manual/.

Tennant D. 1975. A test of a modified line intersect method of estimating root length. Journal of Ecology 63(3): 995-1001.

J.R. SIMPLOT COMPANY – CONDA/WOODALL MOUNTAIN MINE

STANDARD OPERATING PROCEDURE No. 22

NOXIOUS WEED GERMINATION TEST

1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) describes the protocols to be followed to collect a sample of compost or other plant-growth amendment and send it to a laboratory to conduct a noxious weed germination ("grow-out") test for that material. The purpose of the germination test is to evaluate a representative sample of the amendment to assure that it will not provide a vehicle for the introduction of noxious weeds. Although there is no official certification process for compost/manure to be considered certified weed-free in Idaho, the Idaho State Department of Agriculture (ISDA) has developed a process, in conjunction with the Idaho Department of Transportation (IDOT), to determine the weediness of potential compost sources. This widely accepted test consists of "growing out" samples of compost at the Idaho State Seed Lab (ISSL) to see if they are weed-free; all possible measures are taken to allow for potential growth of seedlings. The procedures outlined below are based on the "Idaho State Seed Lab Work Instruction – Compost Testing" draft information obtained in 2008 (ISSL, 2008). The procedures presented herein are intended to be general in nature and are applicable when referenced by a monitoring or sampling and analysis plan (SAP).

2.0 PROCEDURES

2.1 Amendment Sample Collection

Samples of amendment materials may be collected from a stockpile using a variety of methods and equipment. The goal is to collect a representative composite sample from the stockpiled material that has been identified for use as an amendment. A composite sample is comprised of a number of samples that are individually collected from differing locations, then combined (homogenized) into a single sample for subsequent analysis. The number of composite samples to be collected is dependent on the quantity and heterogeneity of the material. In the case of composted materials, the materials are generally mixed during the composting process and fairly homogenous. One composite sample, comprised of at least 30 sub-samples from each truck load for the stockpile, will be sampled.

Samples can be collected with a variety of implements, depending on the kind of material (e.g., gloved hand, stainless-steel trowel, plastic scoop, shovel, etc). For compost, a gloved hand or trowel can be used to collect the sample. For most materials, the sample can be collected into a gallon-size Ziploc bag, filling the bag at least ½ full. The sub-samples should all be collected into the same bag and then homogenized. To homogenize composite samples, seal the bag and mix the contents manually by hand kneading.

After homogenization, the composite sample will be double bagged, labeled, and placed in a cooler for storage and later shipping. Refer to SOP 5 (Sample Custody, Packaging, and Shipment) for instructions. The samples should be clearly labeled for the test desired (germination test) and possess a unique sample identification number.

Sampling equipment will be decontaminated after use at each of the sampling locations in accordance with SOP 13 (Equipment Decontamination). Sample information (including material type, description of sub-samples, and source of material) will be documented in the field logbook, including any changes in protocol.

2.2 Germination Test Methodology

The detailed steps to perform a compost germination test are outlined in ISSL (2008) and they are summarized here. It is assumed that similar methodology would be used, with slight modification if necessary, for other types of amendments.

Four large planter boxes will be prepared with approximately ½ to 1 inch of the compost sample spread in each box. The boxes will be labeled with the laboratory sample identification number and the date of planting will be recorded. The compost will be watered. Then, two of the boxes will be placed in a germinator at 15-25 ºC and two boxes will be placed in a germinator at 20-30 ºC. The boxes will remain in the germinators for 14 days. Following 14 days, the boxes will be removed from germinators. Careful visual examination will be performed for each box, noting the presence of small sprouts or grown seedlings. If there are no sprouted seeds, then the test will conclude: "No Viable Noxious Weed Seed or Common Weed Seed Present: None Found, 0.0000% germination in 20-30 Celsius or 15-25 Celsius alternating temperatures." If a viable seeding is found, then it will be identified and which temperature the seedling was found in will be recorded.

3.0 DECONTAMINATION

All equipment used in the sampling process shall be decontaminated prior to field use and between sample locations. Refer to SOP 13 (Equipment Decontamination) for specific instructions.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

There are no specific QA activities which apply to the implementation of these sampling procedures. However, the following QA/QC procedures apply:

- Duplicate, rinsate, and matrix spike samples will be collected at the frequencies documented in the field sampling plan.
- All sampling data must be documented in the field logbooks and/or field forms, including rational deviations from this SOP.
- The Field Team Leader or designated QA reviewer will check and verify that field documentation has been completed per this procedure and other procedures referenced herein.
- All equipment must be operated according to the manufacturer's specifications, including calibration and maintenance.

5.0 REFERENCES

Idaho State Seed Lab (ISSL). 2008. Idaho State Seed Lab Work Instruction – Compost Testing. Draft information in email from Choice Rawson, Technical Records Specialist, ISSL, Boise, ID. May 7, 2008.

J.R. SIMPLOT COMPANY – CONDA MINE

STANDARD OPERATING PROCEDURE No. 23

MATERIAL STOCKPILE SAMPLING

1.0 INTRODUCTION

This Standard Operating Procedure (SOP) is a general guidance document for material stockpile sampling. When this procedure is referenced by a monitoring or sampling and analysis plan, field personnel shall sample as described below. This SOP is not applicable for the collection of volatile organic compounds (VOCs), or samples where the analyte(s) may react with the sampling equipment. This SOP defines sample collection procedures using hand augers, shovels/trowels, and soil core samplers.

2.0 PROCEDURES

Samples may be collected using a variety of methods and equipment, as grab samples or as composite samples. The sample method is determined based on the physical characteristics of the material.

Grab sample: Grab samples are useful in determining discrete concentrations.

Composite sample: A number of sub-samples that are individually collected from differing locations then combined (homogenized) into a single sample for subsequent analysis.

3.0 EQUIPMENT AND TECHNIQUES

Stockpile samples shall be obtained using hand augers or shovels/trowels.

Hand Auger: A hand auger consists of a stainless steel tube with two sharpened spiral wings at the tip.

Shovel/Trowel: Various shovel/trowel designs and sizes are commercially available for a variety of sampling applications. These devices are hand-driven and are typically used for sampling relatively soft, unconsolidated materials. Shovels or trowels used for surface soil sampling shall be made of stainless steel.

Selection of a sampling device is most often contingent upon the physical characteristics of the medium to be sampled.

4.0 SAMPLE COLLECTION PRESERVATION, CONTAINERS, HANDLING AND STORAGE

Chemical preservation of soils for inorganic analysis is generally not needed. Cooling is usually sufficient, supplemented by analysis within the appropriate holding time.

Using the appropriate equipment, retrieve the material from each truckload. Collect at least 30 subsamples of equal volume into a stainless steel bowl and composite into one sample. Transfer the composited sample into a large, air-tight, re-sealable plastic bag and homogenize. To homogenize composite samples, seal the bag and mix the contents manually by hand kneading. Particle size reduction may take place during mixing. Prior to field homogenization, remove twigs, rocks, leaves and other undesirable debris if they are not considered part of the sample. Sample contents will be re-homogenized at the lab prior to sample analysis.

Document any changes in protocol in the field logbook.

5.0 DECONTAMINATION

All equipment used in the sampling process shall be decontaminated prior to use. Refer to SOP 13 (Equipment Decontamination) for specific instructions.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL

There are no specific QA activities which apply to the implementation of these sampling procedures. However, the following QA/QC procedures apply:

- Duplicate, rinsate, and matrix spike samples will be collected at the frequencies documented in the field sampling plan.
- All sampling data must be documented in the field logbooks and/or field forms, including rational deviations from this SOP.
- The Field Team Leader or designated QA reviewer will check and verify that field documentation has been completed per this procedure and other procedures referenced herein.
- All equipment must be operated according to the manufacturer's specifications, including calibration and maintenance.

7.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow the project specific health and safety procedures.

8.0 REFERENCES

U.S. EPA Region 9. Field Sampling Guidance Document #1205- Soil Sampling

APPENDIX C
Health and Safety Plan

Health and Safety Plan
Conda/Woodall Mountain Mine

J.R. Simplot Company

May 2012

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LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AMSL	Above Mean Sea Level
ACGIH	American Conference of Governmental Industrial Hygienists
AOC	Administrative Order on Consent
CDC	Center for Disease Control
CFR	Code of Federal Regulations
CPR	Cardio-pulmonary Resuscitation
EPA	Environmental Protection Agency
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
NIOSH	National Institute of Occupational Safety and Health
ODA	Overburden Disposal Area
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PNOR	Particulates Not Otherwise Regulated
PPE	Personal Protective Equipment
RI/FS	Remedial Investigation/Feasibility Study
RMSF	Rocky Mountain Spotted Fever
SHSO	Site Health and Safety Officer
TLV	Threshold Limit Value

1.0 INTRODUCTION

This Health and Safety Plan (HASP) establishes policies and procedures to protect workers from the potential hazards posed by field activities associated with the Remedial Investigation and Feasibility Study (RI/FS) in accordance with the January 2008 Administrative Order on Consent (AOC) at the Conda/Woodall Mountain Phosphate Mine (Conda Mine). The Conda Mine is located approximately 8 miles northeast of Soda Springs, in Caribou County, Idaho (Figure 1).

The HASP assigns personnel responsibilities, prescribes mandatory operating procedures, establishes personal protective equipment (PPE) requirements and describes actions to be taken during a site emergency. The HASP has been prepared to comply with the requirements of 29 CFR 1910.120 (b)(4), the requirements of the Environmental Protection Agency (EPA) Occupational Health and Safety Manual and EPA Interim Standard Operating Safety Guide will be followed.

The provisions of this plan are mandatory for all personnel assigned to the project, including all employees, subcontractors, and visitors. A copy of this plan will be made available to all personnel, contractors, subcontractors and authorized visitors that may enter work areas; said personnel will also sign the HASP review form (Section 8). This plan does not apply to the EPA or State of Idaho personnel or their on-site representatives.

Personnel working at the mine site must have received the Occupational Safety and Health Administration (OSHA) HAZWOPER training (29 CFR 1910.120(e)(3)) as applicable. HAZWOPER training certificates will be maintained on-site by the Site Health and Safety Officer (SHSO). Those personnel must be involved in the communication and understanding of potential chemical hazards through a Hazard Communication Program in accordance with the provisions of the OSHA Regulations 29 CFR 1910.1200.

The Conda Mine has its own health and safety requirements. Personnel must adhere to Conda Mine health and safety requirements at all times when working within the mine area.

This plan also provides for alternate procedures to address changing situations that may arise during field operations. This plan shall be present and readily available during all on-site activities. All personnel working on or visiting work areas shall be briefed on the HASP and adhere to all provisions of this plan. Any supplemental plans used by subcontractors shall conform to this HASP as a minimum.

Overall Hazard is: High: ________ Moderate: __________

Low: ___X_____ Unknown: _________

1.1 Site Description

The Conda Mine is located within the Western Phosphate Field, approximately 8 miles northeast of Soda Springs, in Caribou County, Idaho, on the east side of State Highway 34 (Figure 1). Historic mining activities at the Site targeted the phosphatic shale in the Meade Peak Member of the Phosphoria Formation for use in fertilizer production. Mining operations occurred at Conda from 1906 through 1984. From 1906 through 1956, mining was achieved through underground operations. In the early 1950s, Site operations transitioned from underground to open pit mining until underground mining ceased in 1956. The open-pit mining targeted the phosphatic shale along the strike of the Meade Peak Member's surface exposures. This approach necessitated removal of any overburden-rock units above the phosphatic shale, with disposal of these run-of-mine materials in pits, or overburden disposal areas (ODAs) external to the pits. The overburden-rock units generally consist of Rex Chert, Hanging Wall Mudstone, Hanging Wall Phosphatic Shale, Middle Waste Shale, and some Footwall[1] Mudstone. The pit floors consist of exposed Wells Formation and areas of residual Phosphoria Formation.

The Mudstone and Middle Waste Shale naturally contain elevated levels of selenium and other trace metals. Handling and disposal of the overburden accelerated both physical and chemical weathering processes, resulting in releases of selenium and other Chemicals of Potential Concern (COPC) to the environment. Numerous area-wide studies have identified Middle Waste Shale within the overburden as the predominant source of selenium and other COPC releases to the environment (Montgomery Watson 1999, Bond 2000, Herring et al. 2000, Munkers 2000).

At present, no active mining is occurring within the Site. Simplot currently operates a pump booster station at Conda, completed in 1984 as part of an 87-mile pipeline that transports raw phosphate ore from the Smoky Canyon Mine to the Don Plant in Pocatello, Idaho.

1.2 Scope of Work

Principal activities will include:

- Sampling of surface and subsurface soil, sediment, groundwater, surface water, and vegetation to evaluate whether these media pose a risk to ecological receptors;

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[1] Hanging wall and foot wall are mining terms. Hanging wall describes the fault block towards which an inclined fault dips (i.e., overhead block in a tunnel advanced along an inclined fault). Foot wall describes the block from which an inclined fault dips (i.e., under foot block in a tunnel advanced along an inclined fault).

- Drilling and installation of monitoring wells;
- In-stream flow measurements;
- Collection of fish, benthic macroinvertebrate, terrestrial invertebrate and small mammal tissue samples; and
- Performance of other Site-related studies (e.g., geotechnical and geophysical studies, pilot studies).

1.3 Plan Revisions

The procedures presented herein are intended to serve as guidelines. They are not a substitute for the sound judgment of on-site personnel. Work conditions may change as the project progresses. As appropriate, addenda to the plan will be provided by the SHSO. Prompt notification of changing work conditions requiring possible modification of this plan is the responsibility of the SHSO. Additional field tasks with unique hazards or risks may also require addenda to this plan. In addition, procedures and equipment specified in this plan will be reviewed and updated as new technologies and equipment are developed. In any event, no changes to this plan will be implemented without prior approval of the Project Coordinator.

Attachment A of this plan will be reserved for plan addenda. The addenda will be identified by letter and will refer to the latest current revision of the plan (e.g., the first addendum to this plan will be Addendum 1A). Each person with a copy of this plan will be provided with each addendum. A list of those persons who have a copy of this plan will be kept by the SHSO.

2.0 TEAM ORGANIZATION AND HEALTH AND SAFETY RESPONSIBILITIES

The work will be performed by Formation Environmental personnel or a contractor under the direct supervision of Formation Environmental personnel who will act as the on-site representative for Simplot. The following personnel are designated to carry out the stated job functions on the site.

Table 1 – Personnel Organization

Personnel	Name	Affiliation	Phone
Project Coordinator:	Robbert-Paul Smit	Formation Environmental	303-442-0267
Project Coordinator:	Kim Gower	J.R. Simplot Company	208-235-5606
Site Health and Safety Officer:	To Be Determined	---	---
Sampling Program Manager:	Robbert-Paul Smit	Formation Environmental	303-442-0267
Contractor Site Manager:	To Be Determined	---	---

2.1 Responsibility of Personnel

Responsibilities of all project personnel are provided below.

2.1.1 Project Coordinator Responsibilities

The Project Coordinator is the individual who shall be responsible for all actions performed at the site. The Project Coordinator will have the responsibility for oversight of implementation of this plan during field operations. Specific responsibilities include:

- Providing technical input for pre-entry briefing and tailgate safety meetings with field personnel;
- Liaising with the SHSO to ensure that health and safety requirements are met;
- Correcting work practices or conditions that may result in accidents, injuries, or chemical exposure to site personnel; and
- Approving this plan, as well as any updates or changes.

2.1.2 Site Health and Safety Officer Responsibilities

The SHSO will be designated as the on-site Supervising Contractor individual responsible for all health and safety activities. The SHSO will report directly to the Project Coordinator on a daily basis, when field activities are occurring. Specific responsibilities include:

- Participating in the preparation of and implementation of this HASP;
- Conducting initial briefings for personnel beginning work at the site. Personnel will supply copies of all training, medical surveillance, and fit testing documentation. Such documentation will be reviewed and maintained by the SHSO;
- Conducting daily tailgate safety meetings (meetings will be documented [attendees and safety issues discussed] and documentation maintained on-Site). An example documentation form is provided as Attachment B.;
- Informing personnel involved in the field operations of the proper procedures during emergencies;
- Ensuring that personnel involved in this project are aware of the provisions of this HASP;
- Informing and reminding personnel of the potential hazards associated with this project;
- Ensuring that field personnel receive site-specific training the first day on-site;
- Selecting appropriate protective clothing and equipment;
- Monitoring on-site intrusive operations and conditions;
- Immediately reporting any unusual or unsafe conditions to the Project Coordinator;
- Coordinating emergency procedures, evacuation routes, and calling the appropriate emergency contacts; and
- Approving this plan and making any updates or changes based on experience at the site or new data gathered.

2.1.3 Sampling Program Manager Responsibilities

The Sampling Program Manager will have responsibility for supervising the sampling program. Specific responsibilities include:

- Providing sampling training;
- Ensuring that sampling personnel receive training the first day on-site;
- Ensuring that sampling personnel are aware of the provisions of this HASP;
- Verifying that sampling personnel use appropriate PPE; and

- Reporting any unusual or unsafe conditions to the SHSO.

2.1.4 Project Staff Responsibilities

Specific responsibilities for all field personnel involved with the project include:

- Complying with the plan;
- Administering necessary precautions to minimize injury or chemical exposure to themselves or other personnel; and
- Notifying the SHSO or Site Manager of unsafe or potentially unsafe conditions, as well as of any accidents or injuries.

2.2 Contractors

Formation Environmental subcontractors and third party contractors shall bear the ultimate responsibility for all matters dealing with safety in the performance of their work. This responsibility includes the safety of all persons and property and any and all employees of subcontractors that may perform work on their behalf. This requirement will apply continuously regardless of time or place, and will in no way be altered because Formation Environmental personnel provide general directions as to the location where work should be performed. Third party contractors, their employees and any and all employees of subcontractors that may perform work on their behalf may be required to work with potentially hazardous substances. The Site Manager/SHSO will, to the best of their ability, inform subcontractors or their representatives of any potential fire, explosion, health, or other safety hazards that have been identified during operations. A copy of this HASP shall be made available to all contractors performing work at the Site. Contractors are also expected to adhere to their own health and safety protocols.

3.0 HAZARD EVALUATION

3.1 Site Hazards

The major goal of the procedures defined in this HASP is to protect the workers from physical and chemical hazards that may be encountered during implementation of the work. Potential hazards are summarized in Table 2 and described in detail in the following subsections.

The site may have concentrations of selenium, cadmium, chromium, nickel, zinc and uranium in soils and water above action levels.

Table 2 – List of Activities with their Respective Hazards and Mitigation Measures

Activity	Hazard	Mitigation
Soil, Sediment, Vegetation and Biota Sampling	Dermal contact with selenium and other potentially hazardous soil contaminants, with a potential for ingestion	Use of gloves and appropriate eye protection
	Release of dust containing contaminants, leading to respiratory contact	Minimize activities that generate dust. Respiratory protection and dust suppression using water, as needed.
	General safety hazards	Comply with OSHA guidelines
	Cold and Heat Stress	See Sections 3.1.1.2 and 3.1.1.3, respectively
	Native wildlife, such as rodents, ticks, snakes, and bears, present the possibility of bites and associated diseases	Wear permethrin treated clothing in tick infested areas, at least 20% DEET insect repellent on exposed skin and avoid wildlife when possible. In case of an animal bite, perform first aid and seek medical attention.
Water Sampling	Dermal contact with selenium and other potentially hazardous water contaminants, with a potential for ingestion.	Use of latex or similar gloves and appropriate eye ware.
	Splashing of water with a potential of ingestion	Minimize activities that could result in causing backsplash.
	Sample preservatives	Exercise caution when opening or handling containers containing acid (hydrochloric, nitric, sulfuric) preservatives. Do not allow sample containers with acid sit in the sun. Warmed acids may fume when the containers are opened causing irritation to the eyes nose, and throat.

Activity	Hazard	Mitigation
Drilling and Construction Activities	Physical hazards from heavy equipment	Wear PPE such as steel-toed boots, safety glasses or goggles and hard hats.
	Contact with buried utilities	Contact local utilities company for location/information on buried utilities
	Overhead utilities	Utilize safe operating practices. Maintain minimum clearances.
	Dermal contact with hazardous materials	Use gloves and respiratory protection as needed
	Release of dust containing contaminants, leading to respiratory contact	Minimize activities that generate dust. Respiratory protection and dust suppression using water as needed.
	Noise from heavy equipment	Use hearing protection as needed.
	Native wildlife, such as rodents, ticks, snakes, and bears, present the possibility of bites and associated diseases	Wear permethrin treated clothing in tick infested areas, at least 20% DDT insect repellent on exposed skin and avoid wildlife and domesticated animals when possible. In case of an animal bite, perform first aid and seek medical attention.
	Cold and Heat Stress	See Sections 3.1.1.2 and 3.1.1.3, respectively.
	High traffic areas	Set up signs, signals, or barricades as necessary to provide worker protection and maintain appropriate traffic flow. Flagmen, or other appropriate traffic controls may be necessary in very high traffic areas.

3.1.1 Physical Hazards

Physical hazards associated with sampling, drilling and other field activities pose a greater potential for injury at the site than chemical exposure. Physical hazards can be posed by:

- Heavy Equipment;
- Cold Stress/Heat Stress;
- Noise;
- Manual Lifting;
- Slip, Trip and Fall;
- Overhead Utilities; and
- Underground Utilities.

Injuries that may result from these physical hazards can range from simple slip-trip-fall types of accidents to casualties, including fatalities due to moving and/or rotating heavy equipment or electrocution. Injuries resulting from physical hazards can be avoided through the adoption of safe work practices and employing caution when working with machinery.

All field personnel shall be conscious of their work environment and must notify the Site Manager or SHSO or other appropriate supervisory personnel of any unsafe conditions. All field personnel should also familiarize themselves with other contractors' safety procedures.

3.1.1.1 Heavy Equipment

Operation of heavy equipment in excavation/earthmoving/drilling activities presents potential physical hazards to personnel. PPE such as steel-toed boots, safety glasses or goggles, and hard hats shall be worn whenever such equipment is present. Personnel should at all times be aware of the location and operation of heavy equipment, and take precautions to avoid getting in the way of their operation. An audible backup alarm is mandatory on all heavy equipment working on site. High visibility vests may be appropriate in open areas subject to heavy equipment traffic.

3.1.1.2 Cold Stress

Personnel working outdoors in low temperatures, especially at or below 40° Fahrenheit (F), wet conditions, wind speed 5 miles per hour or higher, lack of water, previous cold injuries, use of tobacco, fatigue and low activity are subject to cold stress. Exposure to extreme cold for a short time causes severe injury to the surface of the body. Areas of the body which have high surface area-to-volume ratio such as fingers, toes, feet and ears are the most susceptible.

Two factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. A wind chill chart is shown in Attachment C.

Frostbite

Local injury resulting from cold is included in the generic term frostbite. Frostbite of the extremities can be categorized as:

- "Frost nip or incipient frostbite" which is characterized by sudden whitening of skin;
- "Superficial frostbite" which is characterized by skin with a waxy or white appearance and is firm to the touch, but tissue beneath is resilient; and
- "Deep frostbite" which is characterized by tissues that is cold, pale, and solid.

Hypothermia

Hypothermia is most likely at very cold temperatures but it can occur even at cool temperatures if an individual becomes chilled from rain or sweat. Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. Its symptoms are usually exhibited in five stages:

- Shivering, exhaustion;
- Apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95° F;
- Unconsciousness, glassy stare, slow pulse, and respiratory rate;
- Freezing of the extremities; and
- Death.

Field activities shall be terminated by the SHSO if initial signs of frostbite or hypothermia exist or if equivalent wind chill temperature is below 0° F. All affected personnel shall be kept warm and receive immediate medical care.

Additional notes to remember:

- Do not rub the frostbitten part;
- Do not use ice, snow, gasoline or anything cold on the frostbitten area;
- Do not use heat lamps or hot water bottles to rewarm the part; and
- Give a warm drink - not coffee, tea, or alcohol.

3.1.1.3 Heat Stress

When personnel are working in hot environments, the Site Manager and all field personnel should be trained to recognize the symptoms of heat stress and provide initial first aid treatment if required until more qualified personnel take over. Heat stress occurs when the rate of heat gain is greater than the body's ability to remove it. It is important to understand the factors that cause overheating and mechanisms to control those factors.

Heating of the body occurs from three sources:

- Radiant heating from heat sources or sunlight;
- Convective heating from contact with a warmer object or liquid; and

- Metabolic heating caused by activity.

Cooling occurs through three mechanisms:

- Respiration: Exhaled air is warm. As the body overheats, respiration becomes more rapid;
- Radiation: Heat is released at the surface of the skin. As the body overheats, the surficial blood vessels dilate and allow more heat to be lost; and
- Evaporation: Perspiration is released to the skin surface and evaporates. The skin is cooled by evaporative cooling.

Employee Education

The heat stress education poster is shown in Attachment D and will be posted at the work site and reviewed during safety meetings.

Table 3 – Heat Stress Symptoms and Treatment

Condition	Common Symptoms	Treatment
Slightly elevated body temperature	Body temperature between 99 and 101° F Headache	Drink cool fluids. Rest in cool place until temperature and pulse are below 99° F and 110° F, respectively.
Heat rash	Rash mainly on back	Shower at the end of the shift. Observe for signs of heat exhaustion.
Heat cramps	Muscle cramps or twitching often starting in abdominal area. Pain in hands, feet and abdominal areas.	Remove from field work. Take off PPE. Encourage consumption of cool fluids designed to replenish electrolytes (e.g., Gatorade). Observe for signs of heat exhaustion.
Heat exhaustion	Body temperature between 99 and 102° F Headache, weakness Elevated pulse Profuse sweating Pale skin Cool wet/clammy skin Lethargic Nausea Dizziness	Act immediately. Remove to a cool shaded area. Take off PPE. Drink cool fluids, about a cup every 15 minutes unless sick to the stomach. Spray with a cool mist of water or apply wet cloth to skin. Treat as a medical emergency if the person does not feel better in a few minutes. No field work for at least 48 hours.
Heat stroke **LIFE THREATENING**	Temperature greater than 102° F Hot, dry pale skin with no sweating Flushed skin Irritability, confusion, seizures, unconsciousness. Rapid pulse	Treat as a medical emergency. Remove from field work. Remove PPE. Spray with a cool water mist, or apply cool wet cloth to skin, not cold water. Place ice packs under armpits and groin area until emergency medical services arrive. Written release from doctor required to return to work.

Effects of PPE

Heat stress may occur with or without the use of PPE. PPE adds layers of clothing that insulate the wearer from cooling air. Chemical protective clothing generally has a vapor barrier to keep out chemical vapors. The vapor barrier also prevents evaporative cooling of perspiration. In short, PPE increases the heat stress on workers.

Practical Methods to Reduce Heat Stress

These methods will be discussed during safety meetings:

- Become acclimated to heat for several days whenever possible. Plan work in the cooler portions of the day. Early morning hours and evening hours are cooler.
- Perform Site preparations before the field team dresses out. Instrument calibrations, equipment preparation, and planning for the work day, etc., should be performed before dressing in PPE.
- Take frequent breaks and consume at least one pint of cool fluid every hour. Replenish electrolytes through the consumption of diluted drinks. The body loses more water than electrolytes. Concentrated salt, electrolyte, or juices can increase susceptibility to heat stress.
- Avoid beverages with caffeine, which make the body lose water and increase risk for heat illnesses.

Occupational Exposure Standards

The EPA and the American Conference of Governmental Industrial Hygienists (ACGIH) have published heat stress monitoring recommendations. The EPA recommends heat-stress monitoring at temperatures above 70° F when chemical PPE is used.

The tabulated information assumes that no chemical PPE is being worn. Since chemical PPE tends to increase heat stress, ACGIH has published correction factors in the same standard. OSHA enforces the ACGIH recommendation.

Noise

Personnel working around large construction equipment and loud, congested areas can be exposed to excessive noise causing temporary or permanent damage to hearing. The effects of noise can include:

- workers being startled, annoyed, or distracted;
- physical damage to the ear; and

- communication impediment that may increase potential hazards.

All personnel shall wear hearing-protective devices (i.e., either ear plugs or muffs) when noise levels interfere with normal speech. Hand signals will be established by on-site personnel, as appropriate, to facilitate communications while involved in high-noise activities.

3.1.1.4 Manual Lifting

Activities may require personnel to move large, heavy objects by hand. The human body is subject to severe damage in the forms of back injury and hernia if caution is not observed when handling, lifting, or moving large heavy objects.

General Rules

- Get a good footing;
- Place feet about one shoulder width apart;
- Bend at knees to grasp weight;
- Keep the back straight; and
- Get a good hold.

3.1.1.5 Slip, Trip and Fall

Protection from slip, trip and fall hazards will be provided through standard safety procedures including good housekeeping. Removing equipment and debris, and taking general precautions during site operations will be standard operating procedures. Workers will be apprised of any potential physical hazards through regularly scheduled health and safety meetings. Whenever possible, trip and fall hazards will be eliminated or clearly identified with yellow "caution" tape. Impalement hazards will be neutralized as soon as they are identified.

3.1.1.6 Overhead Utilities

Before equipment setup and activities begin, all overhead utilities will be identified by all members of the crew. The owner/operator of equipment will be responsible for operation of equipment in a safe manner and follow the relevant regulations of 29 CFR 1926.952(c). These regulations require all operating equipment maintain minimum safe operating distances from overhead power transmission lines as given in 29 CFR 1926.950 (Table 4).

Table 4 – Minimum Safe Working Distances (Alternating Current)

Voltage Range (phase to phase) *(kilovolt)*	Minimum Working and Clear Hot Stick Distance *(Stick Distance)*
2.1 to 15	2 feet 0 inches
15.1 to 35	2 feet 4 inches
35.1 to 46	2 feet 6 inches
46.1 to 72.5	3 feet 0 inches
72.6 to 121	3 feet 4 inches
138 to 145	3 feet 6 inches
161 to 169	3 feet 8 inches
230 to 242	5 feet 0 inches
345 to 363	7 feet 0 inches[1]
500 to 552	11 feet 0 inches[1]
700 to 765	15 feet 0 inches[1]

[1] For 345-362 kv., 500-552 kv., and 700-765 kv., minimum clear hot stick distance may be reduced provided that such distances are not less than the shortest distance between the energized part and the grounded surface.

Whenever equipment is working near active overhead transmission lines a worker not located in or on the operating equipment is required to provide confirmation that the minimum safe distances are being observed.

3.1.1.7 Underground Utilities

All excavations, including drilling, must comply with 29 CFR 1926.956(b) and 29 CFR 1926.651(b). These regulations include, but are not limited to:

- Before drilling or excavation activities begin, all utilities (i.e., electricity, natural gas lines, water lines, sewer lines, etc.) should be identified and located by the local utilities companies.
- The utilities companies should be notified within a reasonable amount of time before excavation activities are to take place to allow enough time for all utilities present to be located.
- When excavation operations approach the underground utilities, the exact location of the utilities will be found in a safe manner.

The construction contractor is responsible for compliance with these regulations.

3.1.2 Chemical Exposures

The effects of exposure depend on the chemical, its concentration, route of entry, and duration of exposure. Health effects may also be influenced by personal factors such as the individual's alcohol consumption, smoking habits, medical use, fitness and nutrition, age, and gender.

The following substances are of primary health concern due to their toxicity and concentrations on the Site. There are two categories of chemical hazards associated with Site activities:

- Site-related constituents (selenium, cadmium, chromium, nickel, zinc and uranium); and
- Chemicals used to conduct site work (e.g., gasoline).

These are discussed in the following subsections.

3.1.2.1 Site Constituents

Simplot's experience at the Smoky Canyon Mine has shown that selenium serves as an indicator constituent for the remaining site-related constituents. A comparison of locations at the Conda Mine where action levels are exceeded indicates that selenium also has the widest distribution and greatest order-of-magnitude of concentrations exceeding action levels. As a result, selenium is the limiting constituent with respect to exposure to site constituents. Selenium is present at the site at elevated concentrations in soils. Acute selenium exposure usually occurs through inhalation of dust or fumes.

Selenium Exposure Limits and Health Effects

Permissible Exposure Limit (PEL) – 0.2 mg/m^3 (8 hour workday)

The PEL is the maximum average time weighted concentration of a substance that a worker can be exposed to over a workday.

Action Level – 0.1 mg/m^3 (8 hour workday)

OSHA does not at this time have a specific action level for selenium. Thus the action level is half the PEL. The action level is a time weighted average that indicates the level at which medical surveillance or increased industrial hygiene monitoring is required for a given substance.

Threshold limit value (TLV) – 0.2 mg/m^3

The TLV is a time-weighted average concentration for a normal 8-hour workday or 40-hour workweek to which nearly all workers may be repeatedly exposed.

Exposure to selenium in dust can result in dizziness, fatigue, and irritation of mucous membranes. In extreme cases collection of fluid in the lungs (pulmonary edema) and severe bronchitis have been reported. Personal protective measures, including respiratory and personal hygiene will be covered during site health and safety briefings. Additional information on health effects from exposure to selenium, cadmium, chromium, nickel, zinc and uranium is provided in Attachment E.

3.1.2.2 Hazard Communication Chemicals

Gasoline, motor oil, and other products will be brought onto the site by project staff. These hazardous materials will be managed under each company's Hazard Communication Program. An inventory of all hazardous materials brought onto the site, along with a copy of all Material Safety Data Sheets, will be available on site at the project trailer or office.

3.1.3 Biological Hazards

3.1.3.1 Insect Bites and Stings

Insects are present at this site. Although insect bites or stings can be painful, they rarely cause death. However, some people can have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and or as often as needed throughout the work shift.
- Wear proper protective clothing (work boots, sock and light colored pants).
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
- Field personnel who may have insect allergies should provide this information to the SHSO prior to commencing work.

3.1.3.2 Tick Bites

The Center for Disease Control (CDC) has noted the increase in Lyme Disease and Rocky Mountain Spotted Fever (RMSF) resulting from bites from infected ticks that live in and near wooded areas, tall grass, and brush. Ticks are small, ranging in size up to about one quarter inch. They are sometimes difficult to see. The tick season extends from spring through summer. When embedded in the skin, they may look like a freckle. Lyme disease has occurred in 43 states, with the heaviest concentrations in the Northeast (Connecticut, Massachusetts, New Jersey, New York, Pennsylvania), the upper Midwest (Minnesota and Wisconsin), and along the northern California coast. It is caused by deer ticks and lone star ticks which have become infected with spirochetes. Deer ticks may range in size from one-eighth inch in size to up to one-quarter inch in size and can be black or brick red in color. Lone star ticks are larger and chestnut brown in color.

RMSF has occurred in 36 states, with the heaviest concentrations in Oklahoma, North Carolina, South Carolina, and Virginia. It is caused by Rocky Mountain wood ticks, and dog ticks which have become infected with rickettsia. Both types of ticks are black in color.

Standard field gear (work boots, socks and light colored coveralls) provides good protection against tick bites, particularly if the joints are taped. However, even when wearing field gear, the following precautions should be taken when working in areas that might be infested with ticks:

- When in the field, check yourself often for ticks, particularly on your lower legs and areas covered with hair. Look for “a freckle that moves.”
- Spray outer clothing, particularly your pant legs and socks, BUT NOT YOUR SKIN, with an insect repellent.
- When walking in wooded areas, avoid contact with bushes, tall grass, or brush as much as possible.
- If you suspect that a tick is present, remove it with tweezers only, and not with matches or a lit cigarette. Grasp the tick with the tweezers and pull gently. If it resists, cover the tick with salad oil for about 15 minutes to asphyxiate it, then remove it with tweezers. Do not use nail polish or any other type of chemical. Be sure and remove all parts of the tick’s body. Once removed, disinfect the area with alcohol, or a similar antiseptic.
- Look for signs of the onset of Lyme disease, such as a rash that looks like a bulls-eye or an expanding red circle surrounding a light area on the skin, frequently with a small welt in the center. This rash can appear from several days to several weeks after the tick bite.
- Also look for signs of the onset of RMSF, an inflammation or rash comprising many red spots under the skin, which appear 3 to 10 days after the tick bite. The rash frequently occurs on the ankles and wrists.

The first symptoms of either disease are flu-like chills, headache, dizziness, fatigue, stiff neck, and bone pain. If immediately treated by a physician, most individual recover fully in a short period of time. If not treated, more serious symptoms can occur.

If you believe you have been bitten by a tick, or if any of the signs and symptoms noted above appear contact the SHSO. The SHSO has the authority to authorize a physician visit for an examination and possible treatment.

3.1.3.3 Snake Bites

There are venomous snakes in Caribou County, Idaho. If bitten by a snake, remain calm, keep the affected area below the level of the heart and walk, do not run, to the nearest aid station for assistance. The SHSO will designate someone to immediately transport the victim to the closest medical facility for treatment or send for appropriate medical assistance, whichever is faster. The following precautions should be used when working in areas with snakes:

- Wear appropriate protective equipment (work boots, snake chaps);
- Be alert and aware of surroundings; and
- Avoid walking through bushes, tall grass or brush as much as possible.

3.1.3.4 Wild Animals

Site activities will take place in remote areas. Personnel will use the buddy system when working in remote areas.

3.1.3.5 Plants

The potential for contact with poisonous plants exists when performing fieldwork in Idaho. Reactions to poisonous plant exposure vary depending on the individual and the severity of the exposure, and can range from minor skin irritation to severe allergic reactions (oozing rashes and swelling) that require medical attention. Skin protection such as Ivy Block is available in the field kit.

3.2 Training Requirements

All personnel performing sampling or activities associated with contaminated soil shall have received training in accordance with OSHA 29 CFR 1910.120(e) (3) or have gained experience equivalent to this training and documented in their respective company's files. Specifically, the training will include 40 hours of initial course instruction plus three days of actual field experience. The 40 hours of instruction will cover, at a minimum, the following items:

- hazard types;
- basic industrial hygiene;

- basic toxicology;
- worker rights and responsibilities under 29 CFR;
- environmental monitoring equipment;
- hazard evaluation;
- safe work practices;
- site safety plans;
- PPE;
- Decontamination;
- emergency response;
- contingency plans; and
- engineering controls.

All site personnel are responsible for completing and annual eight-hour OSHA refresher course. The SHSO will verify appropriate training for all project staff. Other specific OSHA training requirements may apply to specific tasks or additional tasks that occur as part of this project, such as confined space training. The SHSO will determine these training needs as the project develops.

3.3 Medical Surveillance

Soil sampling and drilling personnel will participate in a medical surveillance program as required by OSHA 29 CFR 1910.120(f). Due to the possible hazards presented at the site, medical monitoring will be performed for all applicable personnel prior to initiation of field investigation activities.

A comprehensive medical surveillance program including all provisions defined in 29 CFR 1910.1025 will be implemented for all employees who are or may be exposed above the action level for more than 30 days per year. All medical surveillance conditions required by 29 CFR 1910.1025 will be followed. Similar site-specific monitoring will be required for subcontractor personnel involved in intrusive investigation activities. Medical monitoring records will be maintained by the Supervising Contractor's Director of Human Resources. The SHSO will verify that personnel, as applicable, have received appropriate medical surveillance clearance prior to accessing the site work areas.

Workers required to wear respirators will receive training and respirator fit-testing in accordance with the OSHA Regulation 29 CFR 1910.134. The medical evaluation will have categorized employees as fit-for-duty and able to wear respiratory protection. It is the responsibility of each employee to maintain proper medical documentation. The SHSO will maintain respirator fit-testing results on-site. Records will be maintained by the Director of Human Resources as well.

4.0 PERSONAL PROTECTIVE EQUIPMENT

The following are general safety procedures which will be implemented at the site:

1. Foam, carbon dioxide, or dry-chemical fire extinguishers shall be provided on all heavy equipment and shall conform to the applicable requirements of 29 CFR 1926.

2. Electrical equipment and wiring on heavy equipment shall confirm to applicable requirements of Chapter 5 of the National Electric Code, 29 CFR, and 49 CFR.

3. Soil excavation, handling and transportation will be performed in a manner to minimize dust generation. Personnel shall not work in the area immediately downwind of any activities that generate visible dust.

4. Employees shall be issued and utilize appropriate health and safety equipment as determined by the SHSO. Except in emergency cases, the Engineer shall be advised by the SHSO of changes in the degree of PPE prior to implementation.

5. PPE requirements shall be determined by personal air monitoring.

Based on an evaluation of the potential hazards, the initial level of PPE for Sampling personnel and the Supervising Contractor will be:

- Sturdy hiking boots or steel toe work boots (conforming to ANSI Standard Z 41.1);
- Full length pants;
- Shirts with minimum 4-inch long sleeves;
- Hard hat, will be worn when around operating equipment (conforming to ANSI Standard Z 89.1);
- Leather/cotton gloves or Neoprene®/Nitrile® chemical resistant outer gloves (optional);
- Disposable Nitrile® inner gloves (while sampling or handling soil);
- Safety glasses (conforming to ANSI Standard Z 87.1)
- Hearing protection (when excessive noise greater than 85 dBa is present); and
- High visibility safety vest (if near vehicular traffic).

Based on prior field sampling activities at the site, the initial level of PPE defined for the intrusive activities on the project will be basic. For the activities that occur in and around drilling operations, Level D protection will be maintained on appropriate personnel.

Table 5 – Levels of Protection

Activity	Levels Of PPE	
	Initial	Contingency
Surface water, Sediment, Soil, Vegetation and Biota Investigations	Basic	-
Drilling and Construction Activities	D	Mod-D

Table 6 – PPE for Levels of Protection

Basic	Level D	Level Mod-D
Sturdy shoes/boots Full length pants Shirt with 4" sleeves Leather/Cotton gloves or Neoprene®/Nitrile® chemical resistant outer gloves (optional) Nitrile® inner gloves, while sampling Safety glasses, conforming to ANSI Standard Z 87.1, Ear plugs/muffs, if necessary High Visibility Safety vest, if near vehicular traffic	Steel toe work boots, conforming to ANSI Standard Z 41.1 Coveralls Leather/Cotton Gloves or Neoprene®/Nitrile® chemical resistant outer gloves Nitrile® inner gloves Safety glasses conforming to ANSI Standard Z 87.1 Ear plugs/muffs, if necessary Hard hat conforming to ANSI Standard Z 98.1 High Visibility Safety vest	Steel toe work boots, conforming to ANSI Standard Z 41.1 Coveralls Half-face or full-face air-purifying respirator equipped with appropriate cartridges Leather/Cotton Gloves or Neoprene®/Nitrile® chemical resistant outer gloves Nitrile® inner gloves Safety glasses conforming to ANSI Standard Z 87.1 Hard hat conforming to ANSI Standard Z 98.1 Ear plugs/muffs, if necessary High Visibility Safety vest

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE UNLESS APPROVED BY THE SHSO.

5.0 AIR MONITORING PROGRAM

There will be no air monitoring conducted during field sampling activities or drilling activities. Strict dust control and other engineering methods will be implemented to minimize worker exposure.

6.0 DECONTAMINATION PROCEDURES

Disposable PPE will be disposed of in an appropriate trash receptacle. Reusable PPE should be cleaned per the manufacturer's recommendations. Equipment should be cleaned of gross amounts of soil by brush or scraper before leaving the site. In addition, hands will be washed before lunch and after each work day.

Emergency decontamination procedures will include the following: decontaminate personnel and equipment using soap and water as much as possible prior to administering first aid procedures or transporting the victim to medical facility.

The following decontamination equipment is required:

- soap and water solution; and
- brushes.

7.0 EMERGENCY RESPONSE PLAN

7.1 Guidelines for Pre-Emergency Planning and Training

Employees must read this plan and familiarize themselves with the information in this chapter. Employees will be required to have a copy of this plan and a list of the emergency contacts and phone numbers immediately accessible on site and to know the route to the nearest qualified emergency medical services.

7.2 Emergency Recognition

Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse health effects or symptoms of exposure while working on site.
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

In the event that any member of the work crew experiences any adverse health effects or symptoms of exposure while on the scene, the entire crew working in that area will immediately halt work and act according to the instructions provided by the SHSO or Site Manager.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated will result in the evacuation of the work crew and re-evaluation of the hazard and the level of protection required.

7.3 Emergency Contacts

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations, contact the appropriate emergency contacts immediately and then telephone or radio the Site Manager or SHSO emergency personnel who will then coordinate response.

Table 7 – Emergency Contacts

Emergency Contacts		Phone Number
Fire Department and Ambulance		911
Caribou Memorial Hospital, 300 S 3rd West, Soda Springs, ID		208 574-0701
Poison Control	24 hour information	1-800-366-8888
U.S Environmental Protection Agency National Response Center	For spill reporting	1-800-424-8802
Formation Environmental Project Coordinator, Robbert-Paul Smit		303-442-0267
J.R Simplot Company Project Coordinator, Kim Gower		208-235-5606
Idaho DEQ, Project Manager, Margaretha English		208-373-0271
EPA Region 10, Project Manager, Fran Allans		208-378-5775

Medical Emergency	Hospital	Phone Number
Ambulance	Caribou Memorial Hospital	911

Nearest Hospitals

The nearest hospital is the Caribou Memorial Hospital located in Soda Springs, Idaho approximately 9 miles south of Conda along ID-34 (Figure 2).

The driving directions to the Caribou Memorial Hospital are:

- Proceed north on Conda Road;
- Turn left on to ID-34 heading south;
- Turn left at 3rd Street;
- Turn right at 2nd Street; and
- Turn left at 3rd west.

7.4 Personnel Roles, Lines of Authority , and Communication Procedures Durin g Emergency

In the event of a hazardous material emergency situation at any work area, the SHSO or the Site Manager will assume control and will be responsible for decision making. These individuals have the authority to resolve disputes about health and safety requirements and precautions.

They will also be responsible for coordinating all activities until emergency response teams (ambulance, fire department) arrive at the site.

The Site Manager will ensure that the necessary personnel and agencies are contacted as soon as possible after the emergency occurs.

All on-site personnel must know the location of the nearest phone and the location of the emergency phone number list.

7.5 Evacuation Routes and Procedures, Safe Distances, and Places of Refuge

In the event of hazardous material emergency conditions, employees will evacuate the area, transport injured personnel, or take other measures to safely remedy the situation. Evacuation routes and safe distances will be determined by the SHSO and the field team prior to initiating work.

7.6 Accident Prevention

All site activities present a degree of risk to on-Site personnel. During routine operations, risk is minimized by establishing good work practices, staying alert, and using proper PPE. Unpredictable events such as physical injury, chemical exposure, or fire may occur and must be anticipated. All employees are encouraged to participate in Red Cross first aid and cardio-pulmonary resuscitation (CPR) courses in order to more effectively handle physical and medical emergencies that may arise in the field.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated will result in the evacuation of the work crew from the work area and re-evaluation of the hazard and the level of protection required.

7.7 Emergency Site Security and Control

For this project, the SHSO (or designated representative) must know who is performing activities associated with the work on site and who is in the work area. Personnel access into the work area must be controlled. In an emergency situation, only necessary rescue and response personnel should be allowed into the designated area.

7.8 Procedures for Emergency Medical Treatment and First Aid

7.8.1 Personal Injury

In the event of personal injury: Workers will be trained in first aid and CPR either through or equivalent to American Red Cross standards. These individuals will be on-site to administer treatment to an injured worker. A first aid kit will be readily available which meets OSHA 1910.151, Appendix A. The victim should be transported to the nearest qualified hospital or medical center. If necessary, an ambulance should be called to transport the victim. A site wide medical emergency plan will be developed during initial project meetings. The SHSO is responsible for the completion of an Accident Report Form included as Attachment F to this plan.

7.8.2 Fire or Explosion

In the event of fire or explosion, personnel will evacuate the area immediately. Administer necessary first aid to injured employees. Personnel will proceed to a safe area and phone the local fire department. Upon contacting the fire department, state your name, nature of the hazard (fire, high combustible vapor levels), the location of the incident, and whether there were any physical injuries requiring an ambulance.

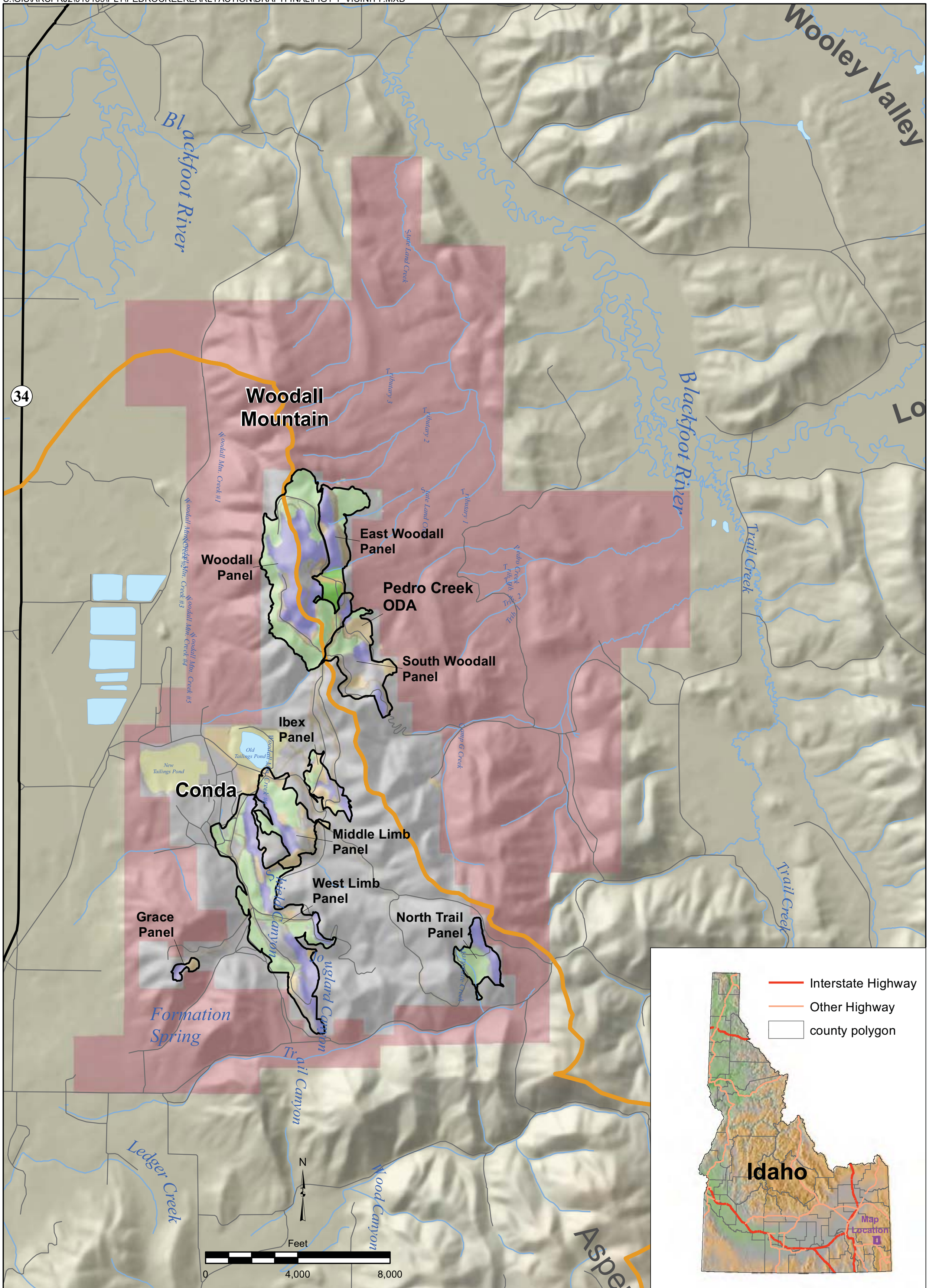
8.0 RECORD OF HEALTH AND SAFETY PLAN REVIEW

The undersigned have reviewed the contents of the HASP for sampling at the Conda/Woodall Mountain Mine Site. They understand the means and objectives of the sampling work and have been fully apprised of the risks and hazards involved in accomplishing the work. They further agree to comply with the requirements and protocols set forth in this document.

NAME	SIGNATURE	DATE

FIGURES

S:\GIS\ARCPRJ2\010139\PLT\PEDROCREEKEARLYACTION\DRAFTFINAL\FIG1-1_VICINITY.MXD



Legend

- Mine Panels
- BLackfoot / Bear River Drainage Divide
- Primary Road
- Secondary Road
- Water Body
- NHDFlowline
- Reclaimed Overburden Disposal Area
- Reclaimed Pit
- Reclaimed Road
- Disturbed Overburden Disposal Area
- Disturbed Pit
- Disturbed Road
- Disturbed Tailings
- Mine Area
- Study Area

J.R. SIMPLOT COMPANY

CONDA/WOODALL MOUNTAIN MINE
HEALTH AND SAFETY PLAN

FIGURE 1

CONDA / WOODALL MOUNTAIN PHOSPHATE MINE LOCATION

PRJ: 0442-001-900	DATE: JULY 12, 2011	
REV: 0	BY: CRL	CHECKED: RPS

FORMATION ENVIRONMENTAL

Google Maps

Start **Conda, ID**
End **Caribou Memorial Hospital-ER**
Uninc Caribou County, Idaho
Travel **8.9 mi – about 18 mins**

Conda, ID

Drive: 8.9 mi – about 18 mins

1. Head **north** on **Conda Rd**	1.9 mi	4 mins
2. Turn **left** at **ID-34**	5.5 mi	9 mins
3. Turn **left** at **3rd St E**	0.3 mi	1 min
4. Turn **right** at **2nd St**	0.9 mi	2 mins
5. Turn **left** at **3rd W**	0.2 mi	1 min
6. Turn **right**	331 ft	

Caribou Memorial Hospital-ER
Uninc Caribou County, Idaho

These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

Overview

Start

End

J.R. Simplot Company Conda/Woodall Mountain Mine HASP	
FIGURE 2 **Hospital Vicinity Map**	
PRJ: 0442-001-900	DATE: July 12, 2011
REV: 0	BY: JPL CHK: RPS
FORMATION ENVIRONMENTAL	

ATTACHMENT A

PLAN ADDENDA

ATTACHMENT B

‘TAILGATE’ SAFETY MEETING FORM

“TAILGATE” SAFETY MEETING FORM

The following personnel were present at the “tailgate” (daily pre-job) safety briefing

conducted (time):____

on (date):____

at (location):____

by (printed name):____________________________________

(signature):______________________________________

(title):____

And have read the above plan, are familiar with its provisions and the following discussed topics:

Name Printed	Signature	Date

ATTACHMENT C

WIND CHILL CHART

Wind Chill Factor

Actual air temperature °F

calm	40	30	20	10	0	-10	-20	-30	-40

Apparent temperature

Wind speed (mph)

10	34	21	9	-4	-16	-28	-41	-53	-66
20	30	17	4	-9	-22	-35	-48	-61	-74
30	28	15	1	-12	-26	-39	-53	-67	-80
40	27	13	-1	-15	-29	-43	-57	-71	-84
50	26	12	-3	-17	-31	-45	-60	-74	-88
60	25	10	-4	-19	-33	-48	-62	-76	-91

Frostbite times: *30 minutes* *10 minutes* *5 minutes*

National Weather Service (NWS) Wind Chill Chart adapted May 2004 from http://www.nws.noaa.gov/om/windchill/

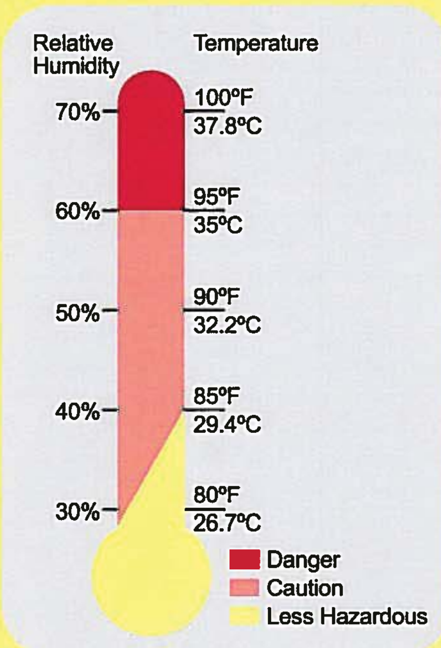
ATTACHMENT D

HEAT STRESS EDUCATION POSTER

The Heat Equation

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are heat exhaustion and heat stroke. If left untreated, **heat exhaustion** could progress to **heat stroke** and possible **death**.



U.S. Department of Labor
Occupational Safety and Health Administration
OSHA 3154
2002

Heat Exhaustion

What are the symptoms?

HEADACHES; DIZZINESS OR LIGHTHEADEDNESS; WEAKNESS; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; UPSET STOMACH; VOMITING; DECREASED OR DARK-COLORED URINE; FAINTING OR PASSING OUT; AND PALE, CLAMMY SKIN

What should you do?

- Act immediately. If not treated, heat exhaustion may advance to heat stroke or death.
- Move the victim to a cool, shaded area to rest. Don't leave the person alone. If symptoms include dizziness or lightheadedness, lay the victim on his or her back and raise the legs 6 to 8 inches. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or applying a wet cloth to the person's skin.
- Call 911 for emergency help if the person does not feel better in a few minutes.

Heat Stroke–A Medical Emergency

What are the symptoms?

DRY, PALE SKIN WITH NO SWEATING; HOT, RED SKIN THAT LOOKS SUNBURNED; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; SEIZURES OR FITS; AND UNCONCIOUSNESS WITH NO RESPONSE

What should you do?

- Call 911 for emergency help immediately.
- Move the victim to a cool, shaded area. Don't leave the person alone. Lay the victim on his or her back. Move any nearby objects away from the person if symptoms include seizures or fits. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) if alert enough to drink something, unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or wiping the victim with a wet cloth or covering him or her with a wet sheet.
- Place ice packs under the armpits and groin area.

How can you protect yourself and your coworkers?

- Learn the signs and symptoms of heat-induced illnesses and how to respond.
- Train your workforce about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Build up tolerance to the heat and the work activity slowly. This usually takes about 2 weeks.
- Use the buddy system, with people working in pairs.
- Drink plenty of cool water, about a cup every 15 to 20 minutes.
- Wear light, loose-fitting, breathable clothing, such as cotton.
- Take frequent, short breaks in cool, shaded areas to allow the body to cool down.
- Avoid eating large meals before working in hot environments.
- Avoid alcohol or beverages with caffeine. These make the body lose water and increase the risk for heat illnesses.

What factors put you at increased risk?

- Taking certain medications. Check with your health-care provider or pharmacist to see if any medicines you are taking affect you when working in hot environments.
- Having a previous heat-induced illness.
- Wearing personal protective equipment such as a respirator or protective suit.

ATTACHMENT E

CHEMICAL HAZARD DATA FOR SELENIUM, CADMIUM, CHROMIUM, NICKEL, URANIUM AND ZINC

September 2005

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Search

Cadmium dust (as Cd)

CAS 7440-43-9 (metal)

Cd (metal)

RTECS EU9800000 (metal)

Synonyms & Trade Names
Cadmium metal: Cadmium
Other synonyms vary depending upon the specific cadmium compound.

DOT ID & Guide
2570 154 (cadmium compound)

Exposure Limits
NIOSH REL*: Ca See Appendix A [*Note: The REL applies to all Cadmium compounds (as Cd).]

OSHA PEL*: [1910.1027] TWA 0.005 mg/m^3 [*Note: The PEL applies to all Cadmium compounds (as Cd).]

IDLH Ca [9 mg/m^3 (as Cd)]
See: IDLH INDEX

Conversion

Physical Description
Metal: Silver-white, blue-tinged lustrous, odorless solid.

MW: 112.4	BP: 1409°F	MLT: 610°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 8.65 (metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Noncombustible Solid in bulk form, but will burn in powder form.

Incompatibilities & Reactivities
Strong oxidizers; elemental sulfur, selenium & tellurium

Measurement Methods
NIOSH 7048, 7300, 7301, 7303, 9102; OSHA ID121, ID125G, ID189, ID206
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: No recommendation
Eyes: No recommendation
Wash skin: Daily
Remove: No recommendation
Change: Daily

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations (See Appendix E) NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion

Symptoms Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]

Target Organs respiratory system, kidneys, prostate, blood

Cancer Site [prostatic & lung cancer]

See also: INTRODUCTION See ICSC CARD: 0020 See MEDICAL TESTS: 0035

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NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Search

Chromium metal

CAS 7440-47-3

Cr

RTECS GB4200000

Synonyms & Trade Names
Chrome, Chromium

DOT ID & Guide

Exposure Limits

NIOSH REL: TWA 0.5 mg/m^3 See Appendix C

OSHA PEL*: TWA 1 mg/m^3 See Appendix C [*Note: The PEL also applies to insoluble chromium salts.]

IDLH 250 mg/m^3 (as Cr) See: 7440473

Conversion

Physical Description
Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.

MW: 52.0	BP: 4788°F	MLT: 3452°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 7.14
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid in bulk form, but finely divided dust burns rapidly if heated in a flame.

Incompatibilities & Reactivities
Strong oxidizers (such as hydrogen peroxide), alkalis

Measurement Methods
NIOSH 7024, 7300, 7301, 7303, 9102; OSHA ID121, ID125G
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: No recommendation
Eyes: No recommendation
Wash skin: No recommendation
Remove: No recommendation
Change: No recommendation

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH

Up to 2.5 mg/m^3:
(APF = 5) Any quarter-mask respirator. Click here for information on selection of N, R, or P filters.*

Up to 5 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.*
(APF = 10) Any supplied-air respirator*

Up to 12.5 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.*

Up to 25 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 250 mg/m^3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; lung fibrosis (histologic)

Target Organs Eyes, skin, respiratory system

See also: INTRODUCTION See ICSC CARD: 0029 See MEDICAL TESTS: 0052

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NIOSH Pocket Guide to Chemical Hazards

Nickel metal and other compounds (as Ni)

CAS 7440-02-0 (Metal)

Ni (Metal)

RTECS QR5950000 (Metal)

Synonyms & Trade Names
Nickel metal: Elemental nickel, Nickel catalyst
Synonyms of other nickel compounds vary depending upon the specific compound.

DOT ID & Guide

Exposure Limits

NIOSH REL*: Ca TWA 0.015 mg/m³ See Appendix A [*Note: The REL does not apply to Nickel carbonyl.]

OSHA PEL*†: TWA 1 mg/m³ [*Note: The PEL does not apply to Nickel carbonyl.]

IDLH Ca [10 mg/m³ (as Ni)]
See: 7440020

Conversion

Physical Description
Metal: Lustrous, silvery, odorless solid.

MW: 58.7	BP: 5139°F	MLT: 2831°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 8.90 (Metal)
Fl.P: NA	UEL: NA	LEL: NA	

Metal: Combustible Solid; nickel sponge catalyst may ignite SPONTANEOUSLY in air.

Incompatibilities & Reactivities
Strong acids, sulfur, selenium, wood & other combustibles, nickel nitrate

Measurement Methods
NIOSH 7300, 7301, 7303, 9102; OSHA ID121, ID125G
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures)
Skin: Water flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen]

Target Organs Nasal cavities, lungs, skin

Cancer Site [lung and nasal cancer]

See also: INTRODUCTION See ICSC CARD: 0062 See MEDICAL TESTS: 0156

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NIOSH Pocket Guide to Chemical Hazards

Selenium

CAS 7782-49-2

Se

RTECS VS7700000

Synonyms & Trade Names
Elemental selenium, Selenium alloy

DOT ID & Guide
2658 152 (powder)

Exposure Limits

NIOSH REL*: TWA 0.2 mg/m^3 [*Note: The REL also applies to other selenium compounds (as Se) except Selenium hexafluoride.]

OSHA PEL*: TWA 0.2 mg/m^3 [*Note: The PEL also applies to other selenium compounds (as Se) except Selenium hexafluoride.]

IDLH 1 mg/m^3 (as Se) See: 7782492

Conversion

Physical Description
Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.]

MW: 79.0	BP: 1265°F	MLT: 392°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 4.28
Fl.P: NA	UEL: NA	LEL: NA	

Combustible Solid

Incompatibilities & Reactivities
Acids, strong oxidizers, chromium trioxide, potassium bromate, cadmium

Measurement Methods
NIOSH 7300, 7301, 7303, 9102, S190 (II-7); OSHA ID121
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA
Up to 1 mg/m^3:
(APF = 5) Any quarter-mask respirator. Click here for information on selection of N, R, or P filters.*
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.*
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage

Target Organs Eyes, skin, respiratory system, liver, kidneys, blood, spleen

See also: INTRODUCTION See ICSC CARD: 0072 See MEDICAL TESTS: 0202

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NIOSH Pocket Guide to Chemical Hazards

Uranium (insoluble compounds, as U)

CAS 7440-61-1 (metal)

U (metal)

RTECS YR3490000 (metal)

Synonyms & Trade Names
Uranium metal: Uranium I
Synonyms of other insoluble uranium compounds vary depending upon the specific compound.

DOT ID & Guide
2979 162 (metal, pyrophoric)

Exposure Limits

NIOSH REL: Ca TWA 0.2 mg/m^3 ST 0.6 mg/m^3 See Appendix A

OSHA PEL†: TWA 0.25 mg/m^3

IDLH Ca [10 mg/m^3 (as U)]
See: 7440611

Conversion

Physical Description
Metal: Silver-white, malleable, ductile, lustrous solid. [Note: Weakly radioactive.]

MW: 238.0	BP: 6895°F	MLT: 2097°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 19.05 (metal)
Fl.P: NA	UEL: NA	LEL: NA	MEC: 60 g/m^3

Metal: Combustible Solid, especially turnings and powder.

Incompatibilities & Reactivities
Carbon dioxide, carbon tetrachloride, nitric acid, fluorine [Note: Complete coverage of uranium metal scrap with oil is essential for prevention of fire.]

Measurement Methods
None available
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Dermatitis; kidney damage; blood changes; [potential occupational carcinogen]; in animals: lung, lymph node damage [Potential for cancer is a result of alpha-emitting properties & radioactive decay products (e.g., radon).]

Target Organs Skin, kidneys, bone marrow, lymphatic system

Cancer Site [lung cancer]

See also: INTRODUCTION See MEDICAL TESTS: 0239

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September 2005

NIOSH Pocket Guide to Chemical Hazards

Zinc oxide

CAS 1314-13-2

ZnO

RTECS ZH4810000

Synonyms & Trade Names
Zinc peroxide

DOT ID & Guide
1516 143

Exposure Limits

NIOSH REL: Dust: TWA 5 mg/m^3 C 15 mg/m^3
Fume: TWA 5 mg/m^3 ST 10 mg/m^3

OSHA PEL†: TWA 5 mg/m^3 (fume) TWA 15 mg/m^3 (total dust) TWA 5 mg/m^3 (resp dust)

IDLH 500 mg/m^3 See: 1314132

Conversion

Physical Description
White, odorless solid.

MW: 81.4	BP: ?	MLT: 3587°F	Sol(64°F): 0.0004%
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.61
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid

Incompatibilities & Reactivities
Chlorinated rubber (at 419°F), water [Note: Slowly decomposed by water.]

Measurement Methods
NIOSH 7303, 7502; OSHA ID121, ID143
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection)
Skin: No recommendation
Eyes: No recommendation
Wash skin: No recommendation
Remove: No recommendation
Change: No recommendation

First Aid (See procedures)

Breathing: Respiratory support

Respirator Recommendations NIOSH/OSHA

Up to 50 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 125 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.

Up to 250 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 500 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation

Symptoms Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function

Target Organs respiratory system

See also: INTRODUCTION See ICSC CARD: 0208 See MEDICAL TESTS: 0246

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ATTACHMENT F

ACCIDENT REPORT FORM

ACCIDENT REPORT FORM

Employee Injury or Illness:

Name: ______________________ Date: ______________________

Occupation: ______________________ Part of body: ______________________

Nature of injury or illness: ______________________

Object/equipment/element inflicting injury or illness: ______________________

Person with most control o f object/equipment/etc.: ______________________

Job or activity at time of accident: ______________________

Exact location: ______________________

Property Damage:

Property damaged: ______________________

Estimated cost: ______________________ Actual cost: ______________________

Nature of damage: ______________________

Object/equipment inflicting damage: ______________________

Vehicle Speed: ______________________ Registration No: ______________________

Department: ______________________

Date of Occurrence: ______________________ Time: ______________________

Date Reported: ______________________

Describe clearly how the accident occurred (what happened) for all motor vehicle accidents, draw a diagram on the other side:

____

____

____

____

The cause of the accident: What acts, failure to act, and/or conditions contributed most directly to this accident? Describe unsafe acts and/or unsafe conditions:

____

____

____

Explain specifically why these act and/or conditions existed:

____

____

____

____

____

____

Loss of Severity Potential: ☐ Minor ☐ Serious

Probable Recurrence Rage: ☐ Frequent ☐ Occasional ☐ Rare

What action has or will be taken to prevent recurrence? (List items, then place and “x” by items completed and date)

____

____

____

____

____

____

____

Supervisor of Injured Person: ______________________ Date: ______________

Reviewed by Manager: ______________________ Date: ______________

APPENDIX D
Test-Fill Study

MEMORANDUM

TO: Margaretha English – Idaho Department of Environmental Quality

CC: Fran Allans (USEPA Region 10), Doug Tanner (IDEQ), Colleen O'Hara (BLM), Sandi Fisher (FWS), Kelly Wright (Tribes), Gary Billman (IDL), John Lincoln (CH2M Hill), Kim Gower (J.R. Simplot Company), Monty Johnson (J.R. Simplot Company), Alan Prouty (J.R. Simplot Company), Dennis Facer (J.R. Simplot Company), Andy Koulermos (Formation Environmental), John Rahe (Formation Environmental)

FROM: Robbert-Paul Smit – Formation Environmental, LLC.

DATE: May 14, 2012

SUBJECT: Field Tests to Develop a Fill Placement Method Specification for the Field Scale Selenium Plant Uptake Pilot Study. Conda/Woodall Mountain Mine Remedial Investigation and Feasibility Study

---

1.0 INTRODUCTION

This technical memorandum presents field tests which the J.R. Simplot Company (Simplot) would like to perform at the Conda/Woodall Mountain Mine (Conda) to support the development of a construction Method Specification. The Method Specification will guide the fill and cover placement during the regrade of the Field Scale Selenium Plant Uptake Pilot Study (FSPS) overburden pile.

The surface of the FSPS overburden pile will be graded into a 3 (horizontal): 1 (vertical) easterly trending slope to accommodate the FSPS plots. All the FSPS plots will be constructed on the cut area of the regraded overburden pile. The fill area west of the FSPS plots does not form part of the FSPS. However, the fill area will be covered with 18-inches of weathered Dinwoody Formation soils and revegetated with a mix of shallow-rooted low-selenium-accumulating grass species. The seed mix that will be used is the same mix identified in Table 4-2 of the Field Scale Pilot Study Work Plan. The purpose of the vegetative soil cover on the fill area is to minimize infiltration into the newly placed overburden material and thus reduce exposure of the overburden to weathering conditions which could result in releases of selenium and other chemicals of potential concern (COPCs). Revegetating with the grass species identified in Table 4-2 of the Field Scale Pilot Study Work Plan ensures that the bulk of the root mass would remain in the clean soil cover, minimizing root growth into the underlying overburden materials and the potential for uptake of plant-available selenium.

The objective of the proposed field tests is to develop a Method Specification with appropriate quality assurance (QA)/quality control (QC), while considering the intended function of the area west of the FSPS plots.

2.0 PROPOSED TESTS

Simplot proposes to construct seven test pads to evaluate fill-placement methods using scrapers and dozers, with compaction by construction-equipment travel or through use of compactors. Each pad will be used to test a different method of material placement and compaction. The following subsections describe the setting, equipment, and data collection activities associated with construction of the proposed test pads.

2.1 Setting and Preparation

The proposed setting for the test pads is in an area west of the FSPS, along the Woodall Mountain saddle (Figures 1 and 2). This location was selected because of the ample working space and because it provides the earliest opportunity to commence the testing, based on accessibility and schedule considerations. The overburden material to be used in the test pads would be obtained from the overburden piles in the saddle area. The overburden material in the FSPS pile is expected to be of similar composition as the overburden material in piles near the Woodall Mountain saddle, since these materials all came from mine panels completed in the same area (Figure 3).

The saddle area is stable and requires some preparatory work to accommodate the test pads. There is no need to clear trees or brush, only grading to promote runoff (i.e., approximately 1 to 2 percent). Stormwater controls will be installed around the test area to prevent precipitation runoff from the hillside to the northwest from interfering with the test and to prevent runoff from exiting the construction area (Figure 2).

2.2 Equipment

The equipment Simplot plans on using during the construction of the test pads consist of:

- A water truck used for dust control and moisture conditioning, as necessary;
- A backhoe or trackhoe;
- A Global Positioning System (GPS)-guided Caterpillar 637 scraper (Operating Weight: 102,459 lb empty and 184,659 lb loaded);
- A GPS-guided Caterpillar D10 Dozer (Operating Weight: 146,499 lb);
- A Caterpillar 815F Soil Compactor (Operating Weight: 45,765 lb), or similar;
- A Nuclear Densometer (Troxler 3430), or similar; and
- Survey-grade GPS equipment.

2.3 Testing and Data Collection

As previously mentioned, seven different test pads are proposed (Figures 1 and 2). Two test pads will be constructed using scraper placement, four will be constructed by dozer placement, and one will be constructed by push dozing materials into a void.

2.3.1 Fill Placement and Compaction

Each test pad will be constructed of several lifts of fill material. The test pads would include:

1) Test Pad 1 - Scraper placement and bulldozer spreading (if necessary) in relatively uniform lifts of approximately 24 inches. Compaction through equipment travel by having operators split the tracks of the previous scraper placement.

2) Test Pad 2 - Scraper placement and bulldozer spreading (if necessary) in relatively uniform lifts of approximately 36 inches. Compaction through equipment travel by having operators split the tracks of the previous scraper placement.

3) Test Pad 3 - Bulldozer placement in relatively uniform 24" lifts.

4) Test Pad 4 - Bulldozer placement in relatively uniform 36" lifts.

5) Test Pad 5 – Bulldozer placement in relatively uniform 24" lifts with compaction by sheepsfoot compactors.

6) Test Pad 6 – Bulldozer placement in relatively uniform 36" lifts with compaction by sheepsfoot compactors.

7) Test Pad 7 – "Push Dozing" to fill a 20-foot deep void." This method of fill placement is intended to mimic the scenario where deep voids need to be filled through dozing to create safe operating slopes. Test Pad 7 will be situated in a void west of an existing overburden pile (Figure 1). The void area will be deepened by 5 to 10 feet, to accommodate a 20-foot high fill. Overburden material will be piled on top of the overburden pile using scrapers. The piled material will be dozed into the void, receiving no compaction other than from dozer travel when the 20-foot fill gets spread and leveled.

The test pads constructed using scrapers will be approximately 12 feet in height with side slopes ranging between 2(H):1(V) (along the length) and 3(H):1(V) (along the ramps). The approximate dimension of the scraper-placed pads will be 30 feet by 45 feet on top and 80 feet by 120 feet at the base. The test pads constructed by dozer placement will also be approximately 12 feet in height with 2(H):1(V) side slopes and 3(H):1(V) ramp slopes. The approximate dimension of the dozer-placed pads will be 30 feet by 25 feet on top and 80 feet by 95 feet at the base. The approximate dimensions of the dozer-pushed pad (test Pad 7) will be approximately 80x95x20 feet. All test pads will be adequately spaced to allow for equipment travel between the pads.

2.3.2 Measurements and Data Collection

Geotechnical Tests - Three composite samples of overburden material to be used in the test pads and three composite samples from the FSPS pile will be collected for geotechnical analysis (Table 1). The geotechnical data will be compared to document that the overburden materials in the two areas are similar.[1] Each composite sample will be comprised of 3 subsamples[2] taken from test pits and homogenized through manual mixing. These samples will be tested in the laboratory for grain-size analyses (ASTM D422), Atterberg Limits (ASTM D4318), and Standard Proctor Compaction (ASTM D698).

Settlement Measurements - Settlement measurement of the placed material will be performed primarily by surveying the surface elevation of each lift (Table 2). The initial survey measurements will be on an 8-ft by 10-ft square grid system[3], within a 30 feet by 45 feet area of the first lift (Attachment A, Figure A-1). The surface elevation of each subsequent lift will be surveyed on the same grid system, so that data may be obtained from the same locations as the test fill rises. Survey elevations will be obtained

[1] The Unified Soil Classification System characteristics and grain-size analysis results will be compared to determine similarity.
[2] Test pits will be advanced to 3 feet below ground surface (bgs) and each subsample will be collected by scraping the full length of the pit walls.
[3] The grid width is based on the tire-center-lines and the track-guage widths of the scraper and dozer, respectively.

following placement just prior to compaction and following compaction at each location to verify lift thickness and determine the compression of each lift.

Two settlement plates per test pad will be utilized to measure the amount of longer-term settlement beneath the fill due to the added weight of the test fill. The settlement plates (Figure 4) will consist of 16-ft square, ¼" thick steel plates with 1 to 1.5-inch diameter vertical steel pipes with threaded fittings. The settlement plates will be placed on the prepared ground surface, prior to placing the first lift (Figure A-1). Threaded fittings will allow subsequent steel riser pipes to be added as the fill surface rises. Plastic sleeve (PVC) pipes, 2- to 3-inch diameter will be placed over the steel riser pipes to allow the steel pipes to have free movement as the plate settles. Riser pipes will be flagged for maximum visibility to prevent damage by vehicular traffic. Each settlement plate will be surveyed initially for elevation following placement and periodically checked during the test fill program.

Field Compaction Test - Nuclear gage density testing will be performed following placement of each lift to correlate density data with survey measurement and GPS data. Two nuclear gage tests will be performed for each lift during the construction of the pads, at pre-determined random grid patterns (Attachment A, Figure A-1). The densities and moisture contents measured with the nuclear gage will be compared against the appropriate Proctor curve to determine the measured density as a percentage of the maximum dry density for the compactive effort.

2.4 Study Quality Control and Assurance

Quality Control (QC) for the test-fill study will include the compaction and grain-size analyses tests performed prior to the start of the program. Additional QC will include survey control for the subgrade preparation and test pads as well as regular surveying for grade control and lift heights and compression measurements. It is anticipated that at least one QC field nuclear density test will be performed in each test section for each lift with additional tests performed if deemed necessary by project engineers.

Quality assurance (QA) for the test-fill study will include full-time direction by a qualified Formation Environmental geologist or engineer, supervised by a Formation Environmental Idaho-Registered Professional Engineer (PE). Construction of the test pads will be documented using GPS-guided equipment data, field forms (Attachment A), photo documentation, and daily reporting of activities. Additional QA to verify the QC will include laboratory testing, survey measurements, and field nuclear density tests at a rate of 5 percent. All data produced will be reviewed by the PE.

3.0 DOCUMENTATION AND SCHEDULE

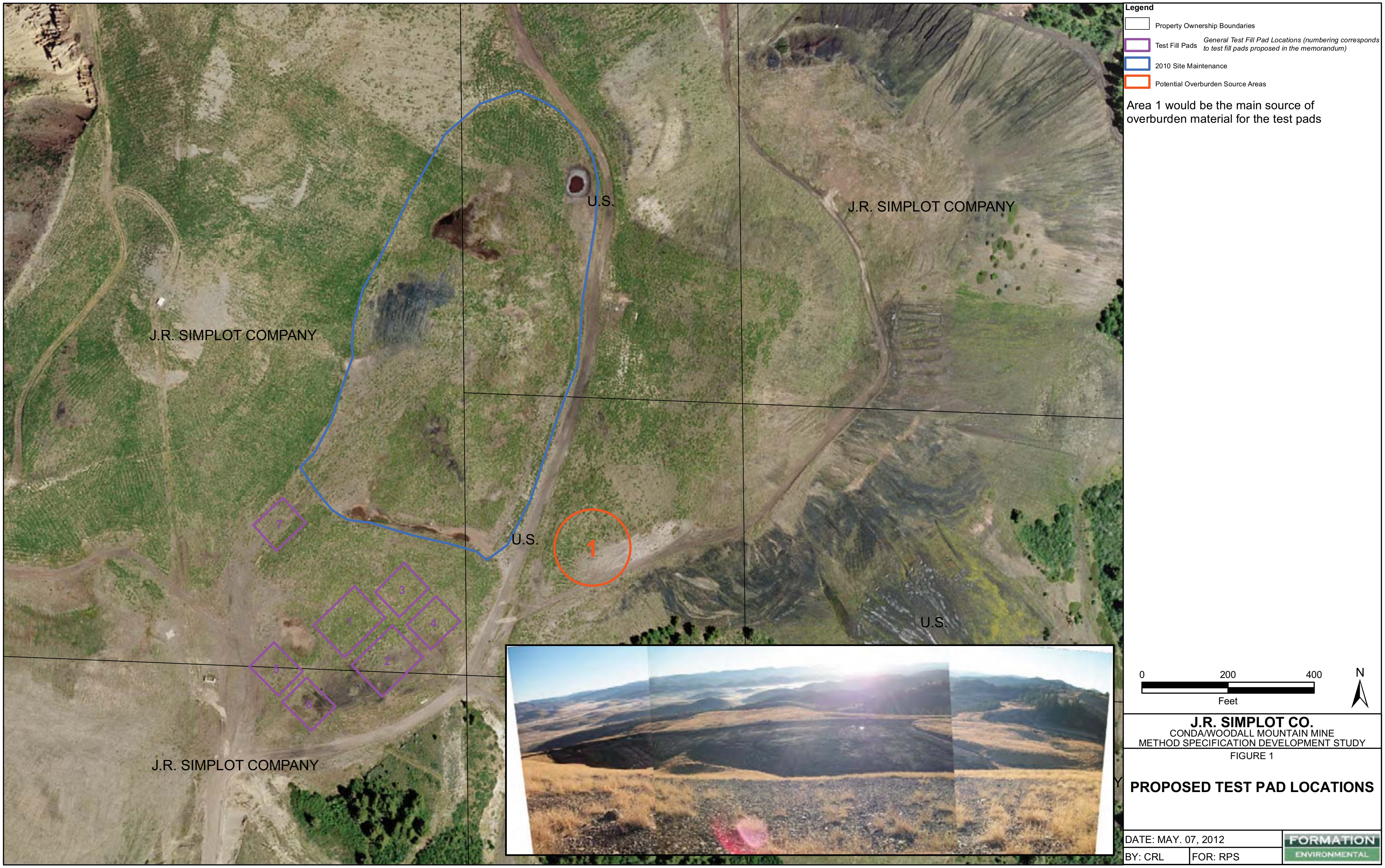
Following the Agencies' review and approval of the proposed test-fill procedure described herein, Simplot will incorporate the test-fill procedure in the Final FSPS Work Plan.

Following the implementation of the test-fill study, Simplot will submit a report summarizing the analysis and interpretation of the information and propose a method specification for fill placement at the FSPS. Both the compaction density data and settlement data will be reviewed to determine the appropriate method specification for placement and compaction, as well as QA/QC testing. It is anticipated that the report will be completed within 3 weeks after completion of the test-fill study for submittal to the Agencies.

The test-fill program would be performed as early in the 2012 construction season as possible. The intent will be to have useful data to apply to major regrading of the FSPS by mid-June.

The test pads will remain in place following the collection of data to support the development of a method specification to collect long term settlement data. Survey elevations will be obtained at three-month intervals for the remainder of 2012 and annually in the spring and fall until no more significant settlement is detected.

Table 3 presents a general schedule relative to the anticipated schedule for the FSPS construction activities.



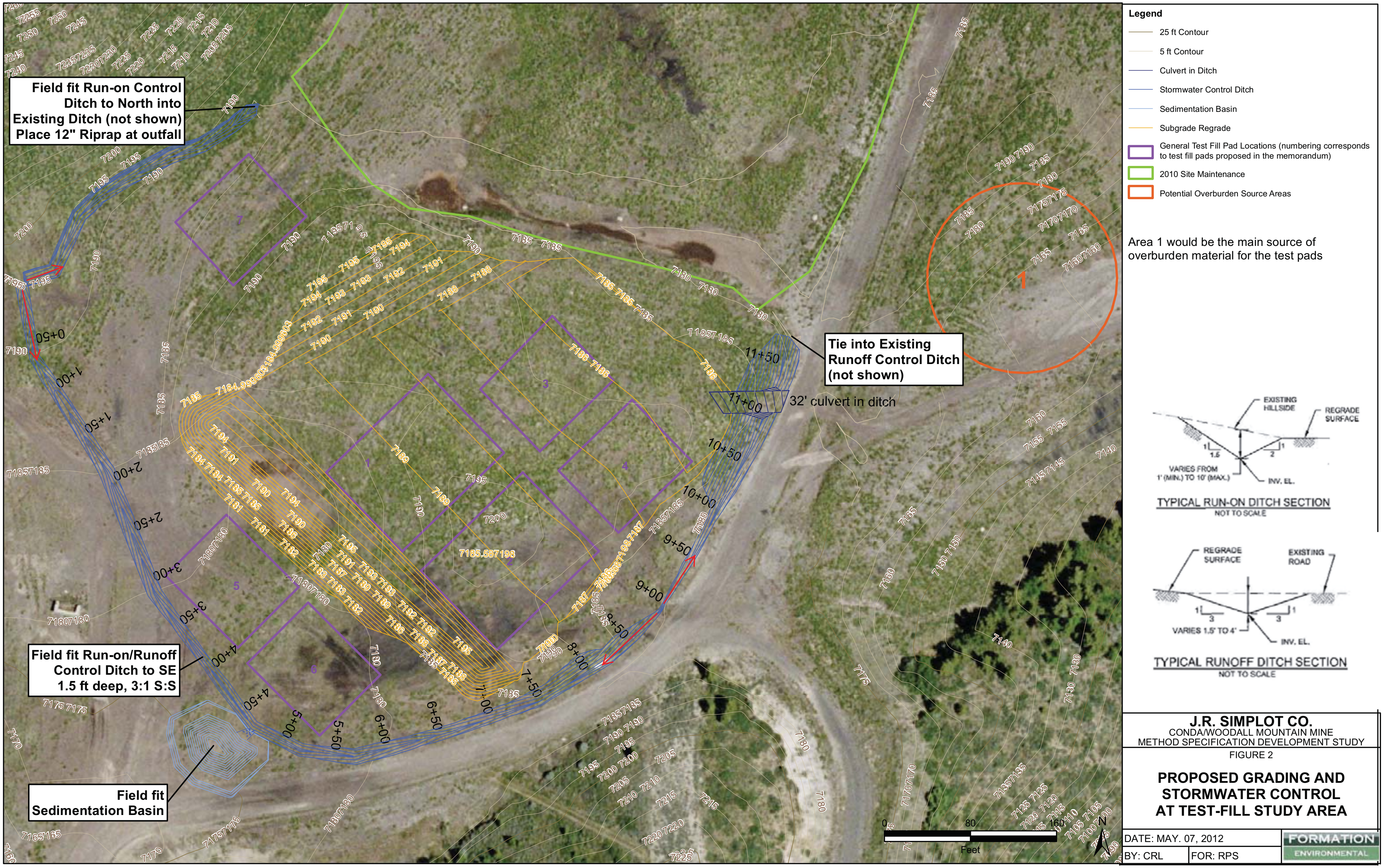
J.R. SIMPLOT CO.
CONDA/WOODALL MOUNTAIN MINE
METHOD SPECIFICATION DEVELOPMENT STUDY

FIGURE 1

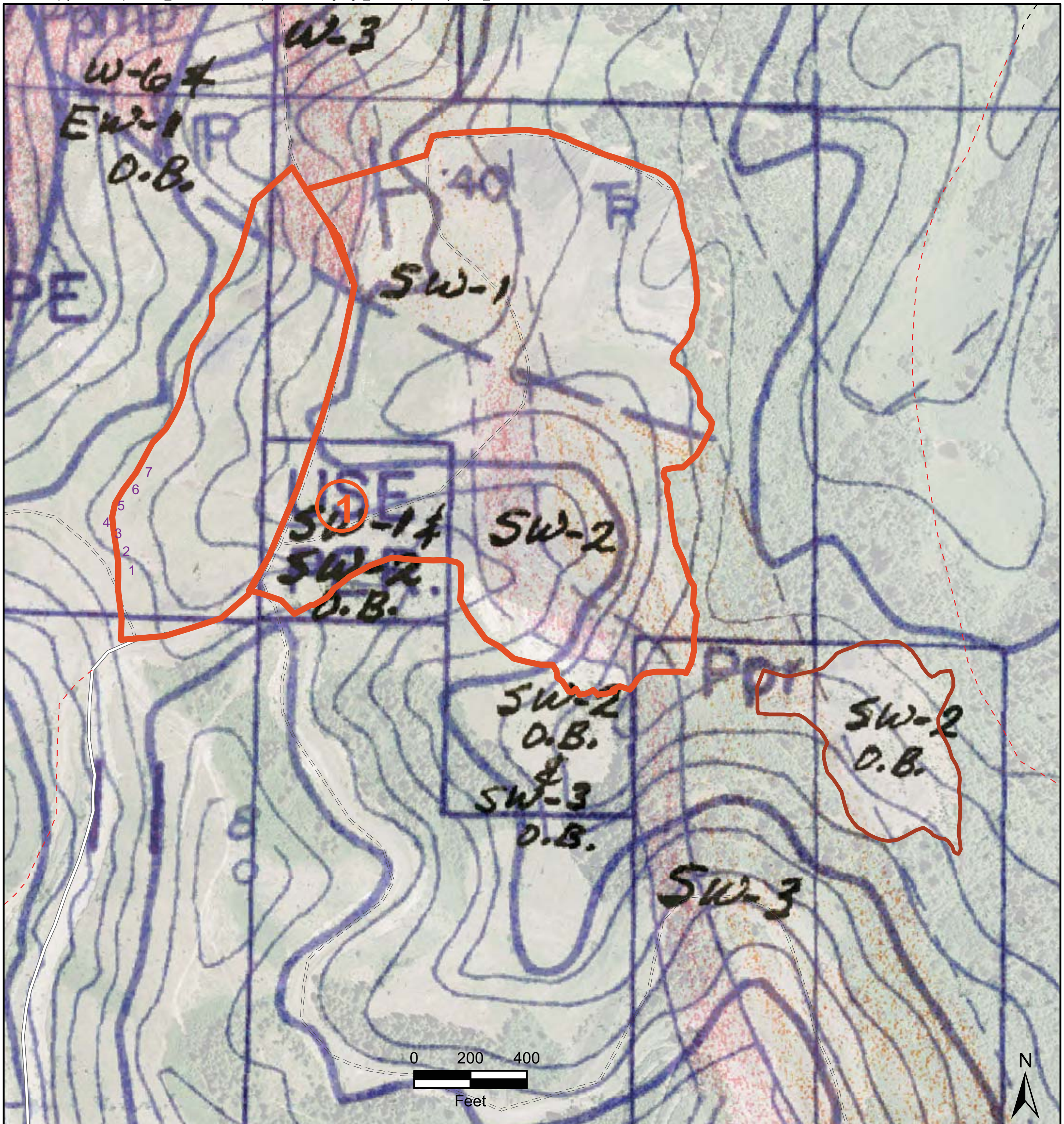
PROPOSED TEST PAD LOCATIONS

DATE: MAY. 07, 2012
BY: CRL | FOR: RPS

FORMATION ENVIRONMENTAL


Legend
25 ft Contour
5 ft Contour
Culvert in Ditch
Stormwater Control Ditch
Sedimentation Basin
Subgrade Regrade
General Test Fill Pad Locations (numbering corresponds to test fill pads proposed in the memorandum)
2010 Site Maintenance
Potential Overburden Source Areas
Area 1 would be the main source of overburden material for the test pads
Field fit Run-on Control Ditch to North into Existing Ditch (not shown) Place 12" Riprap at outfall
Tie into Existing Runoff Control Ditch (not shown)
32' culvert in ditch
Field fit Run-on/Runoff Control Ditch to SE 1.5 ft deep, 3:1 S:S
Field fit Sedimentation Basin
EXISTING HILLSIDE
REGRADE SURFACE
VARIES FROM 1' (MIN.) TO 10' (MAX.)
INV. EL.
TYPICAL RUN-ON DITCH SECTION
NOT TO SCALE
REGRADE SURFACE
EXISTING ROAD
VARIES 1.5' TO 4'
INV. EL.
TYPICAL RUNOFF DITCH SECTION
NOT TO SCALE
J.R. SIMPLOT CO.
CONDA/WOODALL MOUNTAIN MINE
METHOD SPECIFICATION DEVELOPMENT STUDY
FIGURE 2
PROPOSED GRADING AND STORMWATER CONTROL AT TEST-FILL STUDY AREA
DATE: MAY. 07, 2012
BY: CRL
FOR: RPS
FORMATION ENVIRONMENTAL
0 80 160
Feet
N

S:\GIS\arcprj2\010139\plt\RIFS_PilotStudies\CompactionTesting\Fig3_MethdSpecStdyFSPS_aerial.mxd



Legend

- Road
- Unimproved Road
- TRAIL, 4WD
- TRAIL, OTHER THAN 4WD
- Intermittent Stream
- Perennial Stream
- FSPS Boundary
- Pedro Creek ODA NTCRA Boundary

J.R. SIMPLOT COMPANY

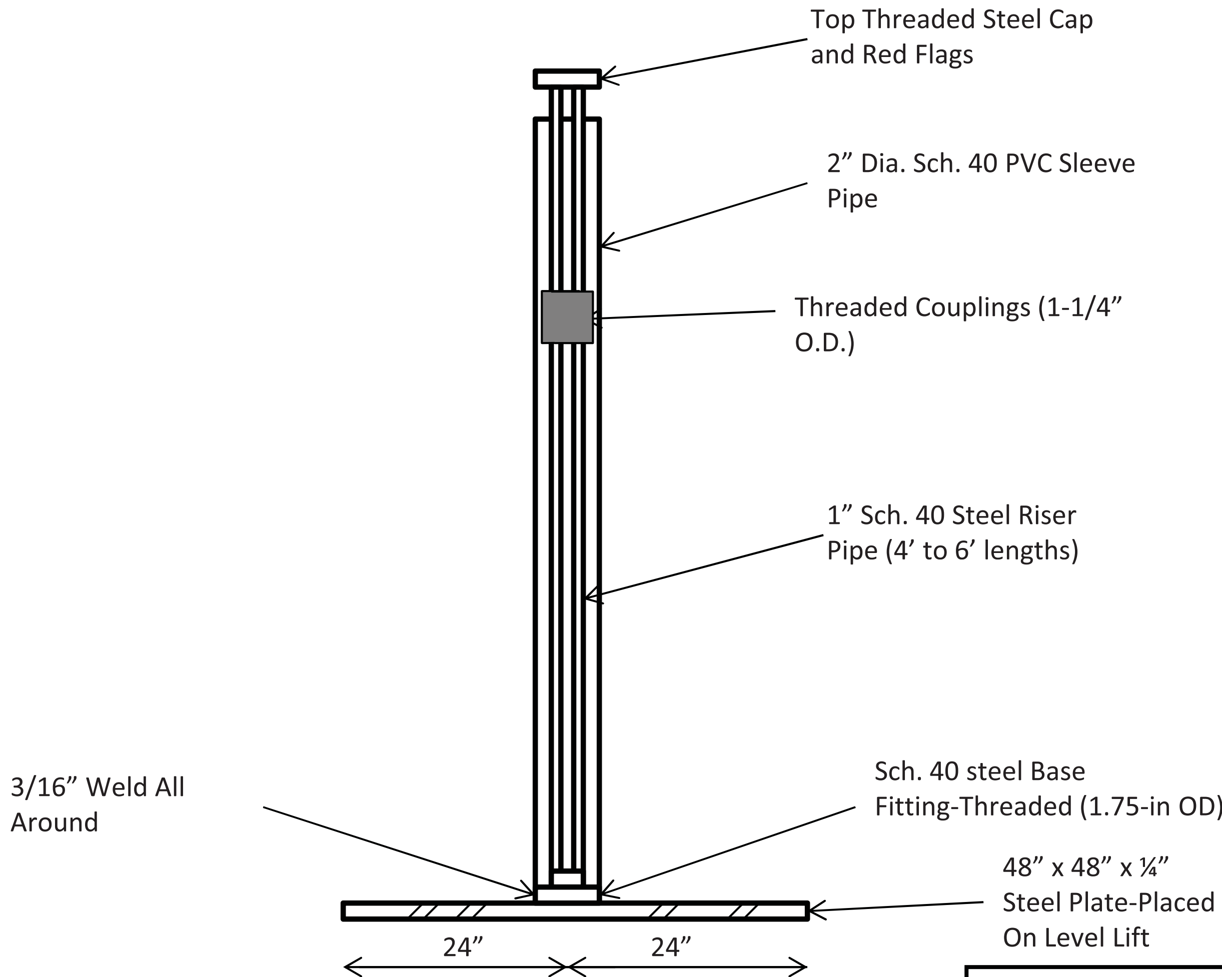
CONDA/WOODALL MOUNTAIN MINE
METHOD SPECIFICATION DEVELOPMENT STUDY

FIGURE 3

MINE PANELS AND OVERBURDEN DISPOSAL AREAS

PRJ: 0442-001-900	DATE: MAY. 07, 2012
REV: 0	BY: CRL FOR: FLC

FORMATION ENVIRONMENTAL



J.R. SIMPLOT COMPANY
Conda/Woodall Mountain Mine
Method Specification Development Study

FIGURE 4
TYPICAL SETTLEMENT PLATE

PRJ: 009-001	APR 30, 2012	
REV: 1	BY: CMH	CHK:RPS

FORMATION ENVIRONMENTAL

Table 1
Sample Summary, Geotechnical Analysis
Conda/Woodall Mountain Mine Fill Placment Method Specification Memorandum

Number	Type	Location	Analysis	Method
3	Composite (3 Subsamples)	Overburden Materials	Grain-Size	ASTM D-422
			Atterberg Limits	ASTM D4318
			Standard Proctor Compaction	ASTM D-698
3	Composite (3 Subsamples)	FSPS Pile	Grain-Size	ASTM D-422
			Atterberg Limits	ASTM D4318
			Standard Proctor Compaction	ASTM D-698
2 per Lift per Test Pad (42 total)	Field measurment	Test Pads 1 - 7	Nuclear gage density testing	

Table 2
Survey Summary
Conda/Woodall Mountain Mine Fill Placement Method Specification Memorandum

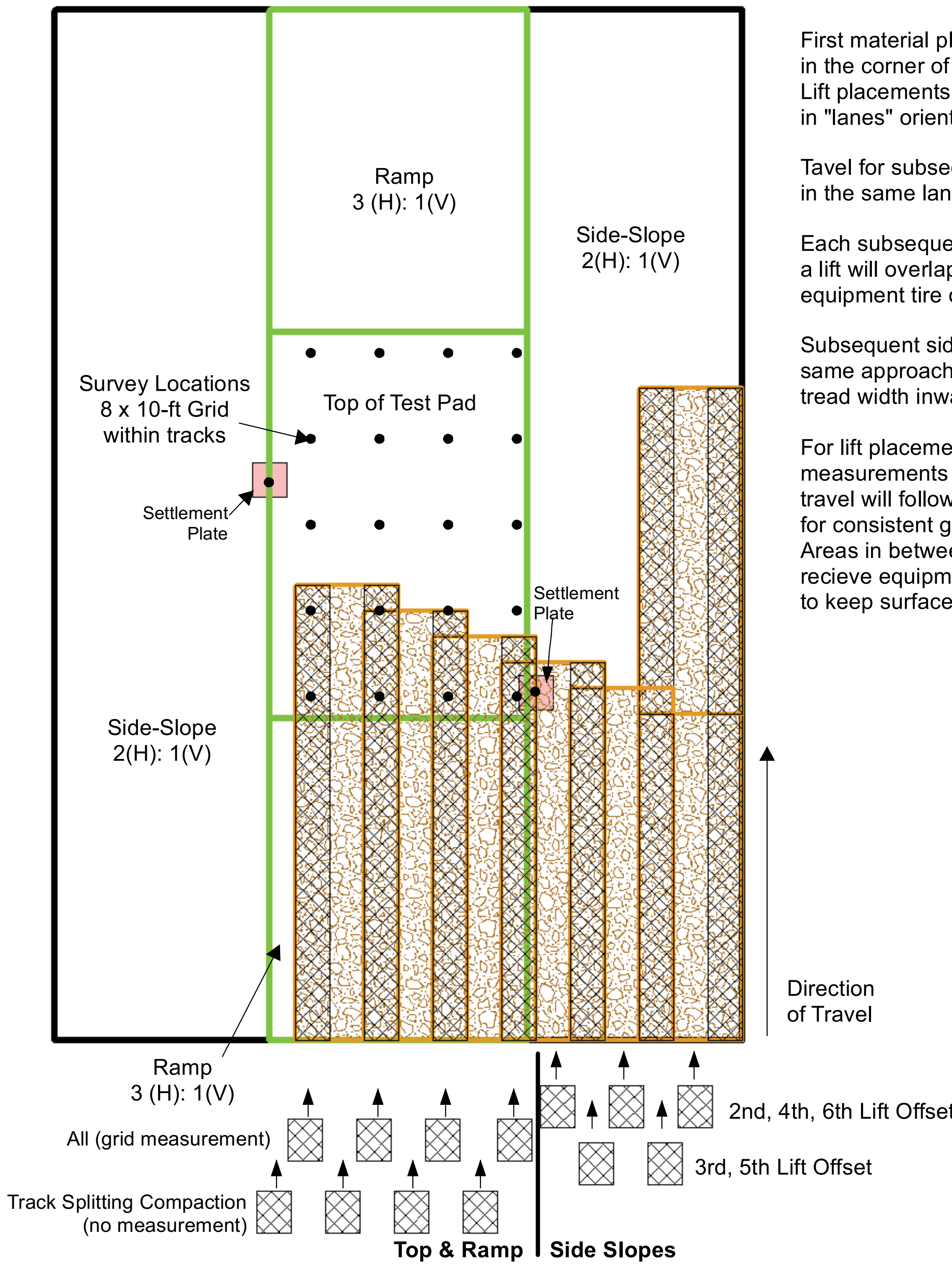
Task	Schedule		Location	Number of Measurements
Settlement Plates	Test Pad 1	At time of placement.	Plate surface	2
		After placement of each lift.	Top of riser pipe	12
	Test Pad 2	At time of placement.	Plate surface	2
		After placement of each lift.	Top of riser pipe	12
	Test Pad 3	At time of placement.	Plate surface	2
		After placement of each lift.	Top of riser pipe	12
	Test Pad 4	At time of placement.	Plate surface	2
		After placement of each lift.	Top of riser pipe	12
	Test Pad 5	At time of placement.	Plate surface	2
		After placement of each lift.	Top of riser pipe	12
	Test Pad 6	At time of placement.	Plate surface	2
		After placement of each lift.	Top of riser pipe	12
	Test Pad 7	At time of placement.	Plate surface	2
		After completion of construction.	Top of riser pipe	2
Each Lift	Test Pad 1	Loose lift measurements	30 x 120-ft Area	120
		Compacted lift measurements	30 x 120-ft Area	120
	Test Pad 2	Loose lift measurements	30 x 120-ft Area	80
		Compacted lift measurements	30 x 120-ft Area	80
	Test Pad 3	Loose lift measurements	30 x 95-ft Area	48
		Compacted lift measurements	30 x 95-ft Area	48
	Test Pad 4	Loose lift measurements	30 x 95-ft Area	32
		Compacted lift measurements	30 x 95-ft Area	32
	Test Pad 5	Loose lift measurements	30 x 95-ft Area	48
		Compacted lift measurements	30 x 95-ft Area	48
	Test Pad 6	Loose lift measurements	30 x 120-ft Area	32
		Compacted lift measurements	30 x 95-ft Area	32
	Test Pad 7	Loose lift measurement	30 x 120-ft Area	8
			TOTAL NUMBER OF LOCATIONS	816
Long Term Elevation Monitoring	**Every 3 months through 2012.**			
	Test Pad 1		30 x 120-ft Area	20 a
	Test Pad 2		30 x 120-ft Area	20 a
	Test Pad 3		30 x 95-ft Area	8 a
	Test Pad 4		30 x 95-ft Area	8 a
	Test Pad 5		30 x 95-ft Area	8 a
	Test Pad 6		30 x 95-ft Area	8 a
	Test Pad 7		30 x 95-ft Area	8 a
	Settlement Plates		Top of riser pipe	14 a
	Biannually (spring and fall) until no further settling is observed.			
	Test Pad 1		30 x 120-ft Area	20 a
	Test Pad 2		30 x 120-ft Area	20 a
	Test Pad 3		30 x 95-ft Area	8 a
	Test Pad 4		30 x 95-ft Area	8 a
	Test Pad 5		30 x 95-ft Area	8 a
	Test Pad 6		30 x 95-ft Area	8 a
	Test Pad 7		30 x 95-ft Area	8 a
	Settlement Plates		Top of riser pipe	14 a

Notes:
a -- Total number of survey points per event. Number of events for long term monitoring dependent on construction completion date, and observed settling

Table 3
Method Specification Development Schedule
Conda/Woodall Mountain Mine Fill Placment Method Specification Memorandum

Task	Number of Calendar Days	Begin	End
Dinwoody Formation borrow area development	120	Monday, June 04, 2012	Tuesday, October 02, 2012
Prepare subgrade and install stormwater controls around test pad area	1	Monday, May 14, 2012	Tuesday, May 15, 2012
Construct test pads	16	Wednesday, May 16, 2012	Friday, June 01, 2012
Data interpretation and development of Draft Method Specification	18	Monday, June 04, 2012	Friday, June 22, 2012
Agency review and approval of Method Specification	14	Monday, June 25, 2012	Monday, July 09, 2012
Preparatory activities in FSPS area (clear/grub, perimeter road work and stormwater controls)	14	Monday, June 04, 2012	Monday, June 18, 2012
Major FSPS grading activities	80	Tuesday, June 19, 2012	Friday, September 07, 2012
Soil cover placement in fill area	14	Monday, September 10, 2012	Monday, September 24, 2012
Construct plots	12	Thursday, September 27, 2012	Tuesday, October 09, 2012
Seed area	5	Wednesday, October 10, 2012	Monday, October 15, 2012

Attachment A



First material placement will be in the corner of the pad. Lift placements will progress in "lanes" oriented lengthwise.

Tavel for subsequent placements in the same lane will follow prior tracks.

Each subsequent lane within a lift will overlap by one equipment tire or tread width.

Subsequent side-slope lifts will follow same approach begining one tire or tread width inward from prior lift.

For lift placement in area of measurements (i.e. footprint of top), travel will follow prior tracks for consistent grid measurements. Areas in between tracks will also recieve equipment travel for each lift, to keep surface even.

Legend

- SurveyGrid
- Pad Base
- Ramp and Top
- Scraper Placement
- Scraper Tire Track
- Settlement Plate

J.R.SIMPLOT COMPANY

Conda/Woodal Mountain Mine

FIGURE A - 1

SOIL PLACEMENT AND SURVEY LOCATIONS

DATE: MAY, 07, 2012

BY: LLV | CHK: RPS

FORMATION ENVIRONMENTAL

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J.R. SIMPLOT COMPANY
CONDA/WOODAL MOUNTAIN MINE
TEST-FILL COMPACTION STUDY

CONSTRUCTION CONTROL AND QUALITY ASSURANCE REPORT
REPORT NO___

Date:	**Weather Conditions:**
Contractor(s) and Equipment:	
Personnel:	
Activities:	
Summary of Activities:	
Samples and QA/QC Testing Performed:	
Communication Summary: (Onsite Phone E-Mail)	
Follow Up Communications:	
Reported By:	**Date:**

J.R. SIMPLOT COMPANY
CONDA/WOODAL MOUNTAIN MINE

RECORD OF MEETING
TEST-FILL COMPACTION STUDY

Date:
Type of Meeting (Pre-Construction, Weekly Construction, Final Walk-Through etc.):

ATTENDEES

Name	Organization	Phone	Email

TOPICS:

PROBLEMS AND RESOLUTIONS:

J.R. SIMPLOT COMPANY
CONDA/WOODAL MOUNTAIN MINE

TEST-FILL COMPACTION STUDY

DESIGN MODIFICATION No.

____
DATE:______

Introduction

Reason for Design Modification

Description of Design Modification

Impact on Schedule and Overall Project Design

Attached Design Sketches/Drawings

By:

Date:

Approval by and Date:

J.R. SIMPLOT COMPANY
CONDA/WOODAL MOUNTAIN MINE

TEST-FILL COMPACTION STUDY
NUCLEAR SOIL TESTING RECORD

Operator:		Set No.:	Density Standard:	Moisture Standard:	Date:
Test No.					
Grading Area					
Station					
Offset					
Depth Below Subgrade					
Contact CPM					
Air Gap CPM					
Wet Density P.C.F. (A)					
Moisture CPM					
Moisture P.C.F. (B)					
Dry Density P.C.F. (C)					
% Moisture $100 \times \frac{B}{C}$					
Soils Classification					
One-Point Test-Density/Moist.					
Optimum Moisture	/	/	/	/	/
Maximum Density (D)					
% Max. Density $100 \times \frac{C}{D}$					
% of Opt. Moist.					
Test Remarks					

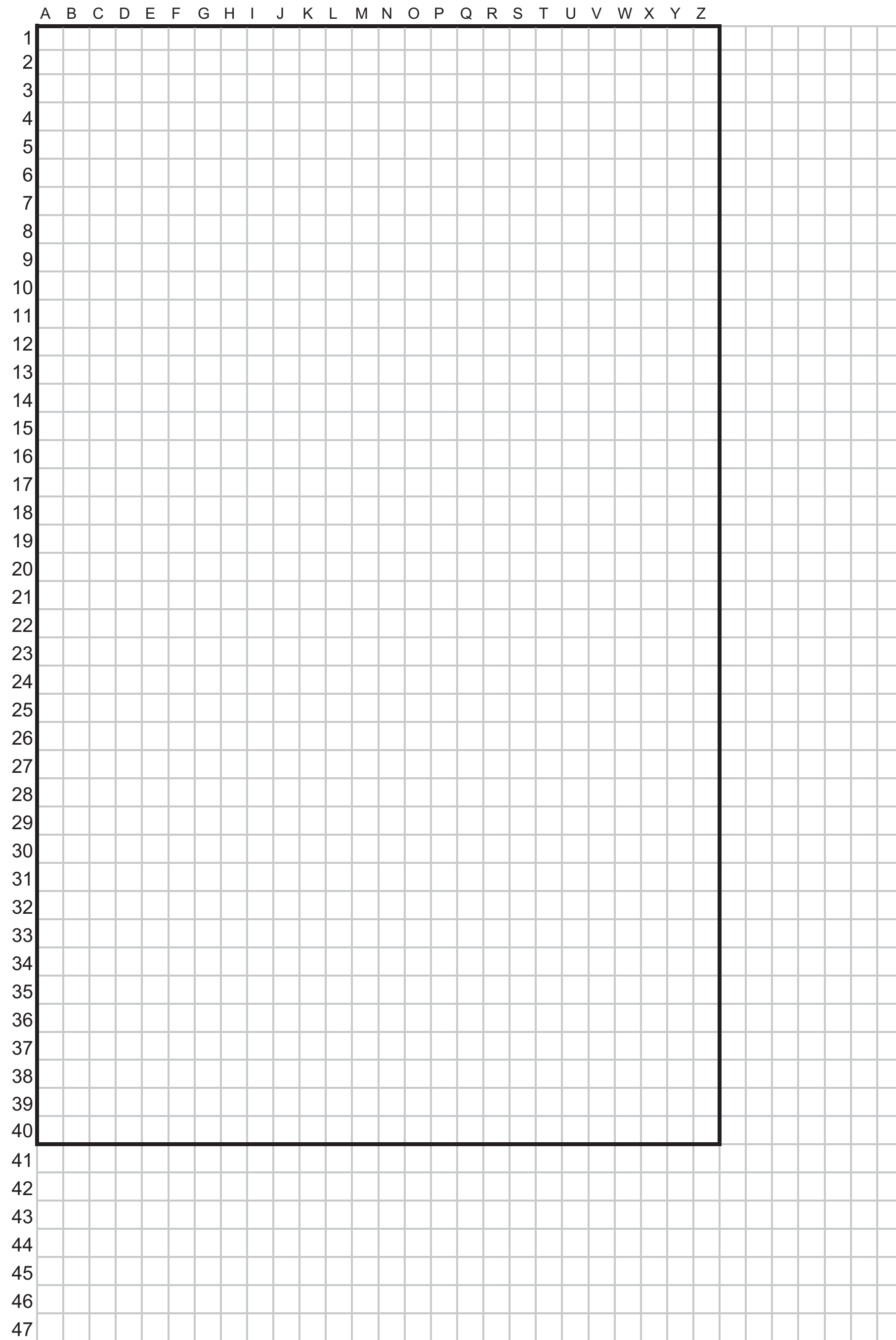
TEST-FILL COMPACTION STUDY CONSTRUCTION RECORD **J.R. SIMPLOT COMPANY - CONDA/WOODAL MOUNTAIN MINE SITE**		PLOT ID:
Date: __________ Time: ________	Personnel: ___________________________________	Weather: _________________Page 1 of __

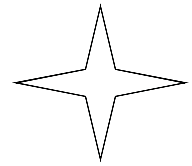
Lift Number

Lift Placement Description:

Lift Description

Scraper Placed Test Pad





(Indicate North)

Approximately 3-ft Squares.

Compaction

SIGNATURE:	**Date:**	

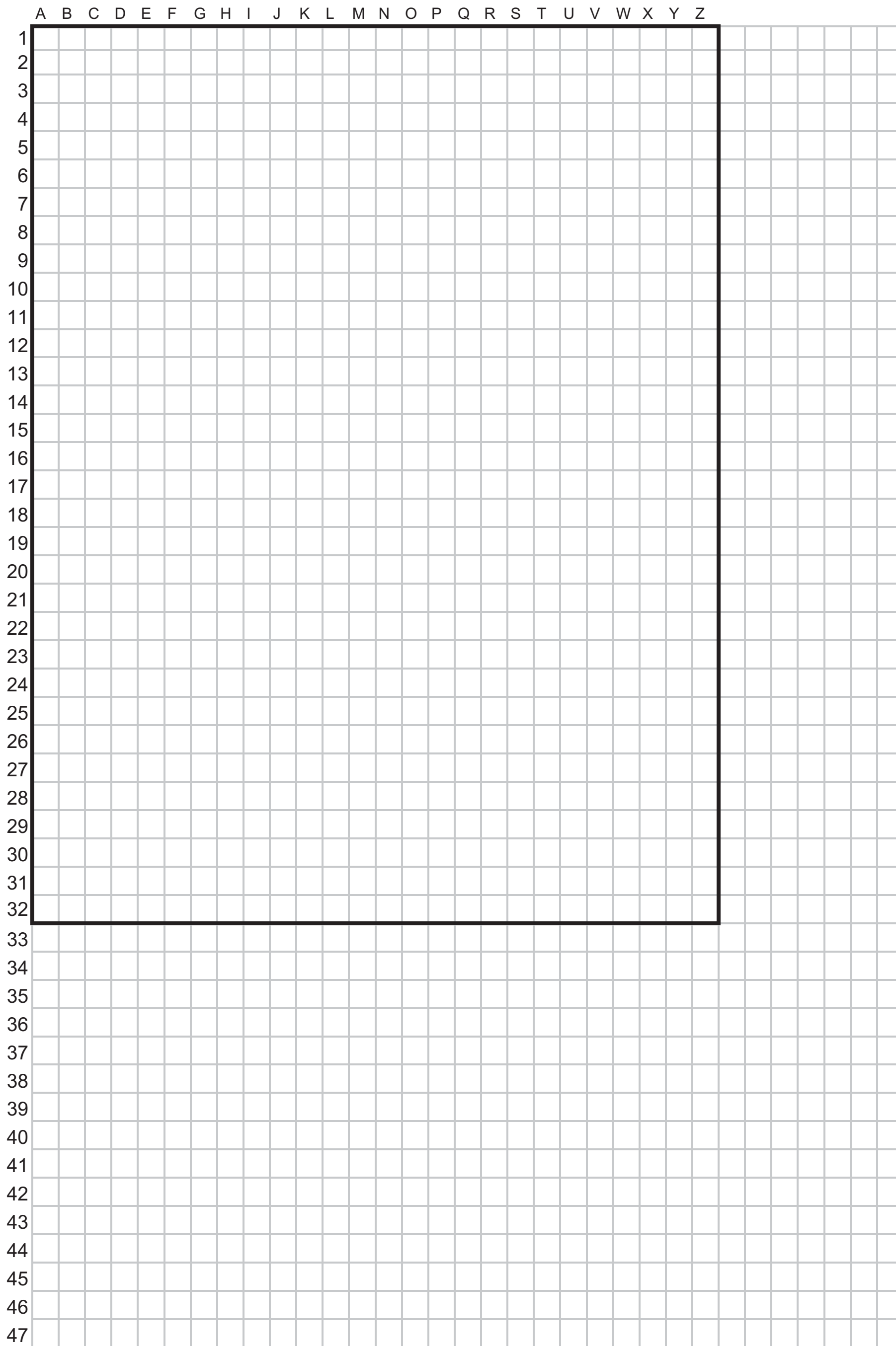
TEST-FILL COMPACTION STUDY CONSTRUCTION RECORD J.R. SIMPLOT COMPANY - CONDA/WOODAL MOUNTAIN MINE SITE		PLOT ID:
Date: __________ Time: ________	Personnel: __________________________________	Weather: _________________Page 1 of __

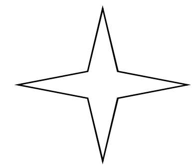
Lift Number

Lift Placement Description:

Lift Description

Dozer Placed Test Pad





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Compaction

SIGNATURE:	**Date:**	

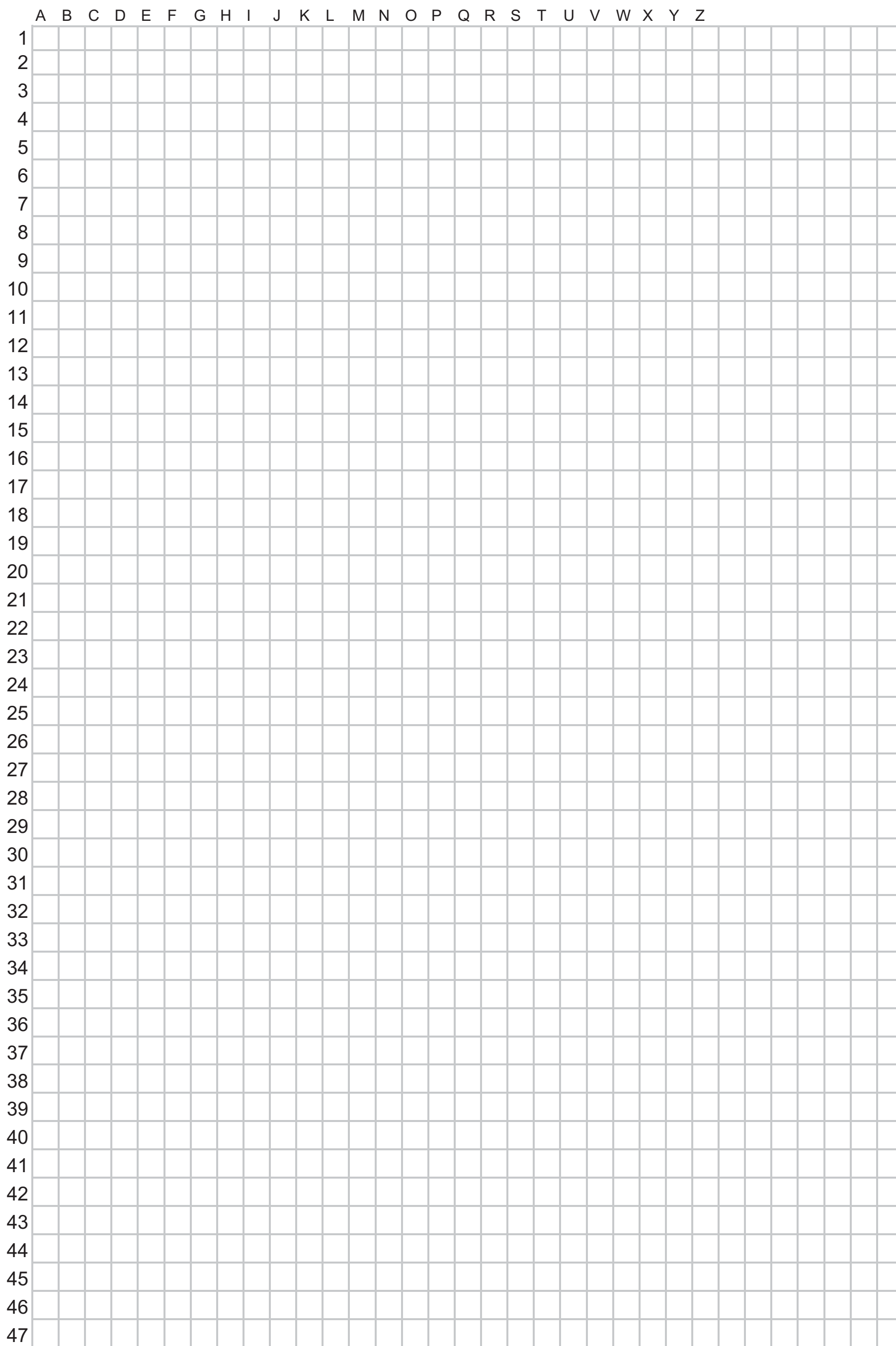
TEST-FILL COMPACTION STUDY CONSTRUCTION RECORD **J.R. SIMPLOT COMPANY - CONDA/WOODAL MOUNTAIN MINE SITE**		PLOT ID:
Date: __________ Time: ________	Personnel: ___________________________________	Weather: _________________Page 1 of __

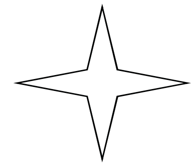
Lift Number

Lift Placement Description:

Lift Description

Void Backfill Test Pad





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Approximately 3-ft Squares.

Compaction

SIGNATURE:	**Date:**	

J.R. SIMPLOT COMPANY
CONDA/WOODAL MOUNTAIN MINE
TEST-FILL COMPACTION STUDY

Settlement Plate Elevation Data

Date/Time	Test Plot ID	Location Description	Lift Number	Pre/Post Compaction	Elev.	Notes

TEST PLOT SURVEY GRID
J.R. SIMPLOT - CONDA/WOODAL MOUNTAIN MINE

LOCATION ID:

Date: __________ Time: ________

Page 1 of ____

Weather Past 48 hours: ____________________________

Location Description: Test Pad 1, Scraper Placement Lift:______________________________________

SURVEY PERSONNEL

Equipment: ____

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2-ft Squares

NOTES

J.R. Simplot Company

CONDA

SIGNATURE: ____

TEST PLOT SURVEY GRID
J.R. SIMPLOT - CONDA/WOODAL MOUNTAIN MINE

LOCATION ID:

Date: __________ Time: ________

Page 1 of ____

Weather Past 48 hours: ____________________________

Location Description: Test Pad 2, Scraper Placement Lift:______________________________________

SURVEY PERSONNEL

Equipment: ____

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2-ft Squares

NOTES

J.R. Simplot Company

CONDA

SIGNATURE: ____

TEST PLOT SURVEY GRID
J.R. SIMPLOT - CONDA/WOODAL MOUNTAIN MINE

LOCATION ID:

Date: __________ Time: ________

Page 1 of ____

Weather Past 48 hours: ____________________________

Location Description: Test Pad 3, Dozer Placement Lift:______________________________________

SURVEY PERSONNEL

Equipment: ____

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2-ft Squares

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SIGNATURE: ____

J.R. Simplot Company

CONDA

TEST PLOT SURVEY GRID
J.R. SIMPLOT - CONDA/WOODAL MOUNTAIN MINE

LOCATION ID:

Date: __________ Time: ________

Page 1 of ____

Weather Past 48 hours: ____________________________

Location Description: Test Pad 4, Dozer Placement Lift:_____________________________________

SURVEY PERSONNEL

Equipment: ____

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2-ft Squares

NOTES

SIGNATURE: ____

J.R. Simplot Company

CONDA

TEST PLOT SURVEY GRID
J.R. SIMPLOT - CONDA/WOODAL MOUNTAIN MINE

LOCATION ID:

Date: __________ Time: ________

Page 1 of ____

Weather Past 48 hours: ___________________________

Location Description: Test Pad 5, Dozer Placement   Lift:____________________________________

SURVEY PERSONNEL

Equipment: ____

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2-ft Squares

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SIGNATURE: ____

J.R. Simplot Company

CONDA

TEST PLOT SURVEY GRID
J.R. SIMPLOT - CONDA/WOODAL MOUNTAIN MINE

LOCATION ID:

Date: __________ Time: ________

Page 1 of ____

Weather Past 48 hours: ___________________________

Location Description: Test Pad 6, Dozer Placement Lift:_____________________________________

SURVEY PERSONNEL

Equipment: ____

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2-ft Squares

NOTES

SIGNATURE: ____

J.R. Simplot Company

CONDA

TEST PLOT SURVEY GRID
J.R. SIMPLOT - CONDA/WOODAL MOUNTAIN MINE

LOCATION ID:

Date: __________ Time: ________

Page 1 of ____

Weather Past 48 hours: ___________________________

Location Description: Test Pad 7, Void Backfill

Lift:_____________________________________

SURVEY PERSONNEL

Equipment: ____

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2-ft Squares

NOTES

J.R. Simplot Company

CONDA

SIGNATURE: ____

TEST PLOT SURVEY RECORD

Test Plot ID:					
Grid ID	PASS #	X	Y	ELEV	NOTES:

Attachment B

Responses to Agency Comments on the April 4, 2012 Memorandum *Field Tests to Develop a Fill Placement Method Specification for the Field Scale Selenium Plant Uptake Pilot Study*,
Conda/Woodall Mountain Mine Remedial Investigation/Feasibility Study
April 23, 2012

1) Section 1.0, page 2, first paragraph

The text should specifically state that the grasses used for revegetation on the soil cover will use the seed mix specified in Table 4-2 of the *Field Scale Pilot Study Work Plan*.

Response to Comment: The text in Section 1 will be revised as follows:

Page 1, Second Paragraph, Fourth Sentence - "However, the fill area will be covered with 18-inches of weathered Dinwoody Formation soils, and revegetated with a mix of shallow-rooted low-selenium-accumulating grass species. The seed mix that will be used is the same mix identified in Table 4-2 of the Field Scale Pilot Study Work Plan."

Page 2, First Paragraph - "Revegetating with the grass species identified in Table 4-2 of the Field Scale Pilot Study Work Plan ensures that the bulk of the root mass would remain in the clean soil cover, minimizing root growth into the underlying overburden materials and the potential for uptake of plant-available selenium."

2) Section 2.2, page 3

a) This section should include a description of the proposed sheepsfoot compactor. This should include information about equipment model number (if known), the operating weight, approximate size, whether the compactor is self-propelled or towed, and whether the compactor includes a vibrating mechanism.

Response to Comment: The following information will be added to the bullet list in Section 2.2:

"A Caterpillar 815F sheepsfoot soil compactor (Operating Weight: 45,765 lb), or similar"

b) Will all the material be moved by the 631 scraper? If so, the 631 is an open bowl type machine that may require a push dozer at the loading area. Will another dozer be available?

Response to Comment: The material will be moved using dual engine 637 Caterpillar Wheel Tractor Scrapers. These units can self load without the aid of a dozer pushing during loading times. They can also be operated in a push-pull tandem arrangement to further enhance their self-loading capability.

c) This section must also list the equipment that will be used to measure compaction (e.g., nuclear density gage, sand cone apparatus).

Response to Comment: The following information will be added to the bullet list in Section 2.2:

"A Nuclear Densometer (Troxler 3430), or similar"

3) Section 2.3. page 3 and Figure 1

The memorandum must clarify whether the indicated dimensions are for the base or the top of the pad, as well as what are the side slopes. Assuming a 2:1 slope, an 8-foot thickness, and a 30 ft by 45 ft top dimension, the minimum pad dimensions at the bottom would be 62 ft by 77 ft. This would leave no room between pads for equipment to maneuver.

Response to Comment: Section 2.3 will be revised as follows:

"As previously mentioned, seven different test pads are proposed (Figure 1). Six test pads will be constructed using scraper placement, and one will be constructed by push dozing materials into a void. The test pads constructed using scrapers will be approximately 12 feet in height with side slopes ranging between 2(H):1(V) (along the length) and 3(H):1(V) (along the width). The approximate dimension of the scraper-placed pads will be 30 feet by 45 feet on top and 80 feet by 120 feet at the base. All test pads will be adequately spaced to allow for equipment travel between the pads."

In addition, Figure 1 will be revised to depict the base dimensions of the pads.

4) Section 2.3.1, page 3, Test Pad 3

Provide description of how the dozer placement will occur (e.g., whether it will be simply pushed off the side of the ODA or will it be pushed down, leveled and compacted).

Response to Comment: Bullet number 7 under Section 2.3.1 will be revised as follows:

"Test Pad 7 – "Push Dozing" to fill a 20-foot deep void." This method of fill placement is intended to mimic the scenario where deep voids need to be filled through dozing to create safe operating slopes. Test Pad 7 will be situated in a void west of an existing overburden pile (Figure 1). The void area will be deepened by 5 to 10 feet, to accommodate a 20-foot high fill. Overburden material will be piled on top of the overburden pile using scrapers. The piled material will be dozed into the void, receiving no compaction other than from dozer travel when the 20-foot fill gets spread and leveled."

5) Section 2.3.1, page 4, Test Pad 7

a) The text should indicate the total depth of the test pad fill. The total depth for Test Pad 7 should be similar to the other test pads.

Response to Comment: Please see the response to Comment 4.

b) In addition, the text should specifically state that there will be no compactive effort other than the dozer traffic necessary to construct the test pad.

Response to Comment: Please see the response to Comment 4.

c) It is unclear whether there is enough vertical relief to represent potential future push dumping.

Response to Comment: Please see the response to Comment 4.

6) Section 2.3.1, page 4, paragraph after Item 7

For consistency and comparability among all the test pads, all test pads should be constructed 12 feet thick.

Response to Comment: Please see the response to Comment 4.

7) Section 2.3.2, page 4, Geotechnical Tests, last sentence.

a) Atterburg limits should be added to the laboratory tests for determining geotechnical similarity of the overburden materials.

Response to Comment: Atterberg limit testing will be added to the list of laboratory tests.

b) The procedure for homogenizing the composite samples should be identified in the memorandum.

Response to Comment: The third sentence of the referenced paragraph will be revised as follows:

> "Each composite sample will be comprised of 3 subsamples[1] taken from test pits and homogenized through manual mixing."

It is important to note the laboratory will also mechanically mix the bulk samples prior to testing.

> **c)** The decisions rules used to compare the test pad sample results and the FSPS pile sample results and determine whether they are "similar" should be presented.

Response to Comment: Standard protocols for comparison of chemical data in soils are not appropriate for comparison of geotechnical soil properties. Therefore, the typical decision rule development is not applicable. The comparison will be qualitative, by comparing the ranges in grain-size analysis results and characteristics as defined by the Unified Soil Classification System.

8) Section 2.3.2, page 4, Settlement Measurements, first paragraph

> **a)** For comparability and repeatability among the various test pads, the survey measurements should be made on a pre-established grid pattern. The grid pattern and number of measurements per lift for each of the test pads should be specified in the text.

Response to Comment: The text will be revised as follows:

> "The initial survey measurements will be on a 5-ft by 5-ft square grid system ("5-ft grid") within a 30 feet by 45 feet area of the first lift (Attachment A). The surface elevation of each subsequent lift will be surveyed on the same 5-ft grid system, so that data may be obtained from the same locations as the test fill rises."

> **b)** The compression (change in lift thickness due to compactive effort) is measured by survey. Accurate elevation differences by land survey is necessary to obtain useful data. Identify the survey order that will be used to obtain accurate survey measurements.

---

[1] Test pits will be advanced to 3 feet below ground surface (bgs) and each subsample will be collected by scraping the full length of the pit walls.

Response to Comment: The GPS surveying system with horizontal and vertical control stations are accurate to 0.125 foot. This is appropriate for the study since the material would have to settle in orders of feet before potentially affecting runoff (i.e., create depressions that can become pooling areas, or cracks large enough to be of concern on typical 3[H]:1[V] slope).

It is important to note that considering the overburden material properties and the construction equipment, material placement can only be accurate to 0.3 foot, at best. Therefore lifts will only be accurate to plus or minus 0.3 foot.

c) A control point will need to be established so vertical reference can be made. Vertical measurements should be made with either a total station, theodolite, or level. The level could be either optical or laser. GPS can be used to confirm.

Response to Comment: Please see response to comment 8b.

9) Section 2.3.2, page 4, Settlement Measurements, second paragraph

a) The proposal to install the settlement plates on the surface of the second lift is not understood. Settlement plates are typically placed on the original ground surface to detect settlement in the native materials beneath the fill materials. In this case the settlement plates should be placed at the original ground surface to measure any settlement in the ground beneath the fill materials to differentiate settlement in the fill materials from any settlement beneath the fill materials.

Response to Comment: The settlement plates will be placed on the prepared ground, prior to placing the first lift.

b) It is unclear how the riser pipes will be adequately protected from vehicular traffic, and yet still provide representative measurement of the compactive efforts of the vehicle traffic.

Response to Comment: The riser pipes will be marked with red flags and the operator will be aware that they need to be careful around the riser pipes. It is important to note that the purpose of the settlement plates is to detect any settlement that may occur in the subgrade below the test pads. This allows for differentiating between any settlement in the fill from any settlement beneath the fill due to the added weight of the test fill.

c) If any of the riser pipes for the settlement plates are damaged during fill placement, it would be too late to place additional settlement plates. Therefore, two settlement plates should be installed at each test pad in case the riser pipe for one of the settlement plates is damaged.

Response to Comment: Two settlement plates will be installed at each pad as suggested.

10) Section 2.3.2, page 4, Field Compaction Test, and Section 2.4, first paragraph

a) last sentence: To assess the potential variability of densities within each test pad, more than one nuclear gage test should be conducted for each lift of each test pad. In addition, for comparability and repeatability among the various test pads, the density tests should be made on a pre-established grid pattern. The grid pattern and number of measurements per lift for each of the test pads should be specified in the text.

Response to Comment: The following sentence will be added as a second sentence in the referenced paragraph:

"Two nuclear gage tests will be performed for each lift during the construction of the pads, at pre-determined random grid patterns (Attachment A)."

b) general: The text as written is not technically accurate because the Proctor test does not determine maximum dry density; rather, the Proctor test determines maximum density at optimum moisture content. The second sentence of this paragraph should therefore be modified as follows: "The densities and moisture contents measured with the nuclear gage will be compared against the appropriate Proctor values to determine the measured density as a percentage of maximum density (at optimum moisture) for the compactive effort."

Response to Comment: Simplot disagrees. The text as written is technically accurate. As stated in section 1.1 of ASTM D-698 "This test method covers laboratory compaction procedures used to determine the relationship between water content and dry unit weight of soils...", and Section 1.5 of ASTM D-698, states that the test "produces a well defined maximum dry unit weight for non-free draining soils." The compaction curves generated represent a relationship between the dry unit weight and soil water content. The dry unit weight is recorded on the vertical scale and the moisture content on the horizontal scale of the graph. The maximum dry density on the compaction curve is located at the optimum moisture content of the soil.

The text will remain as is.

11) Section 2.4, second paragraph

a) The memorandum should clearly indicate that the CQA officer and his supervising PE are independent of the party responsible for construction. As indicated in previous comments, the persons assuming the CQA role cannot report to the Construction Manager.

Response to Comment: The second paragraph in Section 2.4 will be revised as follows:

> "Quality assurance (QA) for the test-fill study will include full-time direction by a qualified Formation Environmental geologist or engineer, supervised by a Formation Environmental Idaho-Registered Professional Engineer (PE). Construction of the test pads will be documented using GPS-guided equipment data, field forms (Attachment B), photo documentation, and daily reporting of activities. Additional QA to verify the QC will include laboratory testing, survey measurements, and field nuclear density tests at a rate of 5 percent. All data produced will be reviewed by the PE."

b) CQA should provide independent oversight and assurance that the CQC program is properly implemented. The CQA should review and verify the CQC results, identify, correct and document any discrepancies. Therefore, a limited number of geotechnical verification samples should be collected by the CQA officer to compare with the CQC sample results.

Response to Comment: Please see response to comment 11a.

c) second sentence: The information that will be recorded on the field forms should be specified. Alternatively, a sample of the field form should be provided in the referenced document.

Response to Comment: Please see response to comment 11a.

12) Section 3.0, page 5, and Table 1

There may be long term settlement in some of the fill materials after the period proposed in the schedule shown in Table 1. The information about long term settlement may be useful for the remedial actions at this and other sites in Southeast Idaho. Therefore, the settlement measurements should be continued beyond May 2012. At a minimum, the settlement measurements should be conducted at approximately three month intervals during the remainder of 2012, then twice annually in subsequent years until there is no more significant settlement detected.

Response to Comment: The last paragraph of Section 3 will be revised as follows:

"The test-fill program would be performed as early in the 2012 construction season as possible. The intent will be to have useful data to apply to major regrading of the FSPS by mid-June.

The test pads will remain in place following the collection of data to support the development of a method specification to collect long term settlement data. Survey elevations will be obtained at three-month intervals for the remainder of 2012 and annually in the spring and fall until no more significant settlement is detected.

Table 1 presents a general schedule relative to the anticipated schedule for the FSPS construction activities."

13) Figure 3, page 8

Identify the diameter of the threaded fitting that attaches to the 24"X24"X.25" plate. Verify there is enough gap between of the circular fitting and the PVC sleeve pipe to prevent binding.

Response to Comment: The revised figure will present that the threaded couplings used to connect the 1-inch steel risers will use threaded couplings with outer diameters of 1.75 inches.

Response to Agency Comments on the May 8, 2012 Memorandum: *Field Tests to Develop a Fill Placement Method Specification for the Field Scale Selenium Plant Uptake Pilot Study for the Conda/Woodall Mountain Mine Remedial Investigation (RI) and Feasibility Study (FS)*
May 11, 2012
Page 1 of 1

1) Section 2.3.2, page 4, paragraph titled "Settlement Measurements", first paragraph, second sentence, and Appendix A, Figure A-1

There is an inconsistency between the information in the text and on Figure A-1. The text in Section 2.3.2 indicates that survey measurements on each test plot will be made on an 8-ft X 5-ft grid system. However, the information on Figure A-1 indicates that the survey grid will be 8-ft X 10-ft. This inconsistency should be rectified.

Response to Comment: The test in Section 2.3.2 will be corrected to indicate that survey measurements on each test plot will be made on an 8-ft by 10-ft grid system.

2) Table 2

A. This table provides survey information for Test Pads 1 through 6. However, Test Pad 7 is not included in Table 2. The survey information for Test Pad 7, including number of survey measurements and frequency of measurements, should be added to Table 2. Because Test Pad 7 will not be constructed in lifts, the survey measurements need to be made only for the Settlement Plates, and on the top of the completed fill. The Long Term Elevation Monitoring for Test Pad 7 should match the frequency of elevation monitoring for Test Pads 1 through 6.

Response to Comment: The table will be revised to include final lift and long term survey measurements on Test Pad 7.

B. The Number of Measurements for Each Lift does not appear to take into account the difference in lift thicknesses among the various test pads. For example, Test Pad 2 will be constructed with 36-inch lifts, compared to Test Pad 1, which will be constructed with 24-inch lifts. This means that the number of measurements for Test Pad 2 should be 80 (20 measurements X 4 lifts) compared to the number of measurements for Test Pad 1 at 120 (20 measurements X 6 lifts). The number of measurements for Test Pads 4 and 6 (and Test Pad 7 once it is added to the table) should be adjusted accordingly.

Response to Comment: The table will be revised to correct these discrepancies.

CONDA WOODALL MOUNTAIN MINE
TEST-FILL STUDY

FIELD MODIFICATION

MODIFICATION # 1	DATE: 5/30/2012

MODIFICATION TITLE: SCRAPER PLACED TEST-PAD MODIFICATION

DESCRIPTION OF MODIFICATION:

Scraper pad 1 – Compact material following lifts of approximately 12-inches, instead of compacting lifts of approximately 24-inches, as proposed in the Approved Test Fill Plan. The 12-inch lifts will be constructed in approximately 4-inch placements.

Scraper pad 2 – Compact material using a sheepsfoot compactor following lifts of approximately 12-inches, instead of compacting lifts of approximately 36-inches, through scraper travel, as proposed in the Approved Test-Fill Plan. The 12-inch lifts will be constructed in approximately 4-inch placements.

JUSTIFICATION:

To achieve a 24-inch lift in a single placement, the scrapers have to completely slow down and dump the material in a pile. Tire penetration into the loosely-piled material is excessive, leaving a very rough unloading surface (photos 1-4) for operation. It is difficult to maneuver the equipment (i.e., the bowl moves erratically) on the rough surface, resulting in operators having to further slow travel across the unloading area. This approach does not allow for efficient performance of the scrapers.

BENEFIT:

Limiting the lift thickness to 12-inches allows for keeping the unloading area smooth (photo 5). The smoother surface allows for more efficient travel over the unloading area and more efficient compaction. This also allows for more efficient surveyed compression and nuclear gauge measurements versus equipment travel.

The revised test approach allows for obtaining information representing the most effective operation and construction method using scrapers. The revised test approach, by including scraper-travel and sheepsfoot-travel compaction, will provide information to “bound” the compactive efforts for the most efficient fill-placement method.

PREPARED BY:
FORMATION ENVIRONMENTAL, LLC on behalf of the J.R. Simplot Company

R P Smit

Robbert-Paul Smit

CONDA WOODALL MOUNTAIN MINE
TEST-FILL STUDY

FIELD MODIFICATION REQUEST

REQUEST # 1	DATE: 5/30/2012
REQUEST TITLE: SCRAPER PLACED TEST-PAD MODIFICATION	
PHOTO ATTACHMENT	


Photo 1


Photo 2


Photo 3

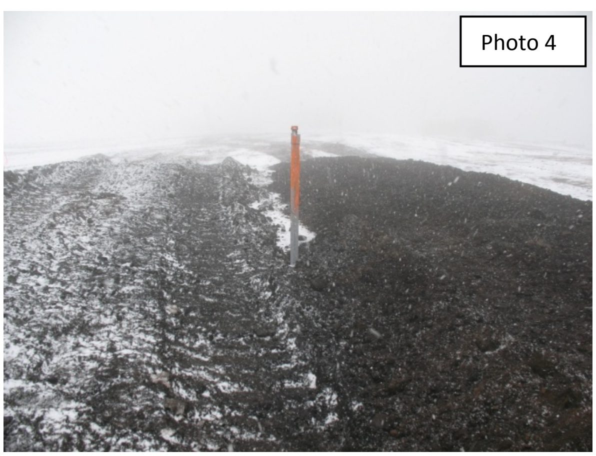
Photo 4


Photo 5

CONDA WOODALL MOUNTAIN MINE
TEST-FILL STUDY

FIELD MODIFICATION

MODIFICATION # 2	DATE: 7/9/2012

MODIFICATION TITLE: ADDITIONAL NUCLEAR GUAGE MEASUREMENTS ON TEST PAD 7

DESCRIPTION OF MODIFICATION:

In-situ density measurements with the nuclear gauge with check point Proctors at the surface and 4 additional depths (e.g., at approximately 4, 8, 12, and 16 feet) below top of the pad.

Material will be excavated as needed to reach the desired depth of fill to determine material densities and moisture contents at depth. Simplot will excavate the trench along the side of the pad, in an area removed from the settlement plate and the survey points used for long-term measurements. The footprint of the trench, along the top of the pad, will extend no more than 3-feet into the pad from the top perimeter edge. The trench will be just wide enough to accommodate an appropriate trench box. It is anticipated that the trench will be approximately 6 feet wide or less. Simplot will follow standard trench-safety protocols during the excavation of the trench.

Once the approximate target depth is reached using the excavator, the nuclear-gauge technician will loosen and level the surface manually prior to advancing the gauge's 12-inch source rod into the material for measurement. The gauge, with the source rod advanced into the material, will measure densities to a maximum depth of the rod.

JUSTIFICATION:

The purpose of the additional testing is to obtain depth-integrated material densification data in a push-dumped overburden pile. This information will help with the long-term settlement evaluations to be performed by the Test-Fill Study. The depth-integrated in-place density and moisture content measurements will support long-term settlement calculations.

BENEFIT:

Provides additional information to evaluate densification due to material weight in a dumped pile of ODA material.

PREPARED BY:

FORMATION ENVIRONMENTAL, LLC on behalf of the J.R. Simplot Company

RPSmit

Robbert-Paul Smit

APPENDIX E
Comments, Comment-Responses, and Comment Response Resolution

General Comments

1) There are a number of typographical errors in the new text material provided. A thorough edit should be conducted of the document prior to the next submittal.

Response to Comment: Comment noted.

2) It is not possible to check the sizing of the various features of the design because design calculations were not provided. Design calculations should be provided for all relevant elements of the designs, including, but not necessarily limited to; sedimentation basin sizing, dissipation basin sizing and configurations, runoff peak flows and storm volumes, ditch sizing and velocities, pipeline and spillway sizing, and riprap sizing.

Response to Comment: The design calculations will be provided in the revised work plan.

3) Who will be conducting the noxious weed germination test and when and where will it be performed?

Response to Comment: The noxious weed germination test will be performed in a controlled setting at the Idaho State Seed Laboratory ahead of stockpiling the composted manure onsite.

4) Simplot should provide registered electronic version of all ASTM standards (test methods utilized for the FSPS) they will be utilizing during the pilot study to the BLM.

Response to Comment: This comment has been retracted, as stated by BLM during the November 29th meeting with the Agencies in Boise.

Specific Comments

1) Figure 2-1

Location NT9-01 should be represented on Figure 2-1

Response to Comment: Transect sampling location NT9-01 is not located in the FSPS area. NT9-01 is situated east of the mass-waste area located north of the FSPS area. Simplot requests clarification as to why NT9-01 should be added to Figure 2-1.

2) Table 3-2

Based on the text in Section 3.4.1, it is assumed this information is from Smoky Canyon. However, the table should indicate the origin of the information presented.

Response to Comment: The title of the table will be revised as follows:

"Total Selenium Concentration at the end of 120 Day growth Period – Smoky Canyon Mine Tailings Impoundment Material Greenhouse Uptake Study."

3) Table 4-2

To fully address Comment 15 on the draft final version of this document, include a numerical value for the typical rooting depth for Pubescent Wheatgrass.

Response to Comment: A numerical value for the typical rooting depth for Pubescent Wheatgrass will be added.

4) Section 4.2, second paragraph, page 14

The discussion indicates that no irrigation will be used on the test plot. However, as discussed during the site visit on October 27, 2011, it may be necessary to irrigate the plots to ensure healthy germination and growth of the seeds. It is our understanding from that discussion that Simplot would utilize a gravity flow delivery system. Therefore, the design for this contingency should be included in the work plan. The watering system should be constructed as the plots are built, as there may be limited personnel and equipment available over the summer (as indicated in the conversation during the site visit). Although weather conditions will determine the need for augmenting soil moisture, the system should be in place in the event watering becomes necessary.

Response to Comment: The irrigation system will consist of movable high-volume sprinklers put in place at the completion of construction and prior to placement of the seeds. Water will be delivered to the sprinklers through temporary hose or piping using standard water trucks outfitted with pumps. The revised work plan will provide additional details about the temporary irrigation system.

5) Section 4.3.1 Construction Sequence

This section should describe the proposed refurbishing of the haul road cutoff to the borrow area.

Response to Comment: The refurbishing of the haul road cutoff to the borrow area will be included in the revised work plan.

6) **Section 4.3.3, page 17**

The discussion indicates that some of the tree material will be saved for use in the reclamation process. It is unknown whether the existing trees and shrubs would have accumulated selenium. If there is information to indicate that such woody material would not be a potential secondary source of selenium to the site soils, it should be presented in the text. If such information does not exist, testing of the plant material should be done to verify that selenium uptake at levels of concern has not occurred. In addition, the location of the cut piles should be identified.

Response to Comment: The intent is to use trees grubbed from native ground upgradient of the pile where total selenium concentrations are not expected to be elevated. The intended would be to use the material to enhance erosion and sedimentations controls (e.g., typically grubbed trees are placed down gradient of disturbed areas to create a filter system which slows down runoff and helps with deposition of sediment). The revised work plan will depict the native areas from which Simplot would like to recycle trees for erosion control.

7) **Section 4.3.4 Stormwater Control Structures, pages 18 and 19**

a) The pilot study is anticipated to last for at least five years, and may extend longer. Therefore, the stormwater controls, dissipation basins, and sedimentation basins should be designed for the 10-year, 24-hour storm event.

Response to Comment: The stormwater controls will be designed to withstand 10-year, 24-hour events.

b) *Run-on and Run-off Controls*: It is stated that these ditches will be vegetated. Discuss whether there are plans to seed the ditches, and if so, indicate the plant species and seeding method.

Response to Comment: The ditches will be broadcast seeded with the approved seed mix for the FSPS. The turf reinforcement mats (TRM) serve as the means to trap the seeds, soil and water, allowing for vegetation growth.

c) *Runoff Controls:* In one sentence it is indicated the velocity of water will range from 5-8 fps, and in another sentence the velocity ranges from 9-10 fps. If the slope of the run-off control ditch is greater than the run-on control ditch slope, which has a velocity of 5-8 fps, it would seem that with a steeper slope the run-off control ditch water would be moving at a faster velocity. Please clarify the range of velocity for the run-off control ditch.

Response to Comment: The discrepancy in anticipated flow velocities for the runoff controls will be corrected.

d) *Sedimentation Basin:* Riprap size should be specified for the CMP spillway discharge.

Response to Comment: The size for the riprap in the sedimentation spillway will be specified in the revised work plan.

8) Section 4.3.4, page 19

The effectiveness and consistency of compacting the ODA with equipment travel is uncertain without a plan that ensures proper compaction of the entire ODA. Without this, some areas may be compacted sufficiently and others very little. See comment #28c.

Response to Comment: Comment noted. Please see response to Comment 13.

9) 4.3.7 Spring Runoff Preparation

a) Cat tracking of the hillside should be done to minimize erosion of the regraded ODA.

Response to Comment: As conveyed during the November 29th meeting with the Agencies in Boise, Simplot will no longer do construction on the FSPS area over the winter. Simplot plans to begin construction as soon as ground conditions allow in the spring of 2012.

b) Due to the steepness of grade, water dissipation structures, i.e. straw waddles, berms, etc. should be placed along the sides of the haul road to slow water velocity as it moves down slope into the temporary sediment basins constructed along the haul road. Please explain how you will slow water velocity and where the water will be directed off the haul road. Additionally, there does not appear to be information in the work plan about the channels cut along the turns of the haul road or the temporary sediment basins constructed to store the water and sediment. Please include drawings to indicate the water channels, dissipation structures, locations of temporary sediment basins and their estimated capacities.

Response to Comment: The revised work plan will include erosion controls details for the haul road as requested.

c) The tackifier should be placed on the ODA material when the snow cover has sufficiently melted. Please revise to indicate the tackifier will be applied to the toe of the ODA and along the graded slope when the snow melts sufficiently to allow for application.

Response to Comment: Please see response to comment 9a.

10) 4.3.8 Plot Material Placement and Seeding – third paragraph, page 20

It is unclear whether the intrinsic nutrient content analysis is currently included in Table 5-2. If not, a line item should be added to Table 5-2 identifying the test method that will be utilized to test the intrinsic nutrient content. In addition, how will the samples be taken, packed and shipped and when will the samples be taken? Please include a standard operating procedure for sampling, and any unique packing and shipping requirements, as well as identifying the test method which will be utilized.

Response to Comment: As described in Section 5.1.1, under the Soil Cover System sampling paragraph, composite samples will be collected from the completed plots. These composite samples will be analyzed for nutrient content as described in Section 5.1.2 and Table 5-2.

11) Section 4.3.9, Plot Construction Quality Assurance and Control, pages 22 through 23

a) The text requires some modifications regarding construction quality assurance (CQA) and construction quality control (CQC). CQC is the process of data collection, inspections, and testing to verify that materials and construction meet approved plans, technical specifications, and other requirements identified in the approved design and/or implementation plan. CQC includes activities both before and during construction to ensure materials and workmanship is compliant with the approved requirements. CQA provides independent oversight and assurance that the CQC program is properly implemented. The CQA process reviews and verifies the CQC results; discrepancies are identified, corrected, and documented. CQA is performed by a party independent of the party responsible for construction. The Construction Manager must therefore not perform sampling and GSA and compaction tests for purposes of CQA. This function may be performed by any qualified individual who does not report to the Construction Manager. Modify the text in Section 4.3.9.2 and elsewhere to maintain the necessary independence between construction/CQC and construction quality assurance tasks.

Response to Comment: The revised text will clarify that the CQA will be performed by a qualified individual(s) independent of the party responsible for the construction activities.

b) The work plan must identify the Lead Engineer, Construction Manager, and the party responsible for Construction Quality Assurance, and present the work chain of command/work organization structure for these persons.

Response to Comment: The revised work plan will identify the Lead Engineer, the Construction Manager, and the party responsible for the Construction Quality Assurance.

12) Section 4.3.9.1, Construction Quality Control, page 21

Sixth Paragraph: Please explain by what method you will perform quality assurance testing of cover thickness for each plot.

Response to Comment: The quality assurance testing of the cover thickness place by either manually measurements or through evaluating the GPS data (if the plot are constructed using GPS guided equipment).

13) Section 4.3.9.1, sixth paragraph, page 21

Compaction quality control (CQC) indicated as "by visual means" is an unacceptable method for determining compaction. The CQC evaluation for equipment travel compaction on fills west of the pile will need to be by evaluated by appropriate compaction test methods (i.e. nuclear density, or sand cone tests).

Response to Comment: Simplot disagrees that compaction of the overburden to standards is necessary. None of the existing ODAs in the south-east Idaho phosphate resource currently receive compaction (other than what is applied by equipment traffic). Many of these ODAs are substantially deeper than the pile to be used for the Field Scale Plant Uptake Pilot Study, as well as the pile in the Pedro Creek ODA to be addressed with a Removal Action. Simplot has not seen any major settling that cannot be controlled with minimal Operation and Maintenance. If an area does settle and needs maintenance, that area is regraded with a dozer, additional capping material is placed, and replanted.

Further, as the ODAs are a mixture of run-of-mine material, it would not be possible to develop a proctor test that would be representative of the ODA. Since the overburden material will be moved and placed with wheeled equipment, the fill areas will receive much more compaction than most ODAs constructed in current operations. The building of ODAs is typically achieved by constructing benches (30-50 feet high) with wheeled equipment and the final shaping is accomplished by dozing to the benches into angle of repose (i.e., filling in the voids between benches). Simplot will instruct the operators to not track each other and apply as much equipment-travel compaction as possible without adding additional work to determine and obtain a target density. Simplot does not believe settlement will be an issue with this project.

14) The first sentence of this subheading states that composted manure will be used in the FSPS to assure that it does not introduce weeds. However, elsewhere in the document there is also reference to “compost/manure” or “manure.” The text should either be modified to consistently reference “composted manure,” or a statement added to this section indicating that any reference to “compost/manure” or “manure” means manure that has been composted to prevent/minimize introduction of weeds.

Response to Comment: The revised text will reference only “composted manure”.

15) Section 4.3.9.1, subsection titled “Survey Quality Control,” page 22.

a) The text should indicate that all surveying will be performed by or under the supervision of a registered land surveyor registered in Idaho.

Response to Comment: The intent is to use GPS-guided equipment during construction and to perform general survey using Simplot’s surveyors. The final QC and as-built surveys will be completed by a third party registered surveyor.

b) The second sentence should be changed to read: “Surveying will be performed to General Order surveying accuracy.”

Response to Comment: The text will be revised as suggested.

c) The final surveys should be stamped by a registered land surveyor registered in Idaho.

Response to Comment: The final as-built survey will be stamped by an Idaho-registered surveyor.

16) Section 4.4, page 23

The text should briefly describe how the excess sediments will be removed from the sediment control structures so that associated design considerations (if any) are identified.

Response to Comment: Typical removal of material from sedimentation ponds and ditches is done with a small tracked excavator. The removed material would be loaded into an articulating truck and moved to an area (e.g., an open pit) where it would be contained, shaped, capped and seeded. The revised work plan will further detail how excess sediments will be removed.

17) Appendix C, Health and Safety Plan, General Comment

The date on top of the Health and Safety Plan, page 1 indicates the plan is 2008, however, all other pages indicate a 2011 plan. Please rectify.

Response to Comment: The referenced date discrepancy will be corrected.

18) Appendix C, Health and Safety Plan, Section 3.1.3.3

Snakes are venomous, not poisonous. Please correct.

Response to Comment: The correction will be made as suggested.

19) Attachment 1, Section 2.0.

Technical specifications for reinforced concrete should be included in the specifications.

Response to Comment: The technical specifications for reinforced concrete will be included in the revised work plan.

20) Attachment 1, Section 02130-Surface Water and Sediment Control During Construction:

a) 1.3 Quality Control:
The word *"excessive"* should be deleted from the sentence. There should not by any sediments from the Work area released into local creeks or onto roads.

Response to Comment: The referenced text will be revised as suggested.

b) 2.2 Materials:
Define "non-contaminated" soils utilized for containment berms.

Response to Comment: The referenced text will be revised as follows:

"Use onsite soils with average selenium concentrations less than 5 mg/kg."

c) This section (2130) should include information on how often inspections of sediment control devices will be conducted and when/if a problem is noted, the timeframe in which the work will be conducted to correct the situation (24 hours, 36 hours, etc.).

Response to Comment: Paragraph F under Section 3.2 of the referenced specification will be revised as follows:

"Remove and dewater silt or sediment buildup behind silt fences, straw bales and temporary sedimentation control berms when material built-up reaches ¼ of the height of the structures, as necessary during construction and near the end of the work. Following the construction work, the sediment control devices will be inspected monthly during spring runoff for 3 years and then annually. In the event a major rain event takes place additional inspections will take place. Problems identified during inspection will be corrected as soon as accessible (i.e., following the weather events and when ground is adequately dry for safe equipment access)."

21) Paragraph 3.2.F

This paragraph should indicate that accumulated sediments behind silt fences, straw bales, and berms shall be removed when the sediments build up to ¼ of the height of the silt fence, straw bale, or berm.

Response to Comment: Please see the response to comment 20.

22) Section 02200- Earthwork

Part 2 Products

2.2 Granular Bedding, Drainage Gravel and Gravel Surfacing
A. "locally available" should be defined in terms of ownership (where will the product be obtained? Simplot land, BLM, etc.?). Reference should be to borrow areas referenced in the plan.

Response to Comment: Paragraph A under Section 2.2 of the referenced specification will be revised as follows:

"Use a locally available chert or Wells Formation from onsite borrow areas located on Simplot's property, or imported, sandy gravel material, having a maximum particle size of 1.5 inches with no more than 2 percent finer than the No. 200 sieve, by weight, for pipe bedding and backfill under and around pipes, manholes and structures."

23) Attachment 1, Specification Section 02200, paragraph 2.2.C.

It is not understood what "articulated concrete block mat runoff" refers to. If this is an alternative to the TRM erosion control, this alternative should be included on the plans and in the specifications included in Attachment 1; otherwise, this paragraph should be deleted.

Response to Comment: The referenced paragraph will be deleted.

24) Attachment 1, Specification Section 02200, paragraph 2.3. A and B.

This section indicates that the Dinwoody cover soil will be combined with topsoil and colluvium. This is inconsistent with descriptions in the main text of the plan. Section 4.2.1 Test Plot Surface Substrate (pages 15-16) does not indicate any combination of the Dinwoody with topsoil or colluvium. The various sections of the work plan should be consistent regarding the cover components and construction. If Simplot believes it necessary to blend, the text should explain why, and how a mix ratio would be determined and applied across the plots.

Response to Comment: The referenced paragraph is intended to state that the Dinwoody material taken from the borrow areas for use as the cover soils will be a blend of the excavated topsoil, colluvium, and fine-grained weathered Dinwoody. The referenced paragraph will be revised as follows:

"The materials used for the Dinwoody covers shall be combined topsoil, colluviums and fine-grained weathered Dinwoody. Coarse un-weathered Dinwoody materials shall not be used."

25) Attachment 1, Specification Section 02200, paragraph 3.1.D, second sentence.

The drawings show the side slopes of the excavated ditches at a slope of 2H:1V, which is an appropriate side slope. A side slope of 1 1/2H:1V is too steep for ditch side slopes that will be protected from erosion by vegetation. The text should therefore be changed to indicate that the side slopes shall be no steeper than 2H:1V.

Response to Comment: The referenced text will be revised as suggested.

26) Attachment 1, Specification Section 02200, paragraph 3.1.F.

This section contains general requirements for blasting, but no specific requirements. The specific requirements for blasting should be added, including, but not necessarily limited to: blasting plan requirements, submittal requirements, experience and certification requirements, regulatory requirements, safety requirements, and methods to minimize collateral blasting damage.

Response to Comment: The revised work plan will include more detailed blasting specifications. Blasting of the Rex Chert material, if necessary, will be by Simplot's Smoky Canyon Mine blasting crew. All blasting will be done following applicable regulations.

27) Attachment 1, Specification Section 02200, paragraph 3.2.H.

The text in this paragraph should be changed to read: "…in that particular area, and the Agencies have determined that the sedimentation basins can be removed."

Response to Comment: The referenced text will be revised as suggested.

28) Attachment 1, Specification Section 02200, paragraph 3.3.

a) Significant modification is needed in this paragraph to assure proper placement and compaction of excavated ODA materials during the rough grading that is currently planned during winter weather conditions. These modifications include:

Response to Comment: Please see response to comment 9a.

b) It is anticipated that most of the excavated ODA materials will not be frozen when first excavated. However, these materials will quickly freeze during normal winter conditions at the site. Therefore, the working areas for active excavation and fill placement/compaction should be minimized. This will allow the best opportunity to excavate unfrozen materials and to attain adequate compaction prior to the ODA materials freezing after placement.

Response to Comment: Please see response to comment 9a.

c) The greatest compactive effort will likely be due to the wheel loads of the loaded trucks or scrapers. Therefore, the specifications should require traffic patterns that maximize the traffic with loaded trucks or scrapers over the most recently placed ODA materials prior to the trucks or scrapers dumping their loads. The specifications should also require that each successive loaded truck or scraper travel over the area of the recently placed materials such they travel over the materials with the least previous compaction (i.e. the loaded trucks or scrapers should not follow in the wheel tracks of the previous traffic). To assure adequate compaction, a minimum number of passes with loaded equipment should be included in the specifications.

Response to Comment: Please see response to comment 13.

d) Any accumulated snow should always be removed prior to excavation and placement of ODA materials. If it is raining or wet, excavation and placement should not be allowed. In addition, if it is extremely cold (less than zero degrees Fahrenheit), excavation and placement should not be allowed.

Response to Comment: Please see response to comment 9a.

e) It is not likely that adequate compaction can be achieved by equipment compaction if lifts are as deep as three feet. Therefore, lists should be limited to two feet maximum, with one to two feet preferred.

Response to Comment: Please see response to comment 13.

f) To minimize excavation of frozen ODA materials and/or placement over frozen materials, a "daily cover" similar to landfill operations should be utilized. This should entail placement of approximately one foot of fill over the areas of active excavation and active fill at the end of each working day. The one foot of daily cover should be removed from the areas of active excavation and active fill prior to commencing each day's earthwork activities.

Response to Comment: Please see response to comment 9a.

g) Regardless of how careful the winter placement procedures are followed, it is possible that there may be areas of subsidence or slumping in the spring when the fill areas thaw out. Therefore, there should be provisions for additional placement and compaction of ODA materials in areas that subside or slump to bring them back to design grades.

Response to Comment: Please see response to comment 9a.

29) Attachment 1, Specification Section 02200, paragraph 3.4.F.

The dimension allowances for embankments are not appropriate. For example, using these allowances, a sedimentation basin could be constructed with the tops of the berms at 0.5 feet lower than the elevations shown on the drawings and the bottom of the basin at 1.5 feet higher than the elevations shown on the drawings. This would result in a sedimentation basin with considerably smaller capacity than designed. The vertical dimension allowance should be ±0.1 feet.

Response to Comment: An Earthwork tolerance of 0.1 ft is not really possible to achieve with materials having maximum particle sizes of 4 to 6 inches. Simplot suggests revising the specification to state:

"The minimum dimensions, and depth, of the sedimentation pond will be achieved with a tolerance of minus 0 and plus 1 ft. An as-built survey will be completed on the structure to assure the proper capacity was constructed."

30) Attachment 1, Specification Section 02610, paragraph 2.2.

Material and/or product information should be provided for the flared culvert inlets.

Response to Comment: The revised design will provide details for the flared culvert inlets.

31) Section 02900- Vegetation Establishment

2.3 Mulch
Both the mulch and manure/fertilizer should be certified weed free, not just the compost.

Response to Comment: The composed manure will be certified weed free as will the hydro mulch.

3.2 Cover Soil
A. This section again indicates a mix of Dinwoody, topsoil and colluvium which does not appear to be discussed in the plot design.

Response to Comment: Please see the response for comment 24.

32) Drawings, General Comments.

a) The current schedule shown in Table 7-1 indicates that vegetation of the test plots will occur during July 2012. A temporary system to supply water to the test plots while the vegetation becomes established will therefore likely be necessary. The temporary watering system should be shown on the drawings.

Response to Comment: The revised work plan will describe the temporary watering system.

b) Installation details for the sediment control BMPs (straw bales, silt fences, and straw wattles) should be included in the drawings.

Response to Comment: The revised design drawings will include installation details for sediment control BMPs.

c) Some of the slopes for portions of the runon and runoff control ditches are very steep, as much as 41.5 percent. Documentation should be provided to show that the TRM erosion protection is adequate for these steep ditch slopes. Otherwise, riprap erosion protection should be utilized for the steeper ditch slopes.

Response to Comment: The revised design will provide details for the maximum slope that TRM will be used on and when riprap will be utilized instead.

d) As these have been indicated to be "preliminary" drawings. Note that when this work plan is finalized the drawings should be sealed and identified as "Ready for Construction."

Response to Comment: Comment noted.

33) Drawing G41, General Plan, General Notes and Drawing List, note 15

Cover for CMP or HDPE pipe should be verified if heavy equipment is anticipated to travel over them.

Response to Comment: Pipe cover will be verified in areas where heavy equipment travel is anticipated over the pipes.

34) Drawings, Sheet G41.

a) Note 9 should be changed to read: "All work shall be performed in accordance with IDEQ, EPA, and BLM requirements."

Response to Comment: The referenced note will be revised as suggested.

b) Note 16 should be deleted. The installation requirements for the items listed in Note 16 are included in the technical specifications.

Response to Comment: The referenced note will be deleted.

35) Drawing C40, Pilot Area Regrading Plan

We will need to see the roadway design for the new road that goes from the second switch-back down to the small pit.

Response to Comment: The revised work plan will provide the requested roadway design.

36) Drawings, Sheet C40.

The horizontal control for the access roads and ditches should be shown on this drawing and/or included in a table.

The southern portion of the access road terminates near Station 1+50 of East Runoff Control Ditch, presumably because of grade considerations. A turnaround should be located near the terminus of the access road to allow maintenance equipment adequate room to turn around.

Response to Comment: The horizontal controls will be added to the revised drawing. The southern terminus of the access road is at the top of the regraded pile where there is adequate room for maintenance equipment to turn around.

37) Drawings, Sheet C41, Section C.

The scale of this cross section is such that details of how the test plots will be constructed are not clear. Additional details or sections should be provided to clarify the grades and dimensions for the test plots and the areas between the test plots.

Response to Comment: The revised work plan will provide additional plot grade details.

38) Drawings, Sheet C44, North Energy Dissipation Basin.

a) The drawing in the vicinity of the CMP pipe beneath the Access Road has several errors: 1) the runoff ditch should be discontinued at the upstream end of the CMP pipeline; 2) the terminus of the pipeline should be shown as an ellipse a few feet from the uphill end of the dissipation basin; and 3) the dimension showing the ditch width at 8.0 feet appears to be in error (the ditch width should be 6.0 feet) and this dimension should be shown at a location upstream where the ditch actually exists.

Response to Comment: The referenced drawing will be corrected.

b) There appears to be a structure like a headwall towards the downstream end of the dissipation basin. If this structure should not be shown on this drawing, it should be eliminated. If this structure is supposed to be there, details should be provided for this structure.

Response to Comment: The lines being interpreted as a headwall will be removed.

c) Horizontal dimensions should be added to show the length and width of the dissipation basin, along with dimensions for the angles at each corner of the dissipation basin.

Response to Comment: The revised drawings will provide the requested dimensions.

39) Drawings, Sheet C44, Runoff Ditch Sections.

The location of the runoff control ditches on the downhill side of the access roads is unusual and is not understood. Locating the ditches on the downhill side of the access roads will result in deposition of sediments generated from the slopes above onto the graveled surface of the access roads. This will require periodic removal of these sediments and potentially replacement of the road gravels if they are disturbed during removal activities. In addition, the cross-slope at 5 percent may contribute toward slide-offs of maintenance vehicles during snowy or slick conditions. The runoff control ditches should be moved to the uphill side of the access roads and the cross-slope of the access roads should be flattened to two to three percent.

Response to Comment: The ditches on the downhill side of the access roads are for storm water control during construction. The intent is to use the road for maintenance access and ditches between the road and the toe of the pile may complicate access to the slopes. However, Simplot is willing to add runoff control ditches between the toe of the pile and the road, as requested. The cross-slope of the access road will also be be flattened to 2 to 3 percent.

40) Drawing C45, Sedimentation Basin Plan, Sections and Details

The locations for the two cross sections for **"B"** are missing on the plan view. These should be added to the "**Sedimentation Basin Plan**" drawing.

Response to Comment: The referenced section lines will be added to the plan view drawing.

41) Drawings, Sheet C45, Sedimentation Basin Plan.

a) Details should be provided for the Heavy Riprap Outfalls. These details should include riprap lengths, riprap depths, sideslopes, geotextiles, etc.

Response to Comment: The requested details will be provided.

b) The flared inlets should be shown at the upstream end of the 30-inch CMP pipes.

Response to Comment: Flared inlets will be included as requested.

c) The dimensions of the radii of the access road should be shown.\

Response to Comment: The dimensions of the radii will be included in the revised drawing.

d) It is unclear how the half round CMP that is the emergency spillway will be constructed across the access road. As shown, it would be a barrier to traffic, with insufficient area for turning around, and it would preclude travel along the eastern and southern portion of the access road. The concept of the half-round spillway across the access road should therefore be reconsidered.

Response to Comment: The revised drawing will clarify how the spillway will be constructed across the access road without being a barrier to traffic.

42) Drawing Sheet C45, Section B.

The use of a ¼-inch thick steel plate for the cutoff wall is not appropriate because it would be difficult to seal against the corrugations of the CPM. This cutoff wall should be constructed of poured-in-place reinforced concrete to provide an effective seal. Details should be added to Section B to show the reinforcing within the cutoff wall.

Response to Comment: The revised design will include poured-in-place reinforced concrete and details will be provided.

43) Drawing C46, Soil Borrow Area Typical Sections and Run-on/Runoff Control Ditches

The sections from this drawing cannot be related to the sections on the previous drawing C45, **"Soil Borrow Area Plan."** The latter shows no lines that can be related to the sections, and they appear to have different designations, i.e., "A C47" compared to "A C46."

Response to Comment: The revised design will provide section lines on the plan view drawing as necessary.

44) Drawing C46, Soil Borrow Area Typical Sections and Run-on/Runoff Control Ditches

Please indicate where the flow for the southern runoff trench for the access road goes to. On the drawing it appears to makes 120^0 turn to the south, or across the south access road, but it is not clear.

Response to Comment: The referenced access road and its runoff ditches already exist. The run-on and runoff ditches presented are along the perimeter of the borrow excavation.

45) Drawing C48, Soil Borrow Areas Sedimentation Basin Plans

a) It is not apparent in this drawing why the North Borrow Basin has a small 12" overflow line (that may easily clog with debris) whereas the South Borrow Basin warrants a 4- foot wide overflow armored spillway. Possibly the latter is expected to handle a larger volume of flow, and potential overflow. Regardless, it would be informative to see an explanation.

Response to Comment: The revised design will provide rationales for the spillway dimensions.

b) Please provide the storage volume of sediment and water for each sediment basin.

Response to Comment: The revised design will provide storage volumes.

c) Extend the riprap over the southern sedimentation basin's beam crest to protect against notching and under-eroding the spillway. Add note to tuck the geotextile a minimum of 12-inches.

Response to Comment: The riprap will be extended as suggested and a note will be added to tuck the geotextile a minimum of 12-inches.

46) Drawing Sheet C48, North Borrow Sedimentation Basin Plan.

a) Additional details are needed for the Riprap at the outlet from the 12"CMP culvert. These details should include riprap size, riprap width, riprap depth, sideslope, and geotextile, etc.

Response to Comment: Additional details (e.g., sizes, horizontal dimensions, and depths, etc.) will be provided.

b) The design intent for the "Screened Inlet" for the 12"CMP overflow pipe from the sedimentation basin is not clear. If a "screen" is actually needed in this location to keep debris and brush from entering the culvert, a trash rack would be a better design. Regardless, details are required for the screen or trash rack, including type and materials, bar size, opening size, and mounting details.

Response to Comment: Additional details will be provided for the "screened inlet".

c) The swale between the North Soil Borrow Area and the North Sedimentation Basin should be protected from erosion with TRM.

Response to Comment: The design will be revised to include protection for the swale.

47) Drawing Sheet C48, South Borrow Sedimentation Basin Plan.

a) The riprap for the Overflow Spillway should be extended both upstream and downstream from the extent of riprap currently shown. The riprap is needed upstream where the spillway crosses the berm to prevent erosion in this area. The riprap size where the spillway crosses the berm can be less than the riprap size on the 2H:1V slope downstream from the berm. The riprap should also be extended into the swale for a few feet because the transition between the 2H:1V slope of the spillway to the 3.3% slope of the swale essentially creates a plunge pool that must be protected from erosion. Additional details should be provided for the riprap, including sizes, horizontal dimensions, and depths.

Response to Comment: The riprap for the Overflow Spillway will be extended as suggested and additional details (e.g., sizes, horizontal dimensions, and depths) will be provided.

b) The swale between the South Soil Borrow Area and the South Sedimentation Basin should be protected from erosion with either riprap or TRM.

Response to Comment: The design will be revised to include protection for the swale.

c) The invert elevation at the outlet from the 12” CMP Overflow Pipe should be shown.

Response to Comment: The design will be revised to include the invert elevation.

From: Margaretha.English@deq.idaho.gov
Sent: Thursday, July 12, 2012 8:45 AM
To: Robbert-Paul Smit
Cc: Kim.Gower@simplot.com; Allans.Fran@epamail.epa.gov; colleen_o'hara@blm.gov; John.Lincoln@CH2M.com; Jeff.Osterman@CH2M.com; sandi_fisher@fws.gov; kwright@shoshonebannocktribes.com; Douglas.Tanner@deq.idaho.gov; Wayne.Crowther@deq.idaho.gov; Mark.day@urs.com; christopher.brown@urs.com; GBillman@idl.idaho.gov; Marcy.Pearhill@deq.idaho.gov; Alan.Prouty@simplot.com
Subject: RE: Response to Agency Comments on the Conda Revised Final Field-Scale Plant Uptake Pilot Study Work Plan

Hi Robbert ,

Colleen has gotten back to me that the BLM's comments have been adequately addressed. So as I discussed with you yesterday, we will be able to finalize this WP with the following tweaks which I believe to be our last comments on this document:

1) **The sentence shown in red must be added to Section 4.3.3.1:**

4.3.3.1 Fill Area Soil Cover
A Dinwoody Formation soil cover will be placed on the regraded area west and northwest of the test plots, to reduce the potential for releases and exposure to selenium and other Chemicals of Potential Concern (COPCs).5 The soil cover will be a minimum of 18 inches thick (Drawing C41). "The Dinwoody cover materials will be compacted to not less than 80 percent and no greater than 85 percent of Standard Proctor (ASTM D698).""
To reduce erosion, the cover will be revegetated with the same plant species mix approved for the study. In addition, wattles and hay bales will be installed to further minimize erosion.

Cover placement CQC and CQA will be performed to provide assurance that the cover is constructed in accordance with the plans in Attachment 1.

2) **The activities referred to in the sentence shown in green must be better defined. The specific CQC and CQA requirements must be identified. Note that some actual density testing will be required for CQA.**
3) **Incorporate approved Field Modifications 2,3, and 4 as indicated in my July 9 approval letter for those mods.**

If you have sufficient clarity on the above items to provide a revised section, then we don't need to have a conference call to resolve comments. If you want to discuss these items further, let me know and I will arrange a call with our engineers. Either way, please provide the revised section language for us to check before you issue the final document. If you decide that no call is necessary, the final document will be due one week from today. Otherwise, the final version is due one week after the call to resolve comments, as stated in my July 2 transmittal letter. Thanks.

--Margie

Marcy – Please add this e-mail to the project record for the Conda/Woodall Mountain Mine. Thank-you.

Margie English

Mining Project Manager
Idaho Department of Environmental Quality
1410 North Hilton

ATTACHMENT 1

Field Scale Plant Uptake Study Construction Drawings and Technical Specifications

FINAL

Conda/Woodall Mountain Mine
Field-Scale Plant Uptake Pilot Study Work Plan

Attachment 1
Drawings and Technical Specifications

J.R. Simplot Company

July, 2012

Prepared for:

J.R. Simplot Company
P.O. Box 912
1130 West Highway 30
Pocatello, ID 83204

Prepared by:

Formation Environmental, LLC
2500 55th Street, Suite 200
Boulder, Colorado 80301

TABLE OF CONTENTS

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LIST OF ATTACHMENTS

1.0 CONSTRUCTION TECHNICAL SPECIFICATIONS

Technical construction specifications are developed in standard Construction Specifications Institute format for the various work items. Included are sections for: Summary of work; mobilization, preparatory work and demobilization; surface water and sediment control during construction; regulatory requirements; clearing and grubbing; earthwork; piping; and vegetation establishment.

Construction quality control and quality assurance (CQC/CQA) are also included in each specification section. These CQC and CQA requirements will provide necessary control of construction and provide assurance that the construction is performed in accordance with the final, approved plans and specifications and approved design changes during construction.

2.0 CONSTRUCTION DRAWINGS

Construction drawings and specifications were developed as part of the design to provide the necessary guidance documents for construction of the Field Scale Plant Uptake Pilot Study (FSPS).

Construction drawings have been prepared for the final grading plans, sections, profiles, and all associated run-on and runoff controls. Construction drawings have also been prepared for the soil borrow areas indicating the extent of the borrow areas; run-on and runoff controls, including sedimentation basins; and regrading for reclamation of the borrow areas. Construction drawings were based on the best available topography in each area.

Construction drawings have been prepared in AutoCAD for printing on typical half-size 11x17 or full size 22x34 sheets. A total of 16 drawings have been prepared and are included below.

CONSTRUCTION SPECIFICATIONS

**TECHNICAL SPECIFICATIONS WITH
CONSTRUCTION QUALITY CONTROL/QUALITY ASSURANCE**

Specification Number	Description
01010	Summary of Work
01060	Regulatory Requirements
01505	Mobilization, Preparatory Work and Demobilization
02100	Clearing and Grubbing
02130	Surface Water and Sediment Control During Construction
02200	Earthwork
02610	Piping
02900	Vegetation Establishment
03300	Concrete

Section 01010–Summary of Work

SUMMARY OF WORK

PART 1 GENERAL

1.1 DESCRIPTION

A. This section includes a general summary of the work to be performed for the FSPS, including regrading the overburden pile, construction of run-on and runoff controls, placement of the study plots and construction of the storm-water control facilities.

B. The work will be performed by the J.R. Simplot Company with portions of the work possibly performed by an outside construction contractor.

C. The work will be performed in 2012, with initial drainage and erosion-control work performed in a first phase. The major regrading and vegetation test plot construction work will be performed in a second phase.

1.2 RELATED SECTIONS

A. All specification sections and Storm-Water Pollution Prevention Plan.

1.3 SCOPE OF WORK

A. The project consists of performing the work as specified, including:

1. Mobilize and prepare for the work including installation of all temporary facilities, access roads, and other support as necessary;

2. Install and maintain temporary sediment, diversion, and storm-water control and runoff-control structures in the FSPS area, including the sedimentation basin and silt fence below the toe of the pile, during construction in accordance with the Storm-Water Pollution Prevention Plan, and as directed. The run-on, runoff ditches, perimeter access road and sedimentation basin with down-gradient silt fence, and other erosion controls, will be installed during the first phase of construction;

3. Provide dust control, as necessary, during all excavating, hauling and placing operations;

4. Perform all construction surveying and quality control and materials testing as specified;

5. Clear and grub the area downslope of the pile where storm water controls will be constructed and west of the pile where fill is to be placed, as well as on isolated portions of the pile where necessary;

6. Excavate topsoil from areas cleared and grubbed and stockpile non-contaminated (average selenium concentration less than 13 mg/kg) topsoil as necessary;

7. Construct the final toe access road as directed during the first phase;

8. Perform regrading of the overburden pile, along with installation of drainage-control features, as designed;

9. Construct the final run-on control ditches on the upslope side of the pile with erosion control provisions;

10. Clear, grub and excavate borrow areas for Dinwoody soil cover material and for chert riprap, boulders and gravel as necessary and as directed;

11. Open and operate the soil borrow area, along with sedimentation basins and associated run-on and runoff controls, haul soils to the FSPS area and place Dinwoody cover soil on the study plots as designed;

12. Install edge runoff ditches as designed and directed;

13. Construct the energy dissipation basins and the armored outfalls at the sedimentation basin as designed and as directed;

14. Provide and install initial, above-ground piping for temporary irrigation system at the FSPS.

15. Hydroseed the final regraded study plots with low selenium uptake plant species as specified;

16. Perform miscellaneous work as necessary and as directed to provide for long-term erosion controls,as directed;

17. Demobilize.

1.4 ADDITIONAL REQUIREMENTS

A. Comply with the following in the conduct of the construction work described above:

1. Comply with terms of all applicable State and Federal regulations and permits, including but not limited to the Storm-Water Pollution Prevention Plan.

2. Comply with all applicable local, State and Federal health and safety rules and regulations including all those required by the Occupational Health and Safety Administration (OSHA).

3. Comply with the Site Health and Safety requirements and provide all health and safety records and documentation for project construction contractors as required by J.R. Simplot

4. Provide complete Project Record Documentation of the work performed each day, amounts of materials used and all quality control records for the project.

5. Provide daily construction quality control surveying and final as-constructed survey of the completed FSPS area. Final survey, following Phase 2 construction, shall be developed by a Professional Land Surveyor registered in the State of Idaho.

END OF SECTION

Section 01060-Regulatory Requirements

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 CODES

A. Comply with the most recent edition of all codes and regulations of applicable regulatory authorities, including:

1. Idaho Department of Environmental Quality (IDEQ) storm water control regulations;

2. IDEQ Air Pollution Control Division emissions requirements;

3. Applicable Federal OSHA regulations;

4. U.S. Environmental Protection Agency requirements, as applicable;

5. U.S. Bureau of Land Management regulations, as applicable; and

6. Site speed limits and traffic control requirements.

B. In the event of conflicts between the requirements of various codes and regulations, comply with the more stringent code or regulation.

C. The FSPS is part of the CERCLA activities at the Conda/Woodall Mountain Mine. Therefore, permits from the various agencies are not required although compliance with applicable agency regulations is required.

1.2 SUBMITTALS

A. All contractors shall provide proof of applicable training required by the J.R., Simplot Company, OSHA and Mine Safety and Health Administration (MSHA) to be eligible to work at the Site. Specific training requirements are presented in the Site Specific Health and Safety Plan.

END OF SECTION

Section 01505-Mobilization, Preparatory Work and Demobilization

MOBILIZATION, PREPARATORY WORK AND DEMOBILIZATION

PART 1 GENERAL

1.1 DESCRIPTION

A. This specification covers the requirements for mobilization, preparatory work, temporary facilities and demobilization. Temporary diversion and sediment control facilities are specified in Section 02130.

1.2 RELATED SECTIONS

A. Section 02130 – Surface Water and Sediment Control During Construction

B. Section 02200 – Earthwork

1.3 SUBMITTALS

A. The J.R. Simplot Company will prepare a written plan, as applicable, with appropriate drawings, identifying all proposed preparatory work including, as applicable, site access and traffic control; construction plan layout; temporary offices and other structures; storage buildings and yards; temporary water supply and distribution; temporary power supply and distribution; and temporary sanitary facilities.

PART 2 PRODUCTS AND EQUIPMENT

A. Utilize appropriate and sufficient products and equipment in the conduct of all preparatory work and the establishment of all temporary facilities, consistent with the nature and requirements of the project and the health and safety of workers and the public.

B. Use suitable corrugated metal pipes (CMPs), or approved alternate, for temporary access across drainage-ways, if necessary.

C. Use water trucks and/or approved dust suppressants on haul roads, as necessary during hauling operations.

D. Haul trucks and equipment shall be properly maintained.

E. Traffic and construction warning signs and haul routes will be utilized.

F. Use suitable products and equipment as necessary to avoid excessive emissions.

PART 3 EXECUTION

3.1 MOBILIZATION

A. The J.R. Simplot Company and Contractor, as applicable, shall mobilize to the Site all labor, materials, equipment, and construction facilities necessary for the proper performance of the work.

3.2 INSTALLATION OF FACILITIES

A. All preparatory work and installation of temporary facilities shall be done in accordance with applicable codes and regulations.

B. Temporary facilities, such as portable restrooms, will be provided as necessary based on work schedule.

C. Facilities shall be installed at locations near the Pedro Creek Overburden Disposal Area (ODA) or borrow areas as directed by J.R. Simplot Company or its representative. All fuel storage shall have appropriate berms surrounding the area to contain the volume of liquids stored.

3.3 SITE SECURITY AND TRAFFIC CONTROL

A. Provide temporary fencing, gates, and signs, as necessary, to limit public access to the Site.Constructor(s) (J.R. Simplot or Contractor) shall be responsible for the safety of all individuals on the Site. Each contractor shall be responsible for the safety of all individuals on the portion of the work for which it is responsible.

B. Conduct all operations so as not to significantly interfere with the normal flow of traffic on local roads near the Site. Where required by the J.R. Simplot Company, flag persons and signage shall be provided to ensure public safety.

3.4 MAINTENANCE AND PROTECTION OF EXISTING DRAINAGE

A. Take all necessary precautions to limit disturbance to natural drainage-ways in the vicinity of the Work, and install temporary culverts and other drainage works, as required, to maintain drainage-ways during construction.

3.5 ACCESS AND HAUL ROADS

A. Existing roads maintained by the J.R. Simplot Company will be used to access the Site in addition to a new access road to the toe of the FSPS pile, to be constructed along an existing road west of the pile.

B. Minimize disturbance to existing streams and vegetation in the construction and maintenance of all access roads.

C. Apply water and/or approved dust suppressants to Site work areas, as necessary.

3.6 SITE MAINTENANCE

A. Maintain the Site free from any unnecessary accumulation of waste materials and rubbish. Contractors shall keep the Site in a safe and tidy condition at all times.

B. Provide necessary protection of the Site and various drainage features during the spring runoff shutdown period.

3.7 CLEANUP AND DEMOBILIZATION

A. Waste materials, debris and rubbish generated by the construction shall be properly collected and disposed of offsite, in accordance with local, State, and Federal Laws and regulations.

B. Leave all areas of the Site in a clean, stable condition.

END OF SECTION

Section 02100-Clearing and Grubbing

CLEARING AND GRUBBING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section covers the removal of trees, vegetation, roots and debris from the surface and the area west and below the toe of the FSPS pile and soil borrow areas. Clearing and grubbing required only for the run-on and runoff ditches, perimeter access road and sedimentation basin will be performed during the initial phase of construction with the remainder of the clearing and grubbing performed in the second phase of construction in 2012.

1.2 RELATED WORK

A. Section 02130 – Surface Water and Sediment Control During Construction

B. Section 02200 – Earthwork

C. Section 02900 – Vegetation Establishment

PART 2 MATERIALS AND EQUIPMENT

2.1 EQUIPMENT

A. Use suitable clearing and grubbing equipment necessary for the work including tree and stump removal equipment, wood chipping equipment and other equipment necessary for completion of the work.

PART 3 CONSTRUCTION REQUIREMENTS

3.1 GENERAL

A. Clear, grub, remove and dispose of all trees and stumps, vegetation, roots and debris within the staked limits of the FSPS area, borrow areas, roads and other designated areas. Do not injure or damage trees, shrubs, or other vegetation and objects to remain intact as designated by J.R. Simplot Company.

3.2 CLEARING

A. All areas within the limits of grading, excavation and construction access areas shall be cleared, including removal and disposal of trees, stumps, logs, limbs, vegetation, rubbish, debris and other material on the natural ground surface.

B. Protect all land monuments, property markers or official datum points until their removal is approved, as applicable. When movement of monuments or markers is deemed necessary, all such monuments or markers shall be carefully referenced for re-establishment before removing.

3.3 GRUBBING

A. Grubbing consists of removing and disposing of roots (one-inch and larger diameter), tree stumps, buried logs, debris, and other underground obstructions.

B. Grub the FSPS pile and new road areas within the boundaries of the structures to a depth of 1.5 feet and remove all stumps, roots, buried logs and other underground debris.

C. Grubbing of the borrow areas shall include removal of the top 6-inches of organic-laden topsoil and stockpiling it for later distribution over areas shown on the Drawings.

3.4 OPTIONAL WOOD CHIPPING

A. If directed, chip wood from clearing operations to add to mulch in hydromulch mixes to be applied to the FSPS area.

3.5 BACKFILLING

A. All stump holes, cuts, depressions and other holes resulting from clearing and grubbing operations within areas designated to receive structures or embankments shall be backfilled with suitable material and compacted as required by Specification Section 02200.

3.6 DISPOSAL OR REUSE

A. Dispose of all materials resulting from clearing and grubbing operations as required for the Project and as field directed.

B. If directed, use cleared trees and brush as natural forest debris or brush matting on the final slopes of the FSPS area for erosion control.

END OF SECTION

Section 02130-Surface Water and Sediment Control During Construction

SURFACE WATER AND SEDIMENT CONTROL DURING CONSTRUCTION

PART 1 GENERAL

1.1 DESCRIPTION

A. This specification section covers the requirements for dewatering the work areas and controlling surface water and sediment during construction.

1.2 RELATED SECTIONS AND DOCUMENTS

A. Section 01505 – Mobilization, Preparatory Work and Demobilization

B. Section 02200 – Earthwork

C. Storm-Water Pollution Prevention Plan

1.3 QUALITY CONTROL

A. Dewatering, as necessary, shall be conducted in such a way that it does not result in the release of sediments from the Work areas into local creeks or roads.

B. Contractor(s) shall be fully responsible for complying with all provisions of the applicable IDEQ Storm-Water control regulations regarding dewatering during all Work at the site.

1.4 SUBMITTALS

A. Submit information to J.R. Simplot on materials and methods proposed for drainage and sediment control measures at the Work sites at least five (5) days prior to commencing Work at the respective areas.

PART 2 EQUIPMENT AND PRODUCTS

2.1 EQUIPMENT

A. Provide for sufficient pumping equipment, piping and other appropriate equipment and materials at Site, prior to commencement of Work, such that operation of the dewatering and surface water and sediment control systems can be continuously maintained. All equipment shall be of good quality and in good working order.

2.2 MATERIALS

A. Straw bales, silt fences, straw wattles or other materials used to control erosion and sediment transport from excavations and other work areas shall be new and appropriately sized to serve the intended purpose. All straw bales, and straw wattles if used, shall be certified weed free.

B. As necessary, use 30- to 36-inch high silt fences including slats for stability.

C. Use onsite, soils with average selenium concentrations less than 2 mg/kg for containment berms as necessary.

D. If temporary culverts are required where access roads cross drainage ways or ditches, either galvanized corrugated metal pipes or corrugated high-density polyethylene pipes shall be used.

PART 3 EXECUTION

3.1 DEWATERING METHODS

A. Perform dewatering, as necessary, during all construction at the Site, such that water levels are maintained below the bottom of excavations.

B. Select methods of dewatering and arrangement of related piping systems that minimize release of materials from the immediate work area and that eliminate direct discharges to adjacent streams, and do not cause erosion or instability of the work site or adjacent areas.

C. All subsurface drainage from the FSPS area or downslope toe area shall be diverted into the sedimentation basin.

3.2 SURFACE WATER AND SEDIMENT CONTROL AND DIVERSIONS

A. Provide sedimentation control downstream of the Work areas during all construction activities as directed, to prevent release of pollutants from the site, and comply with the Storm-Water Pollution Prevention Plan for the site. The sedimentation basin and associated silt fence will be installed during the first phase of construction prior to regrading work at the FSPS pile.

B. Install silt fences as required, and where shown on the Drawings, with suitable posts and proper anchorage along the entire length of the silt fence, in accordance with the manufacturer's recommendations. For small drainage areas, 9-inch diameter straw wattles may be used in place of silt fences.

C. Provide temporary berms and other controls at the top of excavation slopes to prevent gullying of FSPS area surfaces from storm-water during construction. Protect all newly placed cover soil from uncontrolled runoff from uncovered pile surfaces using appropriate means, as directed.

D. Install straw bales with suitable driven steel anchors or rock buttresses to provide stability during construction. Brush matting from cleared vegetation may be used around stockpiles of the cover soils where possible.

E. Remove and dewater silt and sediment buildup behind silt fences, straw bales and temporary sedimentation control berms when sediment buildup reaches ¼ height of the structures as necessary during construction and near the end of construction. Following construction, the sediment control devices will be inspected monthly during spring runoff for 3 years and then annually. In the event that a major precipitation event occurs, additional inspections will be performed. Problems identified during inspection will be corrected as soon as accessible (i.e following weather events and when ground is adequately dry for safe equipment access).

F. Ensure that containment devices and sediment-control structures that are to remain through the spring runoff shutdown are stable at shutdown, as applicable.

END OF SECTION

Section 02200-Earthwork

EARTHWORK

PART 1 GENERAL

1.1 DESCRIPTION

A. This section describes the requirements for all earthwork associated with and required by the FSPS work. Earthwork includes common excavation, hauling of materials, placement and compaction of embankment fills, riprap and rock drainage materials including associated geotextiles, and final grading. The initial phase of construction in 2012 will consist of construction of the run-on and runoff ditches, peripheral access road and sedimentation basin along with all associated work. Major regrading and construction of the vegetation test plots will be performed in a second phase of construction in 2012.

B. Comply with all safety, dust and sediment control requirements.

1.2 RELATED SECTIONS

A. Section 01505 - Mobilization, Preparatory Work and Demobilization

B. Section 02130 - Surface Water and Sediment Control During Construction

1.3 SUBMITTALS

A. Submit to J.R. Simplot a description of proposed methods of excavation, compaction and hauling at least five working days prior to Site mobilization.

B. Submit to J.R. Simplot manufacturer's data on geotextiles and other materials, at least five working days prior to beginning the portion of the Work to which the item applies.

1.4 SAFETY

A. Shore, brace, or slope excavations, as necessary, in accordance with OSHA regulations to ensure worker safety, and to protect property from damage during construction.

B. Comply with the applicable occupational safety and health requirements of OSHA including work on steep slopes and the use of heavy equipment.

C. J.R. Simplot will be responsible for the health and safety of its own construction personnel and site visitors. Contractor shall be fully responsible for the health and safety of all its personnel on the Site, at all times, and shall take all necessary precautions to protect such health and safety, as applicable.

D. Provide first aid materials and equipment at the Site, as necessary, and coordinate with local medical facilities and identify local emergency phone numbers to supplement job site safety and first aid.

E. Comply with all Conda Health and Safety requirements and the site-specific Health and Safety Plan for Construction Activities.

1.6 DUST AND SEDIMENT CONTROL

A. Take adequate precautions to avoid dust emission resulting from earthwork as specified in Sections 01505 and 02130. Provide water trucks or other dust-control means during excavation of dry materials at the Site and at borrow areas.

B. Control release of sediment from excavated areas to limit sediment transport offsite, as specified herein and in Section 02130.

1.7 QUALITY CONTROL

A. Use an adequate number of skilled workers experienced in the type of work to be performed.

B. The services of appropriately qualified professionals will be employed to perform quality control testing for earthwork as specified herein. Agency Representatives may perform periodic quality assurance testing, and Contractor, as applicable, shall cooperate during such tests.

C. J.R. Simplot, or a third party geotechnical tester, will perform nuclear instrument testing of compacted soils and embankments in accordance with ASTM D2922 or sand-cone testing in accordance with ASTM D1556 to confirm in-place compacted density and moisture of embankment fill materials as compared with ASTM D698 (Standard Proctor Compaction Curve), at a frequency of one test, or more, per 5,000 cubic yards of compacted fill, with at least one test for each lift of material compacted in the toe fill area. Compaction tests for bedding and backfill around pipes and culverts shall be performed for each 40 linear feet of pipe or culvert placed and at least one compaction test shall be performed for compacted fill around each structure. A separate Standard Proctor Curve shall be used for different compacted soil types. The J.R. Simplot Company may perform sand-cone tests for compacted fill associated with the final graded and compacted materials, as necessary, to verify the accuracy of nuclear instrument equipment. Any area that fails to meet the compaction acceptance criteria shall be reworked, including moisture conditioning and re-compaction as necessary, until a subsequent test shows acceptable results.

D. Perform daily construction survey control, as needed, to ensure that the lines and grades of all excavations, embankments, and graded surfaces are in accordance with the design requirements.

E. Agency Representatives may perform periodic quality assurance monitoring. Contractor(s) shall cooperate, as required, in quality assurance monitoring, as applicable. This QA monitoring will include periodic verification testing for compaction, visual inspections and review of survey and other QC data.

PART 2 PRODUCTS

2.1 BACKFILL MATERIALS

A. For compacted backfill areas use native material from the excavation with low organic matter, and containing no wet, soft material, no rocks larger than 4 inches in diameter, and no frozen or deleterious materials.

B. For small diversions, sediment traps, or other embankments, use locally available granular material with no particles larger than 6 inches and no miscellaneous waste or other deleterious materials.

2.2 GRANULAR BEDDING, DRAINAGE GRAVEL AND GRAVEL SURFACING

A. Use a locally available chert or Wells Formation material from onsite borrow areas located on Simplot’s property, or imported sandy gravel material, having a maximum particle size of 1.5 inches with no more than 2 percent finer than the No. 200 sieve, by weight, for pipe bedding and backfill under and around pipes, manholes and structures.

B. Use a crushed or graded sandy gravel material for surfacing access roads in the FSPS area.

2.3 COVER SOILS

A. The materials used for the Dinwoody covers shall be combined topsoil, colluvium and fine-grained weathered Dinwoody. Coarse un-weathered Dinwoody materials shall not be used.

B. A portion of the topsoil, approximately 6-inches, removed initially from the soil borrow areas will be stockpiled at the borrow area sites along with cleared vegetation. These materials will be used for reclamation of the soil borrow areas.

2.4 GEOTEXTILE

A. Geotextile used as a material separation layer around drainage gravel, shall be a non-woven polyester or polypropylene material having a weight of approximately 8 to 10 ounces per square yard, a puncture strength of at least 110 pounds when tested in accordance with ASTM D-4833, a grab tensile strength of at least 200 pounds at an elongation of 50 percent, or less, when tested in accordance with ASTM D-4632 and a water flow rate of at least 110 gpm/sf when tested in accordance with ASTM D-4491. A Geotex 861, as manufactured by Propex Geosynthetics, or approved substitute, may be used for non-woven geotextile around drainage gravel. Geotextile for use under riprap and large rock shall be a non-woven material with a weight of approximately 14 to 16 oz/sy and a puncture strength of at least 210 pounds when tested in accordance with ASTM D-4833, and a grab tensile strength of at least 310 pounds at an elongation of 50 percent, or less, when tested in accordance with ASTM D-4632. A Geotex 1201, as manufactured by Propex, or approved substitute, may be used for non-woven geotextile under riprap and large rock.

B. Geotextile for silt fences shall be woven polypropylene material having a UV resistance of at least 90 percent when tested in accordance with ASTM D4355, a grab tensile strength of at least 120 pounds in both the machine and cross-machine directions, at elongations of 15 to 20 percent, when tested in accordance with ASTM D 4632. Silt fences shall have slats for stability during windy periods.

2.5 EROSION CONTROL MATERIAL

A. Permanent erosion control materials for use on final slopes shall be non-biodegradable turf reinforcement mats (TRMs). The TRMs shall have a polypropylene 3-D fiber matrix with a mass per unit area of 10 oz/sy and a tensile strength of 400x300 lbs/ft when tested in accordance with ASTM D-6818. A TRM shall be used in run-on and runoff ditches, where shown on the Drawings. A Landlok 450, as manufactured by Propex Geosynthetics, or approved substitute, shall be used. Anchors for TRMs shall be galvanized steel U-anchors as recommended by the TRM manufacturer.

B. A biodegradable erosion control mat (coconut or straw fiber) may be used between plots (in buffer zones).

C. Alternatively, a hydromulch with tackifier may be used for erosion control on construction areas, between the TRMs, and in ditches to be seeded.

2.6 GRAVEL SURFACING ON ACCESS ROADS, BENCHES AND RAMPS

A. Use onsite silty gravel materials, consisting of non-ODA material, for gravel surfacing. Material should have a maximum particle size of 1.5 inches and 2% to 10% fines passing the No. 200 sieve. Rex Chert or Wells Formation material may be used blended with fines to achieve the necessary binder materials.

2.7 RIPRAP, COARSE GRAVEL AND GROUTED RIPRAP

A. Riprap shall be a sound, durable angular rock material from local chert having a median D_{50} size of 12 inches and a maximum size of 18 inches. The minimum size of rock for use in riprap shall be 2 inches. The maximum dimension of rock shall be no greater than 2 times the least dimension.

B. Use coarse gravel in low-gradient portions of spillways, and elsewhere as directed, having a minimum size of 2 inches, a maximum size of 6 inches and a D_{50} size of 4 inches.

C. The saturated surface dry specific gravity of rock for use in riprap shall be at least 2.4, the sodium sulfate soundness loss shall be no greater than 2% and absorption shall be no greater than 5%.

D. Use large angular rock in the size range of approximately 12 to 36 inches for dissipation aprons. Base rock below the dissipation apron rock shall be a minus 12-inch to 2-inch rock.

PART 3 EXECUTION

3.1 EXCAVATION

A. Contractor shall conduct excavation operations in a manner that will allow continued free drainage of the immediately surrounding areas, to the extent possible. Excess water shall not be permitted to accumulate in excavations. Perform all necessary pumping required to maintain excavations in a dewatered condition.

B. All topsoil shall be stripped from the grubbed areas and stockpiled for later use on the cover as necessary.

C. Excavation at the FSPS pile and for ditches shall be excavated to the lines and grades shown on the Drawings, and as directed.

D. The allowed variation in specified lateral dimensions of the excavated prism for ditches from those shown on the Drawings shall not exceed minus 0.5 foot. Side slopes of the excavated ditches shall as designed and shall be no steeper than 2(h):1(v). Invert elevations of ditches shall be within plus or minus 0.1 feet from those designed, unless field conditions require variances. Grades of ditches shall be within plus 1.0 percent and minus 0 percent from design grades. Grades of runoff ditches shall be within plus 3 percent and minus 1 percent from design grades. Excavated slopes at the FSPS shall be as designed and local areas shall be no steeper than 3:1.

E. Temporary excavation slopes in soil borrow areas shall be no steeper than 0.5(h):1(v) for slopes of 4 feet or less. Soil borrow excavation slopes in excess of 4-feet high shall be no steeper than 1.5:1. Excavation of borrow soils shall be performed in a manner to prevent release of sediment from the areas. Temporary sedimentation ponds shall be used at borrow areas as designed and as directed.

F. Blasting of chert in rock borrow areas (if necessary) shall be performed in a safe manner in accordance with J.R. Simplot requirements and blast rock shall be contained onsite. Simplot’s blasting plan including all necessary regulatory, training and safety requirements is included as an attachment to the documents. All blasting, if necessary, will be performed by Simplot’s experienced Smoky Canyon Mine blasting crew. Rock separation grizzlies and crushing operations (if used) shall be contained within the borrow areas and shall be in accordance with J.R. Simplot requirements. Fines from rock borrow areas shall be prevented from offsite release.

G. Dispose of excess or unsuitable excavated materials from the borrow area or overburden excavations as directed.

3.2 EXCAVATION OF BORROW, STOCKPILING AND DISPOSAL OF MATERIALS

A. Excavation of materials from Dinwoody borrow areas shall be performed to prevent water pooling or erosion to adjacent land.

B. The sedimentation basin and run-on controls associated with each soil borrow area shall be constructed, in accordance with the Drawings, prior to beginning removal of soils from each borrow area.

C. The upper 6 inches of topsoil shall be excavated first for stockpiling at the borrow area with temporary erosion controls placed at each stockpile. Temporary erosion controls will include brush matting from cleared vegetation, silt fence, straw wattles or straw bales.

D. Haul the combined weathered Dinwoody and topsoil/colluvial soils to the FSPS area for placement on the study plots.

E. Use suitable hydromulch with added organic materials and seed to reclaim soil borrow areas as directed and as specified in Section 02900.

F. Materials excavated from the borrow areas, that are not to be used for cover soils or reclamation, shall be stockpiled at a location to be determined or disposed offsite as directed and approved by the Agencies and in accordance with applicable State and local government regulations.

G. Drainage ditches within the borrow areas shall be constructed from the down-gradient drainage area of each soil borrow area to the associated sedimentation basin inlet. Place TRM in the inflow ditch from the down-gradient portion of the borrow areas into the sedimentation basin as directed. Run-on control ditches around each borrow area shall be constructed as designed with discharge bypassing the sedimentation basins and combining with discharges from the sedimentation basins.

H. Sedimentation basins, along with associated outlets and spillways, shall remain following regrading and reclamation of each borrow area until vegetation is re-established in that particular area, and the Agencies have determined that the sedimentation basins can be removed.

3.3 UNCOMPACTED BACKFILL AND BACKFILL COMPACTED BY EQUIPMENT TRAVEL

A. Materials placed for cover soil and growth medium shall be placed in uniform lifts.

B. Compaction will not be required for cover soil other than that achieved by the normal travel of placement and grading equipment. Upper growth medium soils may require minor scarification prior to seeding as specified in Section 02900.

C. Place excavated overburden material in relatively uniform lifts of approximately 1.5 to 2 feet. Compaction only by equipment travel will be required for overburden material placed as fill west of the pile that will not underlie vegetation test sections. This shall be determined by a test section using proposed equipment to be used in the program, which will determine the placement and equipment travel procedures necessary to achieve acceptable stability of the fill. This will be performed in the second phase of construction in 2012.

D. No soil or ODA material shall be placed in fill sections that is too wet or is frozen. Such materials shall be properly scarified and air dried or thawed as necessary to achieve acceptable conditions prior to placement as fill.

3.4 COMPACTED BACKFILL

A. Prepare the existing surfaces, upon which compacted soil will be placed, by removal of all organic, frozen material and other unsuitable material and by grading the surfaces so that no irregular depressions or projections exist to achieve an acceptable surface upon which the compacted embankments may be placed. Standing water and excess moisture shall be removed from surfaces prior to placement of additional compacted material.

B. Fill material for the embankments shall be placed and compacted to the lines and grades shown on the Drawings, or as directed in the field using appropriate slope stakes or other controls. Placement of fill shall only be done on scarified, moist surfaces of previously placed fill or suitable foundation material. Water shall be added, as necessary, to each layer of fill and the material blended as necessary prior to compaction. Wet portions of materials shall be spread and air dried, as necessary, to achieve proper moisture content for compaction. The fill material shall typically be within approximately plus or minus 2.5% of the optimum moisture content. The fills shall be built in essentially horizontal layers, with a slight surface slope to promote positive drainage. No fill shall be placed on unstable soil, or soil that has water ponded on it. All lifts of fill material shall be compacted to the full width of the lift, as indicated by slope stakes. Fill material shall not be placed during freezing or extremely wet weather.

C. Fill material shall be placed in horizontal layers approximately 8 to 12 inches in loose thickness. The minimum compaction requirements for all compacted fill shall be at least 90 percent of the laboratory maximum dry density as determined by the Standard Proctor Density Test (ASTM D-698). Compact embankments to at least 90 percent of the maximum dry density as determined by ASTM D-698.

D. Compacted backfill around pipes and manhole structures shall be placed in loose lifts of 7 to 9 inches and compacted to at least 95 percent of the maximum dry density as determined by the Standard Proctor Density Test (ASTM D-698).

Backfill shall be placed and compacted equally on each side of the pipes and vertical structures to avoid displacement of the pipes during backfilling.

E. Embankment dimensions shall be within minus 0.5 foot and plus 1.0 foot from those shown on the Drawings. The minimum dimensions, and depth, of the sedimentation pond will be achieved with a tolerance of minus 0 and plus 1.0 ft. An as-built survey will be completed for the structure to verify capacity.

3.5 FINAL GRADING AND PLACEMENT OF EROSION CONTROL DEVICES

A. Surfaces shall be graded at a relatively uniform slope so that no areas of pooled water or localized depressions exist.

B. Turf reinforcement mats placed shall have at least 2 anchors per square yard, and the up-gradient end of the TRMs shall have the anchors placed at 12-inches on center.

C. Erosion control straw wattles on regraded surfaces, straw bales and silt fences shall be installed in accordance with the Drawings and with manufacturer’s recommendations.

3.6 PLACEMENT OF GEOTEXTILE

A. Sections of geotextile shall be overlapped by at least 18 inches vertically on the slope with no overlaps parallel to the side slopes (horizontal). On long reaches of ditches, where horizontal overlaps become necessary, such overlaps shall be shingled in the downstream direction at least 24 inches. Optionally, sections of geotextile may be sewn together in accordance with the manufacturer's recommendations for a "J" stitch.

B. All geotextile shall be adequately anchored as shown on the Drawings and all geotextile shall be covered with soil, or riprap.

C. Place geotextile for silt fences with seams sewn at the supports and with adequately anchored bases in accordance with the manufacturer's recommendations.

3.7 RIPRAP

A. Riprap shall be placed on prepared subgrade at ditch outfalls or in runoff ditches to the dimensions and thickness shown on the Drawings. Riprap shall be placed to provide a stable, interlocking mass of rock without tendency to slide or produce movement of upper rock. Use non-woven geotextile, as specified above in Part 2.4, beneath the riprap.

END OF SECTION

Section 02610-Piping

PIPING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section covers the requirements materials and installation for culverts and half-round pipe at the Site.

1.2 RELATED SECTIONS

A. Section 01505 – Mobilization, Demobilization and Preparatory Work

B. Section 02130 – Surface Water and Sediment Control During Construction

C. Section 02200 – Earthwork

1.3 REGULATORY REQUIREMENTS

A. Comply with the requirements of all applicable local, State, or Federal codes regarding clearing and disposal of related debris.

1.4 QUALITY CONTROL

A. Perform all quality control required for pipe, culverts and at the Site including survey control during installation to verify design lines and grades, and quality control required for associated concrete, bedding and compacted backfill.

1.5 SUBMITTALS

A. Provide material information and details of all piping and equipment.

B. Submit all material certifications verifying compliance with appropriate ASTM specifications. Submit material guarantees where required as applicable.

PART 2 EQUIPMENT AND PRODUCTS

2.1 EQUIPMENT

A. Contractor shall use appropriate and sufficient equipment in the installation of all pipe, supports, connections and drop inlets at the Site.

2.2 PIPE PRODUCTS

A. Use heavy duty corrugated high-density polyethylene pipe substitute to those manufactured by Advanced Drainage Systems, or approved equal. Corrugated polyethylene pipe and fittings shall be in accordance with ASTM F-405.

B. Use half-round, heavy duty poly-coated, corrugated metal pipe (CMP) with top edge angle for spillways in accordance with ASTM A-762. The pipe shall be 12 gauge and shop poly-coated.

C. Use reinforced concrete cutoff walls at the beginning and end of each reach of half-round pipe and use intermediate steel bar anchors along the slopes, as designed and directed.

D. Alternatively, use half-round heavy-duty, corrugated HDPE, in accordance with ASTM D-3350, or polypropylene pipe for the internal ODA runoff ditches, with appropriate end and intermediate anchors. The alternative plastic half-round pipe shall have internal and external corrugations and shall be ADS N-12 water tight, high-stiffness pipe, or approved substitute. The plastic pipe sections shall have sufficient rigidity to be self-supporting in beam strength with simple end supports. The amount of anchors required for ½-round HDPE pipe shall be double that required for ½-round CMP.

E. Use galvanized CMP in accordance with ASTM A-762, 14 gauge, for culverts as necessary. Alternatively, use equivalent heavy-duty corrugated HDPE pipe for culverts of the same size designed for CMP culverts.

F. Use standard pipe fittings for drainage applications as recommended by the pipe manufacturer(s).

2.3 SUPPORTS AND ANCHOR BLOCKS

A. Use 1-inch diameter, epoxy-coated steel anchor bars, ASTM A-36 or better, to secure the half-round CMPs, or alternative half-round corrugated HDPEs, in place as designed.

PART 3 EXECUTION

3.1 INSTALLATION OF PIPE

A. Install all pipe to the lines and grades designed and in accordance with manufacturer’s recommendations.

B. Place all buried pipe in pipe bedding under each pipe and to the top of each pipe and place compacted backfill in the trenches to final grade. Place pipe bedding to at least 3 inches over the top of buried plastic pipes. Compact backfill around all pipe as specified in Section 02200.

C. Place compacted fill on each side and over the top of culvert pipe as designed with at least 12 inches of compacted fill over the top of the culvert pipes.

D. Place riprap at the outlet of each culvert extending at least 1-foot underneath the end of the culvert and to the length and width indicated on the Drawings and as directed.

END OF SECTION

Section 02900-Vegetation Establishment

VEGETATION ESTABLISHMENT

PART 1—GENERAL

1.1 DESCRIPTION

A. This section covers vegetation establishment for the FSPS area. The seeding required for embankments associated with the ditches, perimeter road and sedimentation basin embankments will be performed during the initial phase of construction, with the remainder of vegetation establishment performed during the second phase of construction in 2012.

1.2 RELATED WORK

A. Section 02130—Surface Water and Sediment Control During Construction

B. Section 02200—Earthwork

C. Storm-Water Pollution Prevention Plan

1.3 QUALITY CONTROL

A. Certification of seed mixes and purity and associated hydroseed components shall be obtained.

B. Review of seeding success shall be performed approximately 10 to 12 months following initial hydroseeding

PART 2—MATERIALS

2.1 COVER SOIL

A. The Dinwoody Formation cover soil shall be, friable, natural loam, colluvium and weathered Dinwoody having an organic content of at least 2 percent, and shall be reasonably free of large clay lumps or rocks larger than 4 inches, or any other material that would inhibit the establishment of vegetation.

2.2 SEED MIX

A. Use the non-selenium uptake seed mix identified in the FSPS Work Plan.

2.3 MULCH

A. Mulch shall be certified weed free small grain straw or native hay. Composted manure and hydromulch shall be certified weed free.

B. Hydraulically applied mulch shall consist of suitable materials to cover and hold the seed in contact with the topsoil, while allowing the penetration of seedlings as they germinate and grow.

PART 3—CONSTRUCTION REQUIREMENTS

3.1 PREPARATION

A. Prepare the areas to be seeded as necessary with scarification prior to cover soil placement.

3.2 COVER SOIL

A. Cover soil to be used at the site shall be removed from its source to the actual depth of the topsoil, colluvium and weathered Dinwoody layers

B. Cover soil shall be spread as shown on the Drawings. Cover soil shall be fine graded to a firm even surface, matching existing slopes, with no lumps or stones present. The cover soil shall be prepared to a good condition, not muddy or hard, and shall be scarified to a friable condition if it has hardened prior to seeding.

C. Areas where cover soil has been spread shall be protected against erosion until erosion controls are in place or until hydroseeding is complete in that area.

3.3 APPLICATION OF SEED, FERTILIZER AND MULCH

A. Field seed all cut-and-fill slopes and along the run-on and runoff control channels, all sedimentation basin side slopes and all areas disturbed by construction. Benches, dam crests, roadways specified to receive gravel surfacing, riprap, grouted riprap drainage ditches will not require application of seed, fertilizer and mulch. Seed areas to receive turf reinforcement mats prior to placement and anchorage of TRMs.

B. Field seeding shall be accomplished using a hydromulch with seed method, using equipment designed for such work. Seed and water shall be uniformly applied to the areas scheduled to be seeded. Fertilizer, water, and hydraulic mulch shall be thoroughly mixed and uniformly applied to seeded areas. Hydraulic mulch shall be applied at a rate of at least 1 ton per acre.

3.4 EROSION CONTROL

A. Use downed trees and removed vegetation on exterior slopes of embankments where directed, for erosion control.

B. Use turf reinforcement mats in drainage ditches and on the regraded and covered ODA where shown on the Drawings and in accordance with Specification Section 02200.

END OF SECTION

SECTION 03300: CONCRETE AND GROUT

CONCRETE AND GROUT

PART 1 GENERAL

1.1 WORK INCLUDED

A. Furnish all labor, tools, and equipment for the construction of plain and reinforced concrete as shown on the Drawings and specified. Adhere to the requirements of American Concrete Institute (ACI) 301, Specifications for Structural Concrete, latest edition.

B. Structural concrete will include the reinforced concrete cutoff walls, base slabs, footings, structures and all miscellaneous concrete required at the Site. This includes cast-in-place concrete and precast concrete.

C. Steel and fiber reinforcement for reinforced concrete are included in this section.

1.2 SUBMITTALS

A. Submit product data for admixtures, ready-mix concrete designs, curing compounds, form release agents, form ties, bonding agents, grouts, coatings and all other admixtures proposed.

B. Submit materials reports for cement and mill test reports for steel reinforcement for all structural concrete.

C. Submit shop drawings for steel reinforcement details to Engineer at least 14 days prior to fabrication of the materials.

1.3 QUALITY CONTROL

A. Provide quality control for all concrete placements including air entrainment, temperature, slump and cylinders for compressive strength testing at 7 and 28 days. At least four cylinders shall be prepared for each pour for subsequent compressive strength testing.

B. Use adequately skilled workers in the placement of all concrete and verify dimensions and steel reinforcement placement.

C. Provide shop quality control testing data for all precast concrete to verify compressive strength and quality of concrete.

PART 2 PRODUCTS

2.1 CEMENT

A. Cement shall be air-entrained Portland Cement in accordance with ASTM C-150, Type II, and ASTM C-260 for air entrainment.

2.2 AGGREGATE

A. Fine Aggregate: Fine aggregate shall consist of hard, strong, durable particles conforming to the requirements of the Standard Specifications for Concrete Aggregates, ASTM Designation C-33.

B. Coarse Aggregate: Coarse aggregate shall conform to the requirements of Standard Specifications for Concrete Aggregates, ASTM Designation C-33.

2.3 WATER

A. Water shall be clean and free of injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or steel. Mixing water for concrete which will contain aluminum embedment, including that portion of the mixing water contributed in the form of free moisture on the aggregates, shall not contain deleterious amounts of chloride ion.

B. Unless otherwise permitted or specified, the concrete shall be proportioned and produced to have a slump of four (4) inches or less if consolidation is by vibration. The slump shall be determined by the “Test for Slump of Portland Cement” ASTM C-143.

2.4 ADMIXTURES

A. Admixtures to be used in concrete shall be subject to prior acceptance by the Engineer or it’s Representative. The admixture shall maintain the same composition and performance throughout the work as the product used in the concrete proportioned established in accordance with ACI 211. Admixtures containing chloride ions shall not be used in prestressed concrete or concrete containing aluminum embedments.

B. Entrained air shall be added to all concrete in accordance with ASTM C-260 in the amount to achieve 6% entrained air by volume for concrete having a maximum size aggregate of ¾-inch and in the amount to achieve 4.5% entrained air by volume for concrete having a maximum size aggregate of 1.5 inch.

C. Water Reducing, Set-Controlling Admixture: The Contractor shall use a water-reducing, set controlling concrete. A water-reducing admixture shall be used in all concrete and shall conform to ASTM Designation C-494, specifically Types A, B, C, D, and E.

D. Finely Divided Mineral Admixtures: Mineral admixtures shall be limited to fly ash conforming to ASTM Specification C-618, Type F.

E. Pigment: Pigment shall be added to the concrete to meet the color specifications of the Owner, if directed.

2.5 BATCHING

A. Measuring and batching of materials shall be done at a batching plant for ready-mix truck delivery.

B. Portland Cement: Either sacked or bulk cement may be used. No fraction of a sack of cement shall be used in a batch of concrete unless the cement is weighed. Bulk cement shall be weighed on scales separate and distinct from the aggregate hopper or hoppers. Batching shall be such that the accuracy of batching shall be plus or minus one percent of the required weight.

C. Water: Unless water is to be weighed, the water-measuring equipment shall include an auxiliary tank from which the measuring tank shall be filled. In lieu of the volume method, the Contractor will be permitted to use a water metering device.

D. Aggregates: Aggregates shall be handled from stockpiles or other sources to the batching plant in such a manner as to secure a uniform grading of the material. Aggregates that have become segregated, or mixed with earth or foreign material, shall not be used. Batching shall be so conducted as to result in the weights of material required for each type aggregate within a tolerance of two percent (2%).

2.6 COMPRESSIVE STRENGTH

A. Structural Concrete: Structural concrete compressive strength requirements consist of a minimum strength which must be obtained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days. The 28-day compressive strength shall be at least 4,000 psi.

B. The mix shall be designed for strengths at least 15% in excess of this minimum. The net water cement ratio of the concrete shall not exceed 0.45 by weight. Typically, a minimum of 6.5 sacks of cement per cubic yard of concrete shall be used for 4,000 psi concrete. Maximum aggregate size shall be 3/4" for concrete in cutoff walls, structures and slabs. Concrete used in large thrust-anchor blocks may have a maximum aggregate size of 1.5 inches.

C. Sampling and curing shall be in accordance with ASTM C-192, and testing shall be in accordance with ASTM C-39. Slump shall be between 2" and 4" when placed.

D. Non-Structural Concrete: Non-structural concrete for fence posts, settlement monuments and miscellaneous concrete shall have a minimum 28-day compressive strength of at least 2,000 psi.

E. Testing: Concrete testing shall be done by a qualified independent testing laboratory as approved by the Engineer and Owner. Make 4 cylinders for each pour and each pour shall record the field slump and air content.

2.7 GROUT

A. Use a flowable sand:cement grout for use in grouted riprap having a 28-day compressive strength of at least 2,000 psi. Use Type V Cement for all grout in accordance with ASTM C-150, and clean sand in accordance with ASTM C-33. Grout for use in joints and gaps of articulated concrete block (ACB) mats, if used, shall have a 28-day compressive strength of at least 4,000 psi as required by the Armortec/Contech specifications for Amorflex ACB mats.

B. Mortar shall be composed of Portland Cement, sand, and water proportioned and mixed as specified in this section. Mortar shall be furnished and placed in recesses and holes, on surfaces, under structural members, and at other locations specified in these specifications; the special provisions are shown on the plans.

C. The maximum size of sand shall not be larger than ¼-inch or 1/2 the size of the recess, holes or spaces where the mortar is to be placed. The mortar shall contain only enough water to permit placing and packing. High-range water reducers, super-plasticizers, may be used to increase flowability of grout for grouted riprap.

2.8 REINFORCEMENT

A. Use new deformed steel reinforcement in accordance with ASTM A-615, Grade 60.

B. Use monopolymer polypropylene fibrillated fiber with a length of 1.5 to 2 inches and a tensile strength of at least 70,000 psi where fiber reinforcement is indicated on the Drawings. Alternatively, use a polyolefin fiber having a similar length and tensile strength.

2.9 ALTERNATIVE PRECAST CONCRETE

A. As an alternative to cast-in-place concrete shown on the Drawings, precast concrete may be used meeting the same strength and serviceability requirements specified herein. Comply with all requirements of ACI 318, Building Code Requirements for Structural Concrete, Chapter 16 Precast Concrete. Use Grade 60 deformed steel reinforcement in precast concrete, ASTM A-615, minimum.

B. Provide all shop drawings and certifications for review and approval at least 7 days prior to precast concrete production.

C. All precast concrete structures shall be installed to the same tolerances as the cast-in-place concrete structures designed.

PART 3: EXECUTION

3.1 FORMS

A. The concrete forms shall be constructed to the lines and dimensions as shown on the detailed drawings and shall be of acceptable material and adequately braced and tied to support all of the loads and pressures of the wet concrete without distortion or leaks, and which will produce a smooth, even surface.

B. The form facing material shall produce a smooth, hard, uniform texture on the concrete. It may be plywood, tempered concrete- form-grade hardboard, metal, plastic, paper, or other approved material capable of producing the desired finish.

3.2 REINFORCEMENT INSTALLATION

A. Install steel reinforcement as shown on the Drawings to a tolerance of plus or minus ¼ inch from the dimensions shown, secure and tie as necessary.

B. Include fiber reinforcement in the concrete mix for all cutoff walls and where shown on the Drawings so that the fibers are well distributed throughout the mix.

3.3 PLACEMENT

A. Prior to pouring the concrete, the Contractor shall remove all trash, pieces of wood, or other debris, and shall wet areas in which concrete is to be poured prior to concrete placement.

B. Placement shall conform to ACI 301, Chapter 8 "Placing," ACI 306 "Recommended Practice for Cold Weather Concreting," and ACI 305 "Recommended Practice for Hot Weather Concreting." No concrete shall be placed until all formwork, reinforcement, installation of parts to be embedded, bracing of forms, and preparation of surfaces involved in the placing have been approved by the Engineer/Representative. No concrete shall be placed in water, except with the written permission of the Engineer; the method of depositing the concrete shall be subject to his approval. All surfaces of forms and embedded materials that have become encrusted with dried mortar or grout from concrete previously placed shall be cleaned of all such mortar or grout before the surrounding or adjacent concrete is placed. Immediately before placing concrete, all surfaces upon or against which the concrete is to be placed shall be free from standing water, mud, debris, or loose materials. The surfaces of absorptive materials against or upon which concrete is placed shall be moistened thoroughly so that moisture will not be drawn from the freshly placed concrete. The concrete shall be placed by equipment which will prevent segregation or loss of ingredients. The stream of concrete shall not be allowed to separate by permitting it to fall freely over rods, spacers, or other embedded materials.

C. Concrete shall be poured in continuous layers of approximately 12 inches and the total elapsed time between placing of successive layers shall not exceed 30 minutes.

D. All wood blocking, spreaders, and screens shall be removed as the concrete is poured and before the concrete sets.

3.4 CONSTRUCTION JOINTS

A. The location of all construction joints will be subject to the acceptance of the Engineer’s Representative. The surface of all construction joints shall be thoroughly cleaned and all latency and standing water removed. Clean aggregate shall be exposed by abrasive blast cleaning. Wire brushing and air water jets may be used while concrete is fresh provided results are equal to abrasive blast cleaning. Construction joints shall be keyed at right angle to the direction of shear. Except where otherwise shown on the plans, keyways shall be at least 1-1/2" in depth over at least 25% of the area of the section.

3.5 CURING AND PROTECTION

A. Beginning immediately after placement, concrete shall be protected from premature drying, excessively hot or cold temperatures, and mechanical injury, and shall be maintained with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete, at least 7 days. The materials and methods of curing shall be subject to acceptance by the Engineer’s Representative.

B. Cold Weather: When the mean daily outdoor temperature is less than 40° F, the temperature of the concrete shall be maintained between 50 and 70° F for the required curing period. When necessary, arrangements for heating, covering, insulation, or housing the concrete work shall be made in advance of placement and shall be adequate to maintain the required temperature without injury due to concentration of heat. Arrangements for covering and protection of concrete shall be made if air temperatures are expected to drop below 32° F at any time during a 7-day curing period. Combustion heaters shall not be used during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.

C. Hot Weather: When necessary, provision for windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering with a light colored material shall be made in advance of placement, and such protective measures shall be taken as quickly as concrete hardening and finishing operations will allow.

D. Protection from Mechanical Injury: During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Self supporting structures shall not be loaded in such a way as to overstress the concrete.

3.6 PRECAST CONCRETE PLACEMENT

A. Place all precast concrete to the lines and grades shown on the Drawings for concrete drop inlets, manholes and structures. The same tolerances used for cast-in-place concrete shall be maintained in the final placement tolerances for all precast concrete.

B. Use care in handling precast concrete to avoid damage to the concrete during placement. Any damaged areas shall be repaired as necessary using cement mortar or dry pack.

C. Alternative articulated concrete block (ACB) mats and grout, used in place of grouted riprap, shall be installed in accordance with the

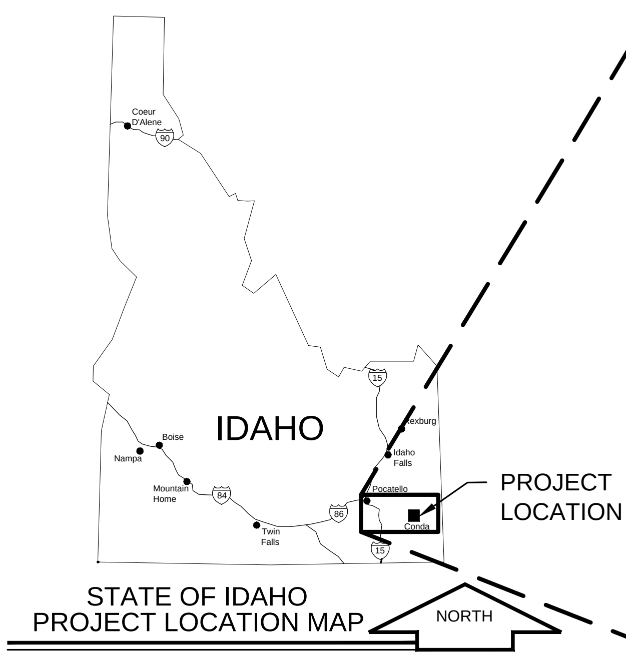
END OF SECTION

CONSTRUCTION DRAWINGS

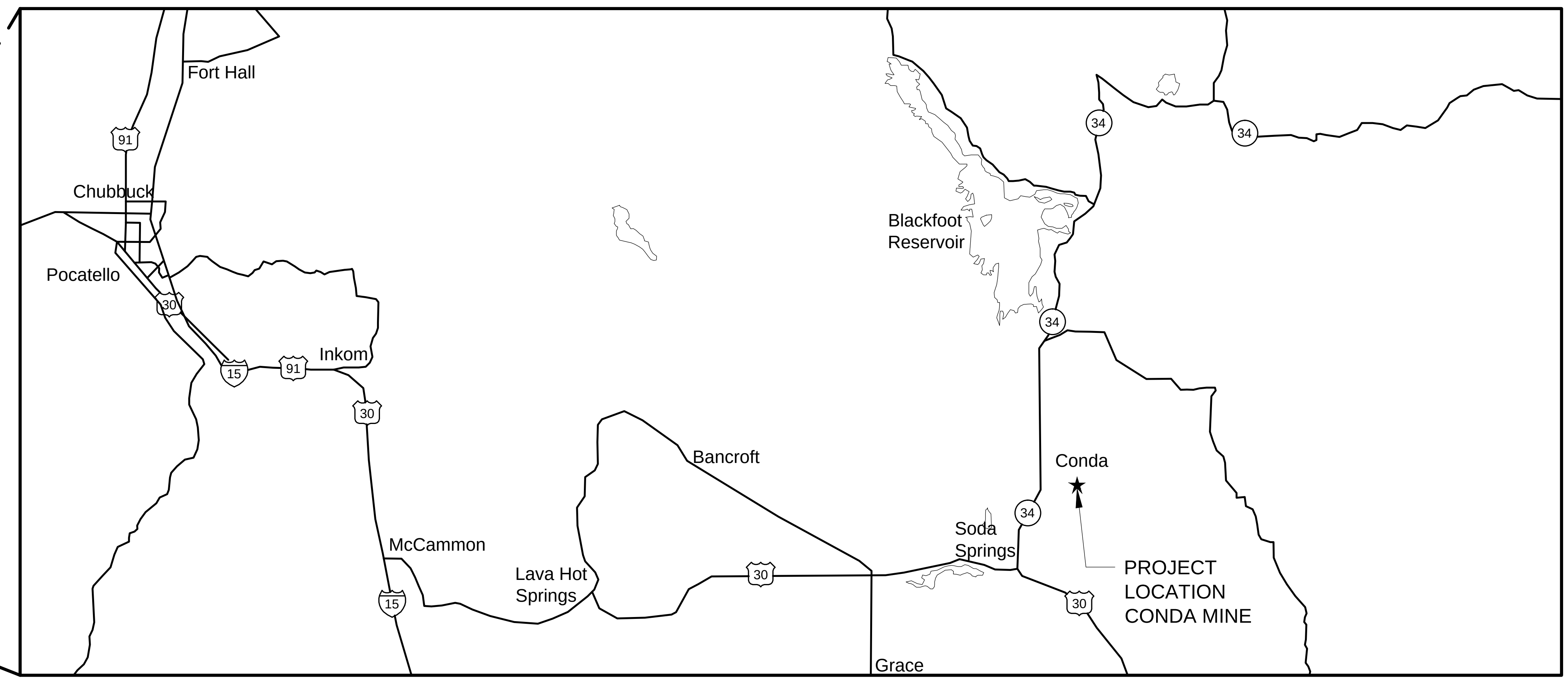
J.R. SIMPLOT COMPANY

CONDA MINE SITE

FIELD SCALE PLANT UPTAKE PILOT STUDY



STATE OF IDAHO
PROJECT LOCATION MAP
NOT TO SCALE



PROJECT VICINITY MAP
NOT TO SCALE

ORIGINAL SIGNED BY: JOHN H. RAHE

PROFESSIONAL ENGINEER
REGISTERED
6984
STATE OF IDAHO
JOHN H. RAHE

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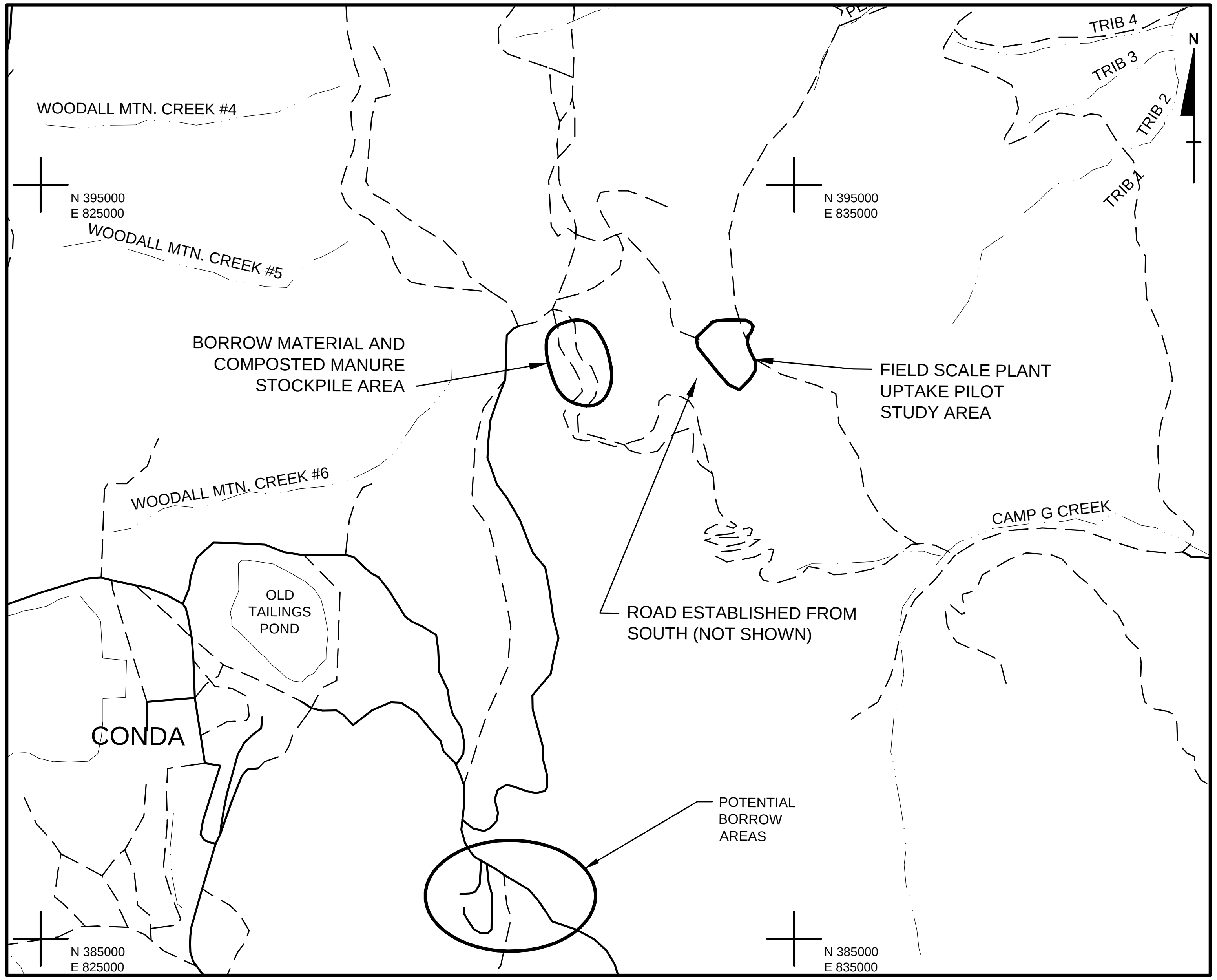
ISSUE FOR CONSTRUCTION
(26JULY2012)

SHEET
G40

DRAWING INDEX:

SHEET NO.	SHEET TITLE
G40	PROJECT TITLE SHEET AND LOCATION MAP
G41	GENERAL PLAN, GENERAL NOTES AND DRAWING LIST
G42	PILOT AREA HORIZONTAL AND VERTICAL CONTROL PLAN
C40	PILOT AREA REGRADING PLAN
C40.1	PLAN OF TEST PLOTS ON EAST SIDE SLOPE (NOT ISSUED FOR INITIAL WORK)
C41	TYPICAL SECTIONS AND DETAIL (NOT ISSUED FOR INITIAL WORK)
C42	WEST AND NORTH RUN-ON AND RUNOFF DITCH PROFILES
C43	EAST RUN-ON/RUNOFF CONTROL DITCH PROFILE
C44	DRAINAGE SYSTEM - SECTIONS AND DETAILS
C44.1	DRAINAGE SYSTEM - SECTIONS AND DETAILS
C45	SEDIMENTATION BASIN PLAN, SECTIONS AND DETAILS
C46	SOIL BORROW AREA PLAN
C47	SOIL BORROW AREA TYPICAL SECTIONS AND RUN-ON/RUNOFF CONTROL DITCHES
C48	SOIL BORROW AREAS SEDIMENTATION BASIN PLANS
C49	EROSION CONTROL DETAIL - SILT FENCES
C50	EROSION CONTROL DETAIL - FABRIC ROLLS - STRAW WATTLES AND STRAW BALES
REFERENCE 1	SIMPLOT ACCESS ROAD AS-BUILT AND PROPOSED PLAN
REFERENCE 2	SIMPLOT ACCESS ROAD AS-BUILT SECTIONS
REFERENCE 3	SIMPLOT ACCESS ROAD PROPOSED SECTIONS
REFERENCE 4	SIMPLOT ACCESS ROAD PROPOSED PROFILE



GENERAL PLAN

SCALE

1000 0 1000 FEET

GENERAL NOTES AND SPECIFICATIONS:

1. ALL CONSTRUCTION SHALL CONFORM TO THESE PLANS AND SPECIFICATIONS, AND APPROVED DESIGN CHANGES DURING CONSTRUCTION.
2. EXISTING MAPPING IS BASED ON PRIOR SURVEYS. ADDITIONAL CONTROL POINTS WILL BE PROVIDED AS NECESSARY FOR ALL SITE WORK.
3. SITE ACCESS WILL BE FROM A ROAD DEVELOPED FROM THE SOUTH.
4. COMPACTION OF REGRADED FILL AREAS ON THE PILE WILL BE PERFORMED ONLY THROUGH EQUIPMENT TRAVELBASED UPON A METHOD SPECIFICATION TO BE DEVELOPED. THE EMBANKMENTS FOR THE ROADS AND DITCHES SHALL BE COMPACTED TO AT LEAST 90% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 (STANDARD PROCTOR) WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT, AND THE EMBANKMENTS FOR THE SEDIMENTATION BASIN AT THE FSPS SHALL BE COMPACTED TO AT LEAST 95% OF STD. PROCTOR WITHIN 2% OF OPTIMUM MOISTURE.
5. PLACE SILT FENCE AND STRAW WATTLES (9") AND OTHER BMP CONTROLS AS NECESSARY TO MINIMIZE RUNOFF AND SEDIMENT TRANSPORT FROM THE SITE. ALL BMPs, INCLUDING THE SEDIMENTATION BASIN, WILL BE INSTALLED AT THE SITE PRIOR TO SITE REGRADING. USE OF TREES AND BRUSH REMOVED FOR SITE CLEARING SHALL BE USED ON REGRADED SLOPES FOR EROSION CONTROL AS DIRECTED.
6. CONTINUOUS DUST CONTROL MEASURES WILL BE IMPLEMENTED DURING DRY OR WINDY WEATHER.
7. EXPOSE AND VERIFY LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES OR OTHER FEATURES, IF ANY, PRIOR TO CONSTRUCTION ACTIVITIES.
8. ALL ADJACENT PUBLIC AND PRIVATE LAND WILL BE PROTECTED FROM DAMAGE AS NECESSARY DURING CONSTRUCTION.
9. ALL WORK WILL BE PERFORMED IN ACCORDANCE WITH IDEQ, EPA AND BLM REQUIREMENTS.
10. GRADING SHALL BE PERFORMED AS DESIGNED WITH A TOLERANCE OF NO STEEPER THAN 2.8:1 AND NO FLATTER THAN 3.2:1 ON SIDE SLOPES.
11. DRAINAGE DITCHES AND BASINS SHALL BE CONSTRUCTED TO AT LEAST THE DESIGNED DIMENSIONS OR LARGER.
12. GRADES OF DITCHES, CULVERTS AND BASINS SHALL BE WITHIN 0.5% FLATTER THAN DESIGNED AND NO MORE THAN 2% STEEPER THAN DESIGNED.
13. HEAVY NON-WOVEN GEOTEXTILE FOR USE UNDER RIPRAP SHALL BE A GEOTEX 1201 AS MANUFACTURED BY PROPEX GEOSYNTHETICS, OR APPROVED SUBSTITUTE. ALL GEOTEXTILE SHALL BE ANCHORED WITH AT LEAST 6" COVER AND SHALL HAVE 12" WIDE (MIN.) RUNOUTS AND 6" DEEP ANCHOR TRENCHES TO FINAL GRADE.
14. TURF REINFORCEMENT MAT (TRM) SHALL BE A LANDLOK 450, AS MANUFACTURED BY PROPEX, OR APPROVED SUBSTITUTE AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. CORRUGATED METAL PIPE SHALL BE IN ACCORDANCE WITH ASTM A-762, 14 GAUGE. ALTERNATIVELY HEAVY DUTY, CORRUGATED HDPE PIPE MAY BE USED IN ACCORDANCE WITH ASTM D-3350. ALL CULVERT PIPES SHALL HAVE 12" MINIMUM COVER AND HDPE PIPE WILL HAVE 18" MINIMUM COVER UNDER ROADS, PIPE SHALL HAVE SAND-GRAVEL BEDDING TO PIPE HORIZONTAL CENTERLINE. PIPE COVER WILL BE VERIFIED WHERE HEAVY EQUIPMENT TRAVEL IS ANTICIPATED OVER THE PIPES.
16. GRAVEL FOR USE ON PERIMETER ACCESS ROADS SHALL BE MINUS 1.5" MATERIAL WITH AT LEAST 2 TO 10 PERCENT FINES AS BINDER AND SHALL BE COMPACTED TO AT LEAST 90% OF THE MDD AS DETERMINED BY ASTM D-698.

REFERENCE	NO.	REVISIONS	BY	DATE	NO.	REVISIONS	BY	DATE
					3	ISSUED FOR CONSTRUCTION	RPS	7/12
					2	ISSUED FOR INITIAL DRAINAGE CONTROLS	RPS	5/12
					1	ISSUE FOR FINAL AGENCY REVIEW	RPS	3/12
					0	ISSUE FOR REVIEW	RPS	10/11

ORIGINAL SIGNED BY: JOHN H. RAHE

PROFESSIONAL ENGINEER REGISTERED 6984 STATE OF IDAHO JOHN H. RAHE

July 2012

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FORMATION ENVIRONMENTAL

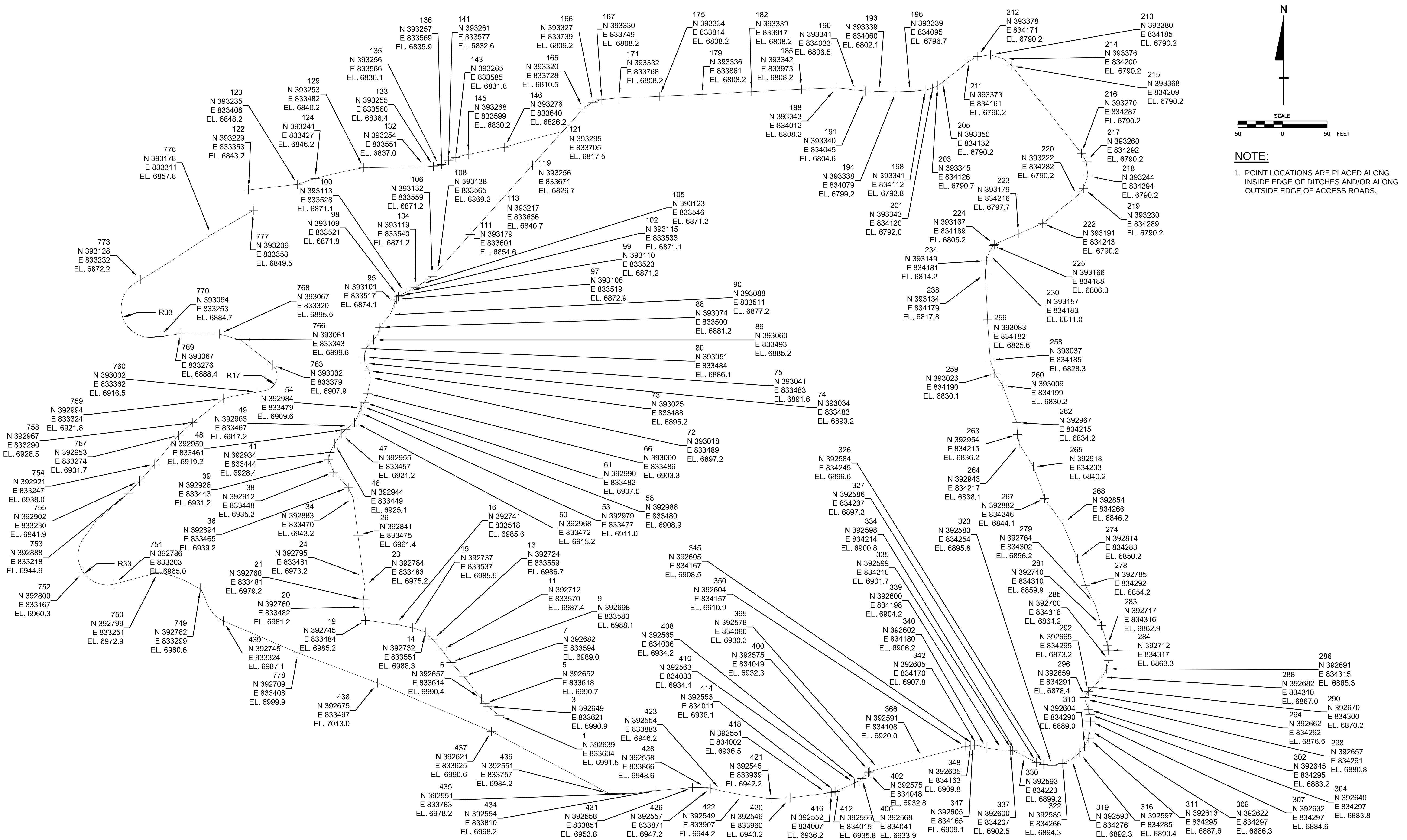
DESIGNED BY:	SCG/JHR
DRAWN BY:	SCG
CHECKED BY:	JHR
APPROVED BY:	RPS
FILE NAME:	009-001-G41 .DWG

J.R. SIMPLOT COMPANY

FIELD SCALE PLANT UPTAKE PILOT STUDY

GENERAL PLAN, GENERAL NOTES AND DRAWING LIST

DATE JULY 2012 | DWG. NO. 009-001-G41 | REVISION 3



NOTE:

1. POINT LOCATIONS ARE PLACED ALONG INSIDE EDGE OF DITCHES AND/OR ALONG OUTSIDE EDGE OF ACCESS ROADS.

REFERENCE	NO.	REVISIONS	BY	DATE	NO.	REVISIONS	BY	DATE
					2	ISSUED FOR CONSTRUCTION	RPS	7/12
					1	ISSUE FOR INITIAL DRAINAGE CONTROLS	RPS	5/12
					0	ISSUE FOR AGENCY FINAL REVIEW	RPS	3/12

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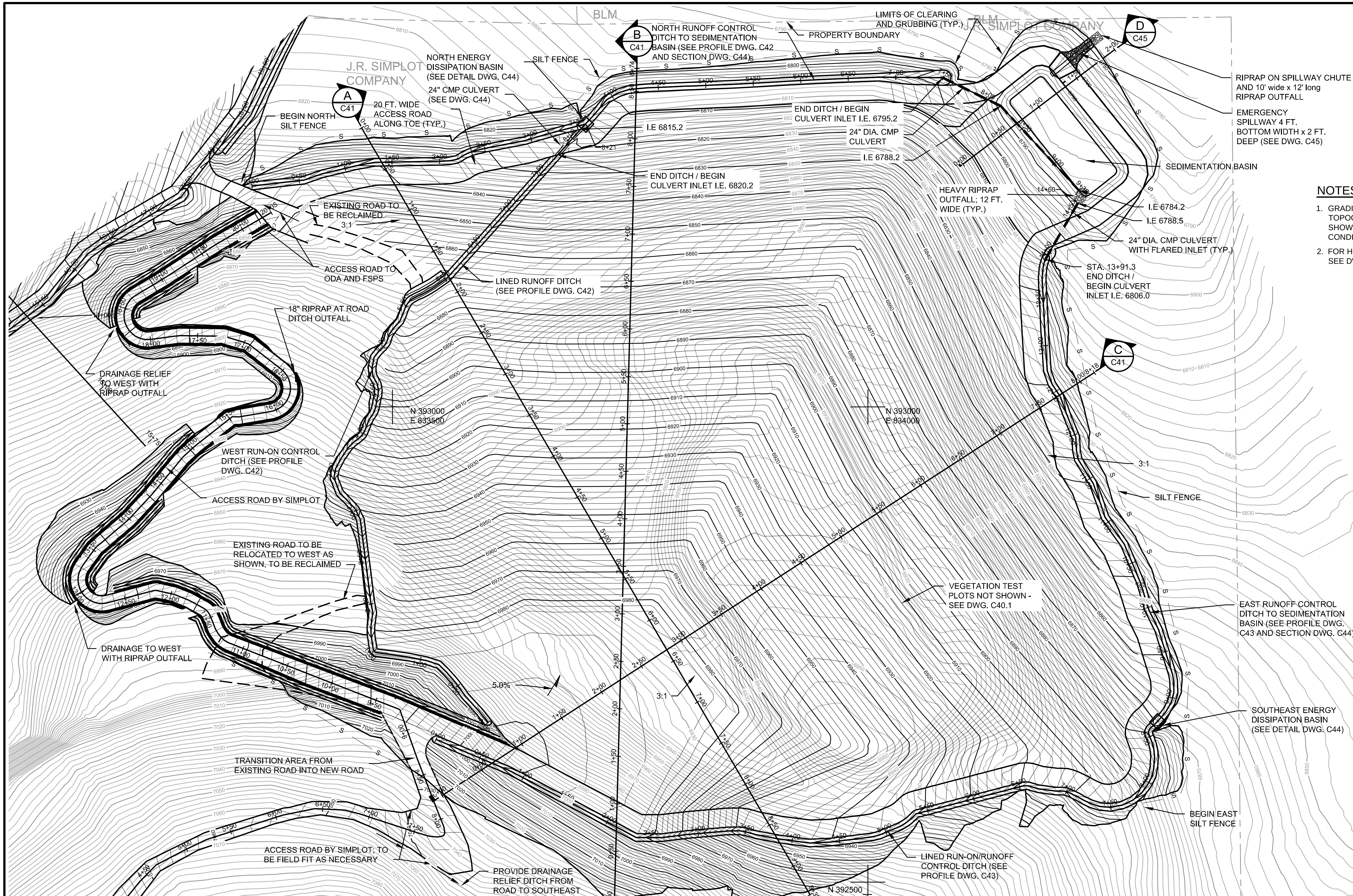
J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

PILOT AREA HORIZONTAL AND VERTICAL CONTROL - PLAN

DATE JULY 2012 | DWG. NO. 009-001-G42 | REVISION 2



N

SCALE

50 0 50 FEET

NOTES:

1. GRADING PLAN IS BASED ON BEST AVAILABLE TOPOGRAPHY, LOCATIONS AND ELEVATIONS SHOWN MAY VARY DEPENDING ON FIELD CONDITIONS ENCOUNTERED.
2. FOR HORIZONTAL AND VERTICAL CONTROL, SEE DWG. G42.

REFERENCE	NO.	REVISIONS	BY	DATE	NO.	REVISIONS	BY	DATE
					3	ISSUED FOR CONSTRUCTION	RPS	7/12
					2	ISSUED FOR INITIAL DRAINAGE CONTROLS	RPS	5/12
					1	ISSUE FOR FINAL AGENCY REVIEW	RPS	3/12
					0	ISSUE FOR REVIEW	RPS	10/11

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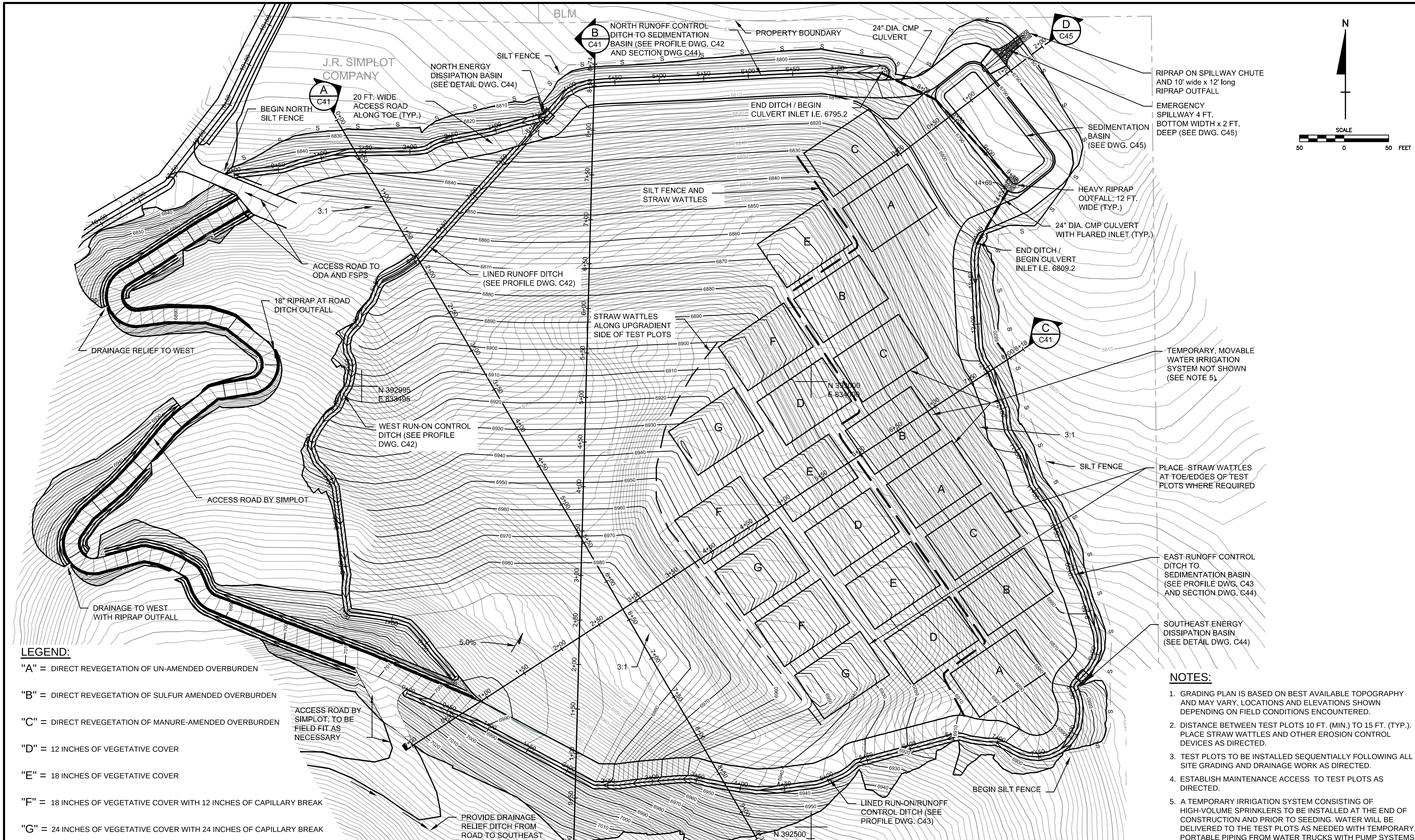
J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

PILOT AREA REGRADING PLAN

DATE JULY 2012 | DWG. NO. 009-001-C40 | REVISION 3



LEGEND:

"A" = DIRECT REVEGETATION OF UN-AMENDED OVERBURDEN

"B" = DIRECT REVEGETATION OF SULFUR AMENDED OVERBURDEN

"C" = DIRECT REVEGETATION OF MANURE-AMENDED OVERBURDEN

"D" = 12 INCHES OF VEGETATIVE COVER

"E" = 18 INCHES OF VEGETATIVE COVER

"F" = 18 INCHES OF VEGETATIVE COVER WITH 12 INCHES OF CAPILLARY BREAK

"G" = 24 INCHES OF VEGETATIVE COVER WITH 24 INCHES OF CAPILLARY BREAK

NOTES:

1. GRADING PLAN IS BASED ON BEST AVAILABLE TOPOGRAPHY AND MAY VARY, LOCATIONS AND ELEVATIONS SHOWN DEPENDING ON FIELD CONDITIONS ENCOUNTERED.
2. DISTANCE BETWEEN TEST PLOTS 10 FT. (MIN.) TO 15 FT. (TYP.). PLACE STRAW WATTLES AND OTHER EROSION CONTROL DEVICES AS DIRECTED.
3. TEST PLOTS TO BE INSTALLED SEQUENTIALLY FOLLOWING ALL SITE GRADING AND DRAINAGE WORK AS DIRECTED.
4. ESTABLISH MAINTENANCE ACCESS TO TEST PLOTS AS DIRECTED.
5. A TEMPORARY IRRIGATION SYSTEM CONSISTING OF HIGH-VOLUME SPRINKLERS TO BE INSTALLED AT THE END OF CONSTRUCTION AND PRIOR TO SEEDING. WATER WILL BE DELIVERED TO THE TEST PLOTS AS NEEDED WITH TEMPORARY, PORTABLE PIPING FROM WATER TRUCKS WITH PUMP SYSTEMS.

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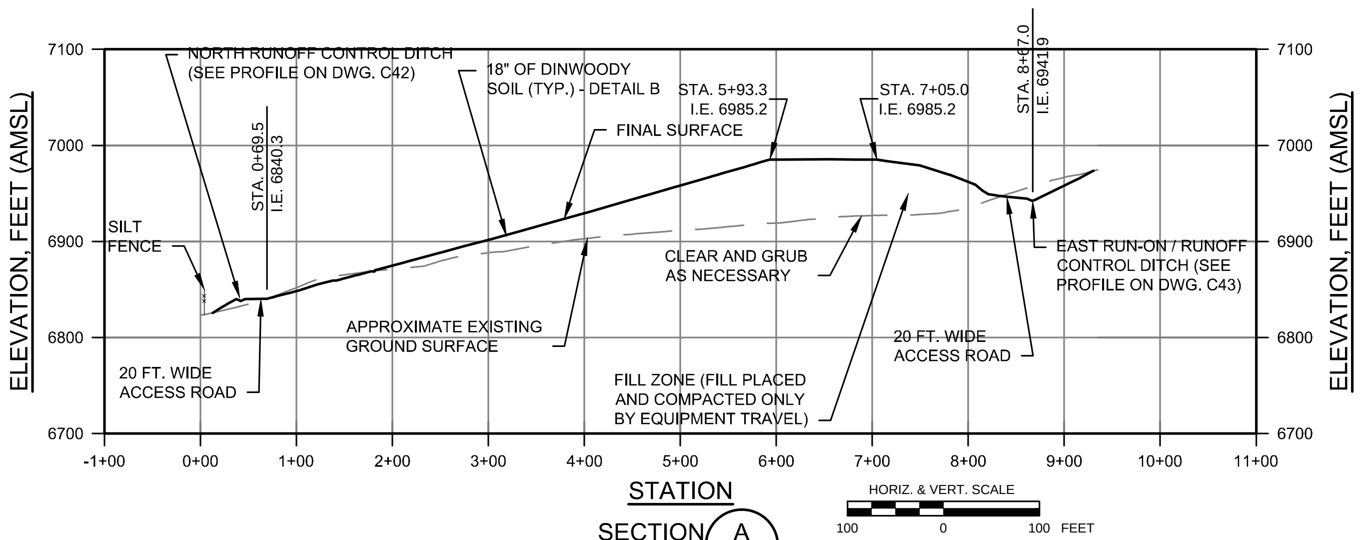
CHECKED BY: JHR
APPROVED BY: RPS
FILE NAME: 009-001-C40-POINT1 .DWG

J.R. SIMPLOT COMPANY - CONDA MINE

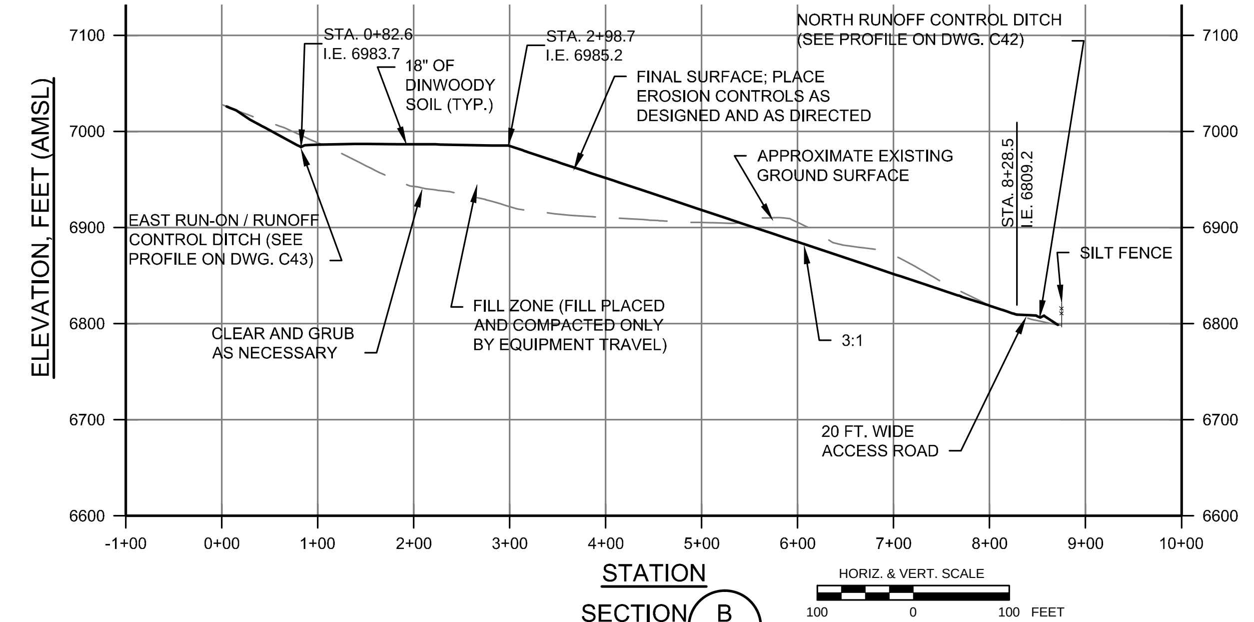
FIELD SCALE PLANT UPTAKE PILOT STUDY

PLAN OF TEST PLOTS ON EAST SIDE SLOPE

DATE JULY 2012 | DWG. NO. 009-001-C40.1 | REVISION 2



SECTION A
C40



SECTION B
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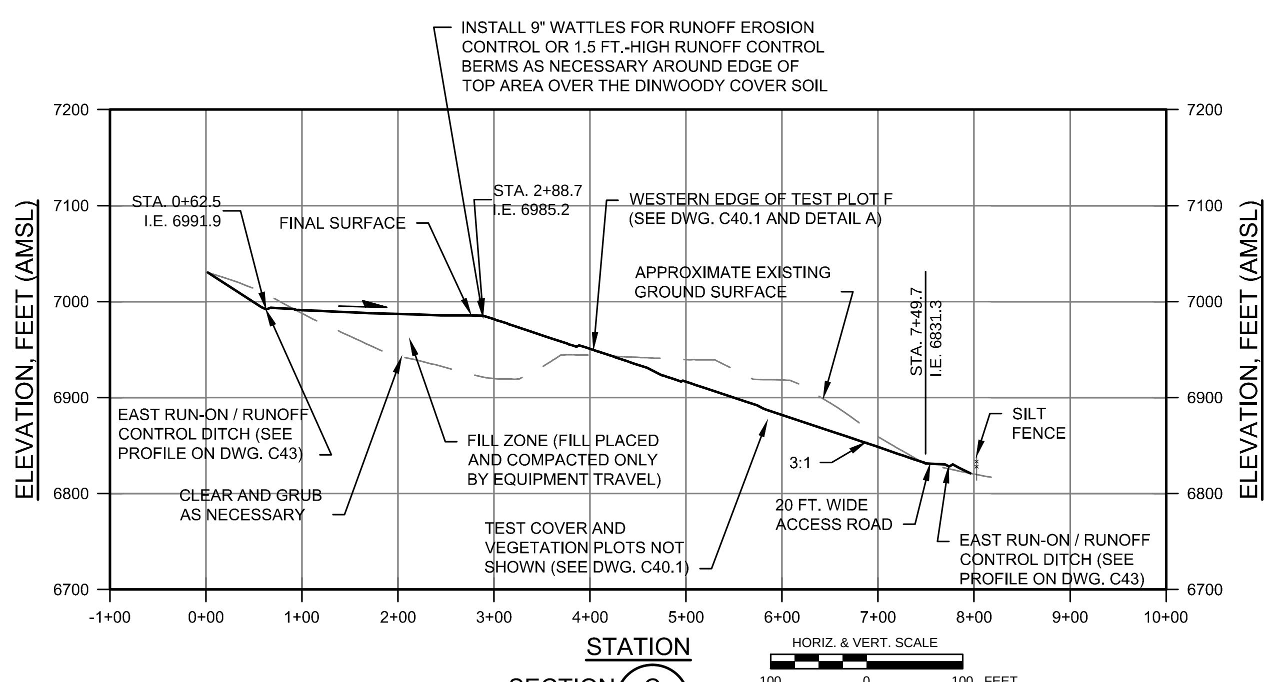
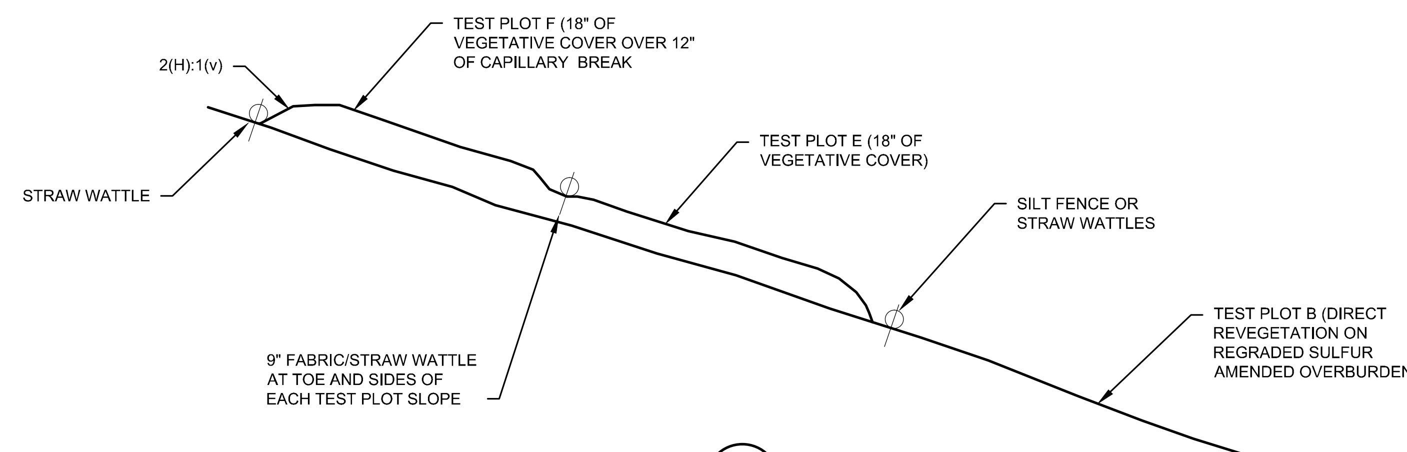
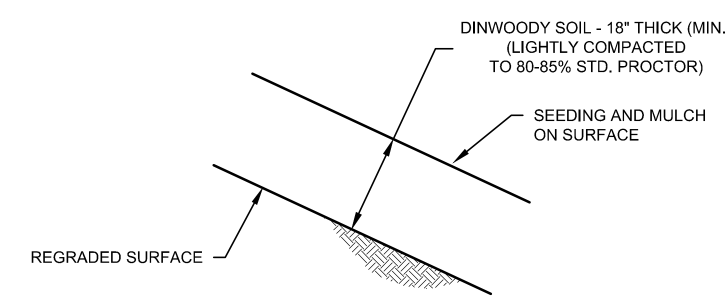


SECTION C
C40



DETAIL A
NOT TO SCALE
-



DETAIL B
NOT TO SCALE
-

NOTES:

1. STATIONS AND ELEVATIONS ARE APPROXIMATE AND MAY VARY IN THE FIELD FROM THOSE SHOWN. MAINTAIN DESIGN SIDE SLOPES WITHIN ALLOWABLE TOLERANCES.
2. FILL COMPACTED ONLY BY EQUIPMENT TRAVEL; 2 PASSES OF SCRAPER ON 10-12" LIFTS.
3. ALL REGRADED AREAS OUTSIDE THE TEST PLOT AREA TO BE COVERED WITH 18" OF DINWOODY SOIL.

REFERENCE	NO.	REVISIONS	BY	DATE	NO.	REVISIONS	BY	DATE
					2	ISSUED FOR CONSTRUCTION	RPS	7/12
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APPROVED BY: RPS
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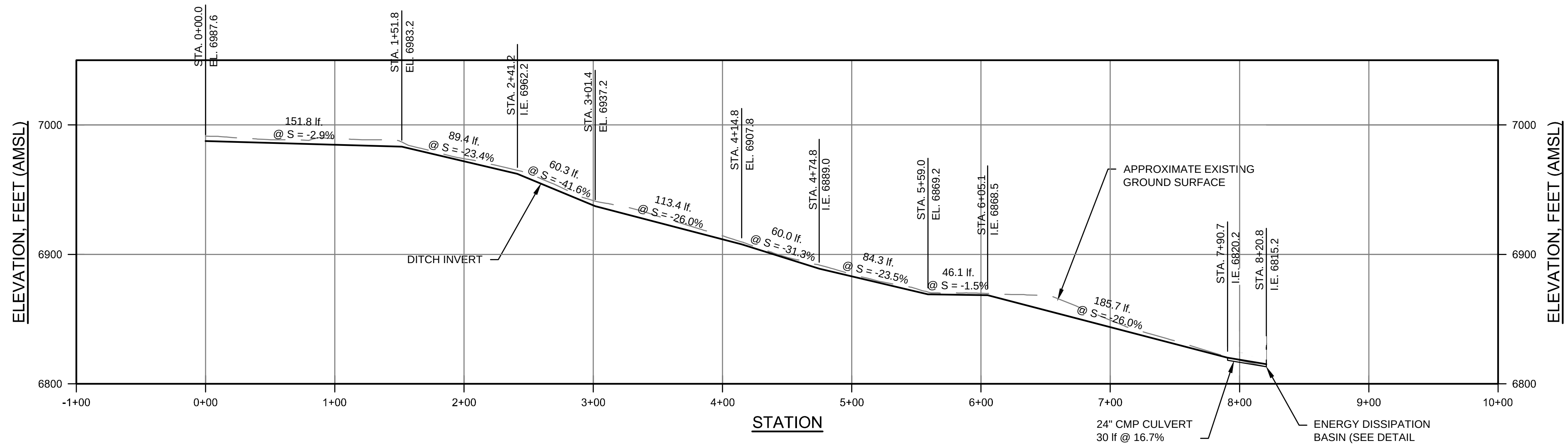
J.R. SIMPLOT COMPANY - CONDA MINE
FIELD SCALE PLANT UPTAKE PILOT STUDY

TYPICAL SECTIONS AND DETAIL

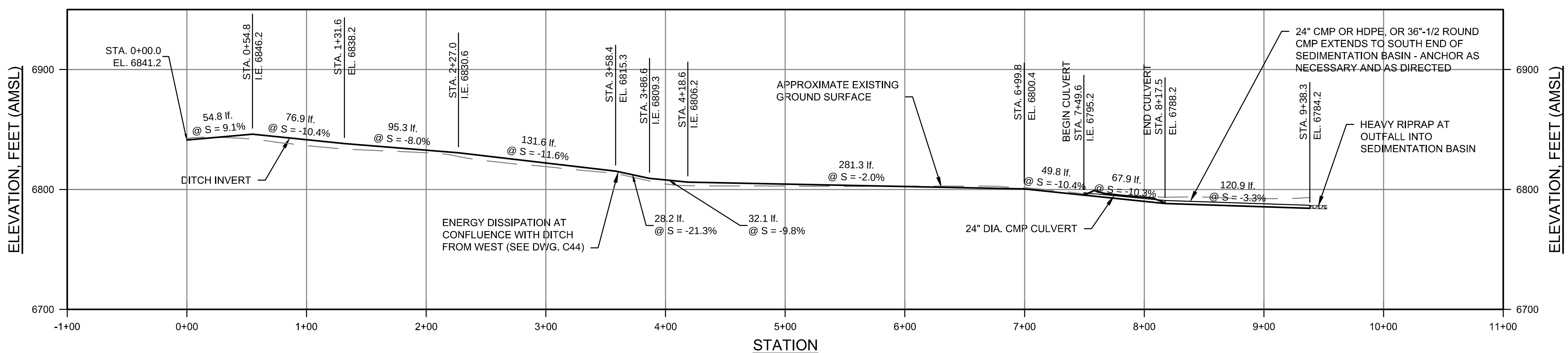
DATE JULY 2012 | DWG. NO. 009-001-C41 | REVISION 2



WEST RUN-ON CONTROL DITCH PROFILE

HORIZ. & VERT. SCALE

50 0 50 FEET



NORTH RUNOFF CONTROL DITCH PROFILE

HORIZ. & VERT. SCALE

50 0 50 FEET

NOTES:

1. STATIONS AND ELEVATIONS ARE APPROXIMATE AND MAY VARY IN THE FIELD FROM THOSE SHOWN.
2. INSTALL TRM IN ALL DITCH REACHES IN EXCESS OF 10%. USE SEED AND MULCH IN ALL REACHES LESS THAN 10%.

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					3	ISSUED FOR CONSTRUCTION	RPS	7/12
					2	ISSUED FOR INITIAL DRAINAGE CONTROLS	RPS	5/12
					1	ISSUE FOR FINAL AGENCY REVIEW	RPS	3/12
					0	ISSUE FOR REVIEW	RPS	10/11

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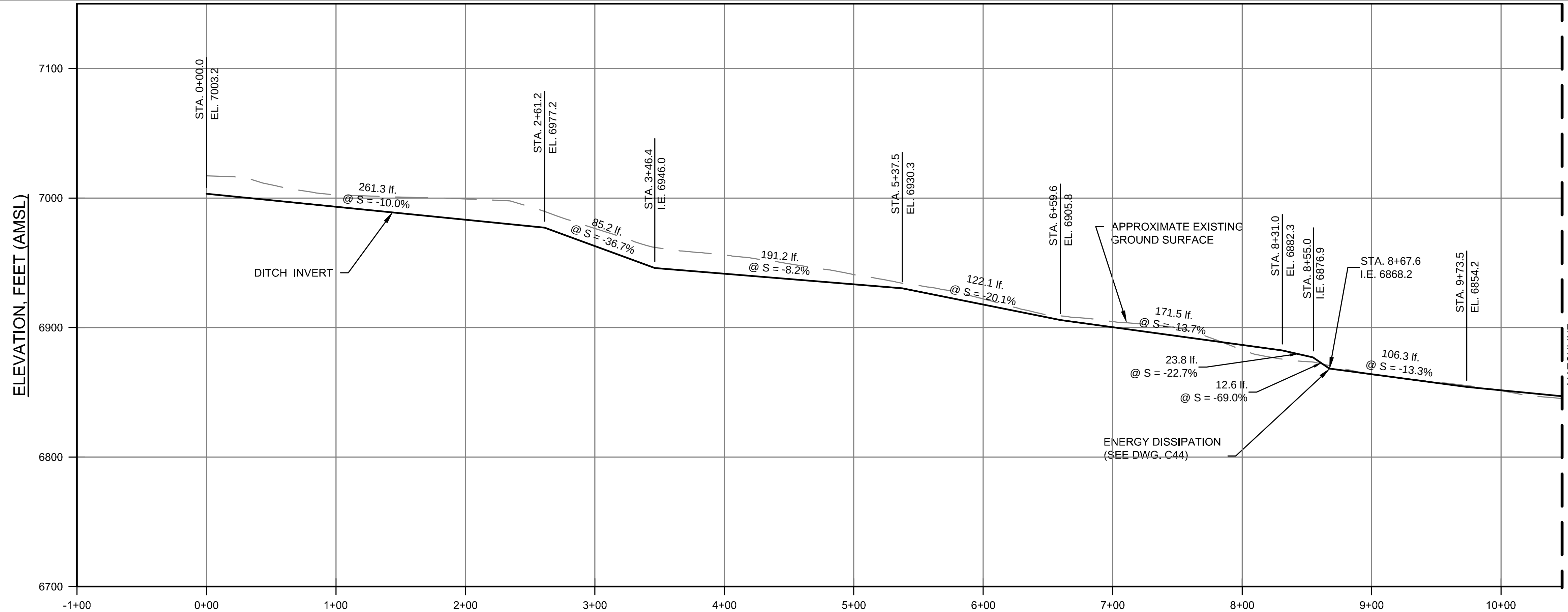
J.R. SIMPLOT COMPANY - CONDA MINE

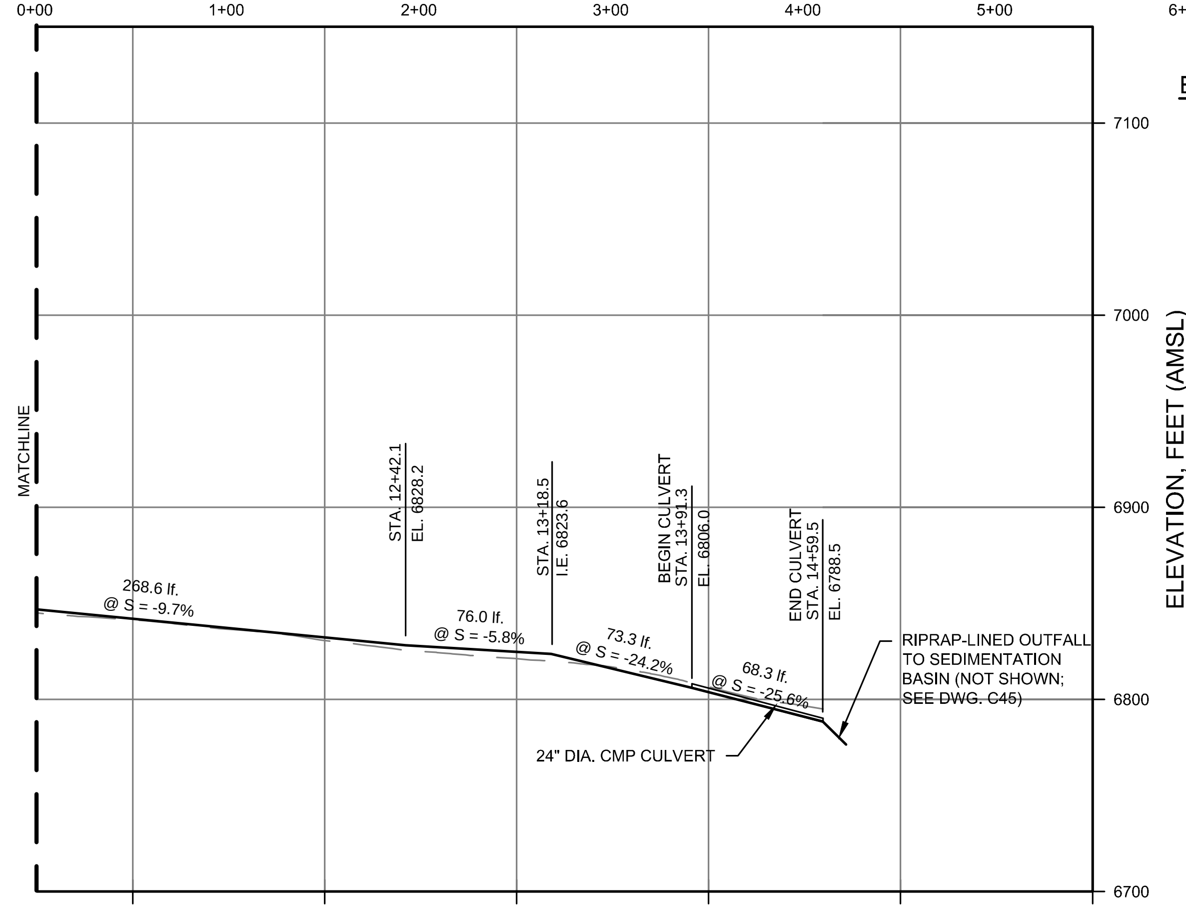
FIELD SCALE PLANT UPTAKE PILOT STUDY

WEST AND NORTH RUN-ON AND RUNOFF DITCH PROFILES

DATE JULY 2012 | DWG. NO. 009-001-C42 | REVISION 3



EAST RUN-ON/RUNOFF CONTROL DITCH PROFILE



HORIZ. & VERT. SCALE

50 0 50 FEET

NOTES:

1. DITCH STATIONS AND ELEVATIONS ARE APPROXIMATE AND MAY VARY IN THE FIELD FROM THOSE SHOWN.
2. INSTALL TRM IN ALL DITCH REACHES IN EXCESS OF 10%. USE SEED AND MULCH IN ALL REACHES LESS THAN 10%.

REFERENCE	NO.	REVISIONS	BY	DATE	NO.	REVISIONS	BY	DATE
					3	ISSUED FOR CONSTRUCTION	RPS	7/12
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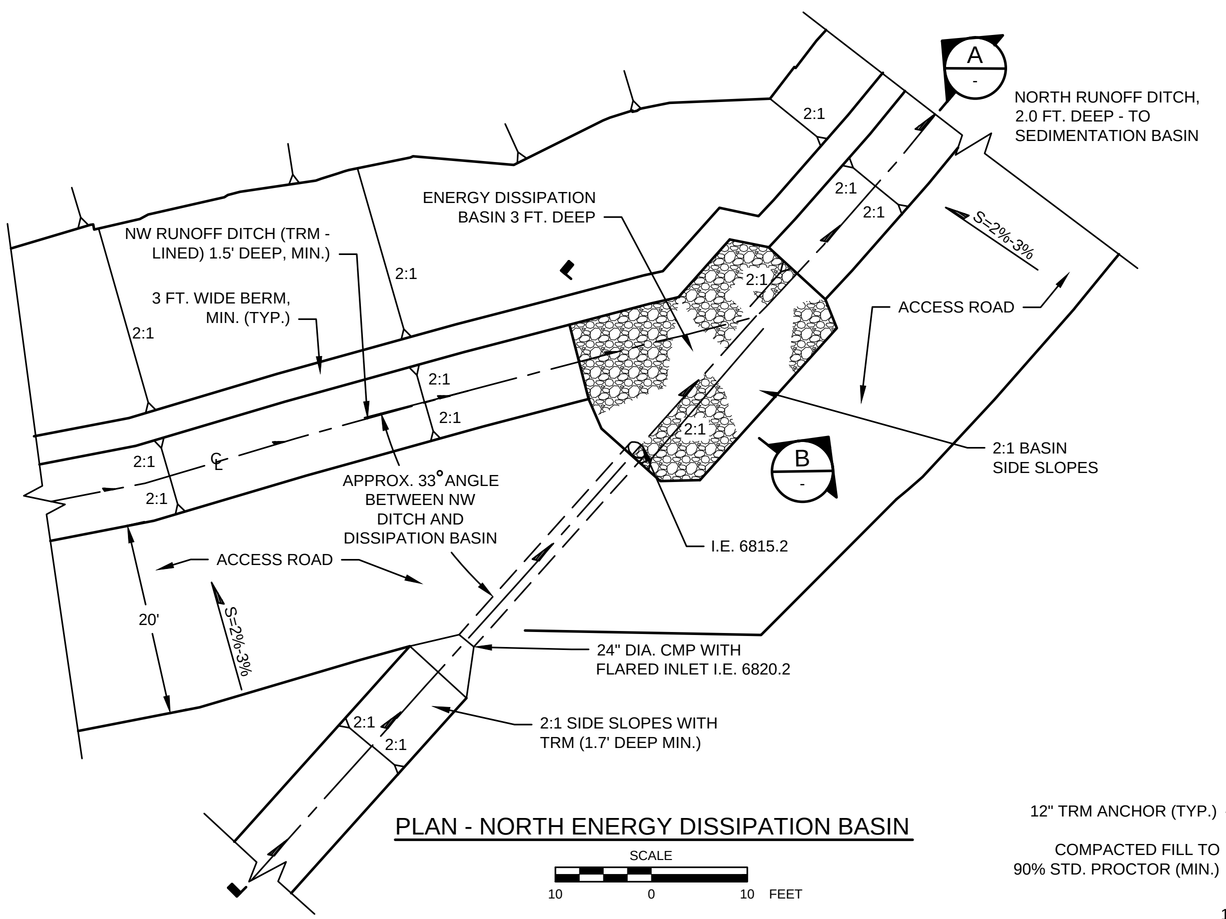
CHECKED BY:	JHR
APPROVED BY:	RPS
FILE NAME:	009-001-C43 .DWG

J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

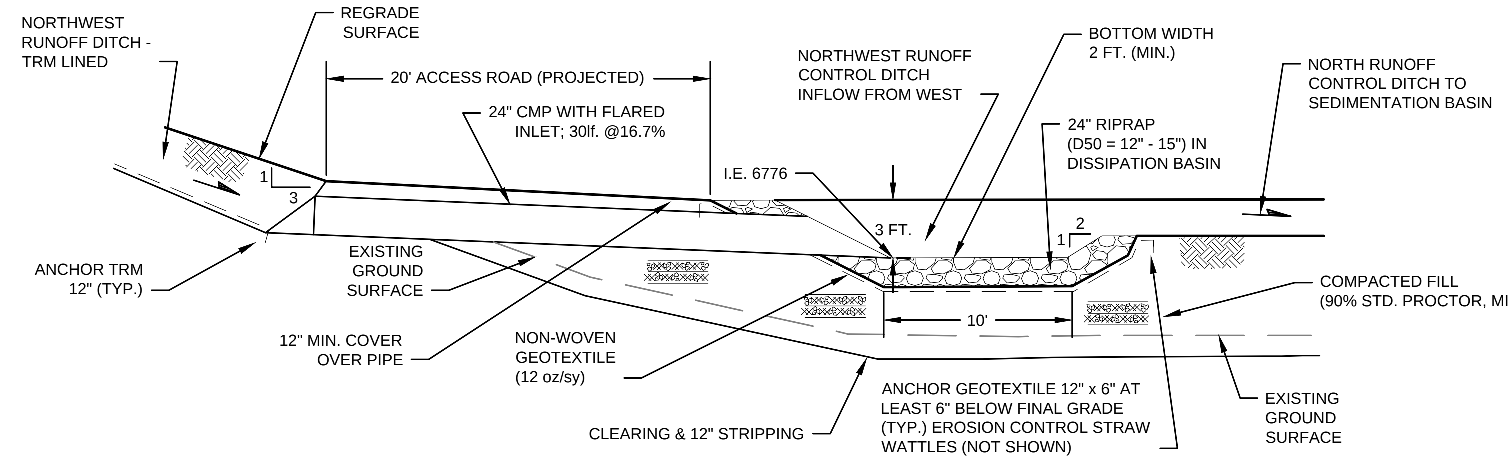
EAST RUN-ON/RUNOFF CONTROL DITCH PROFILE

DATE	DWG. NO.	REVISION
JULY 2012	009-001-C43	3



PLAN - NORTH ENERGY DISSIPATION BASIN

SCALE 10 0 10 FEET



SECTION A

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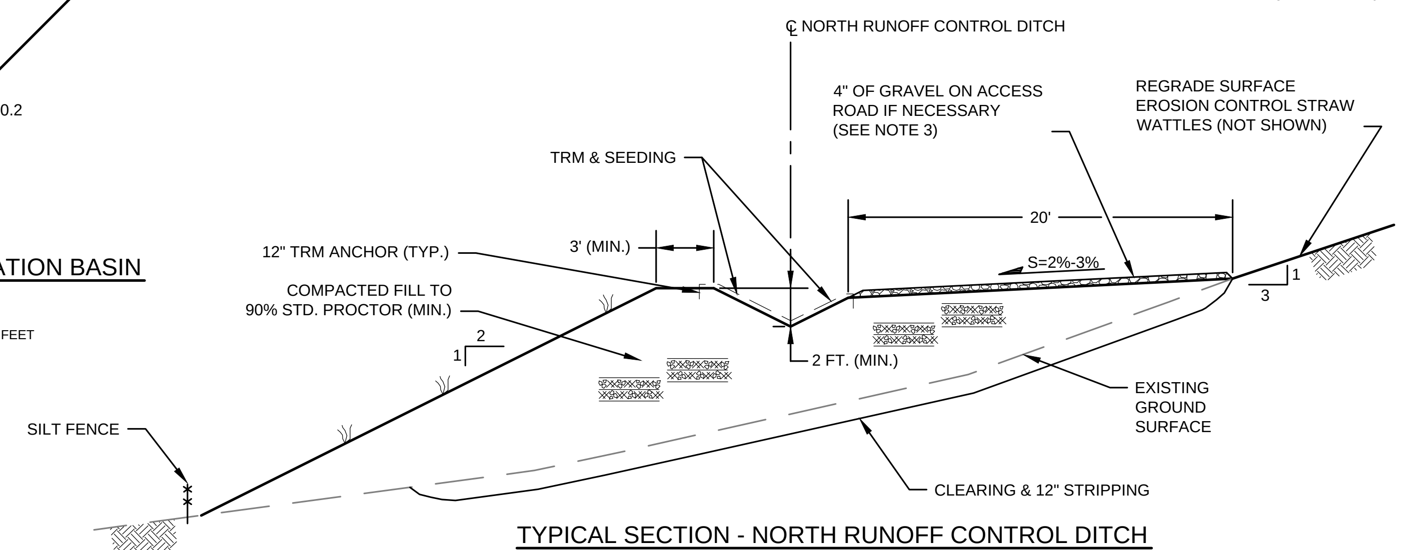
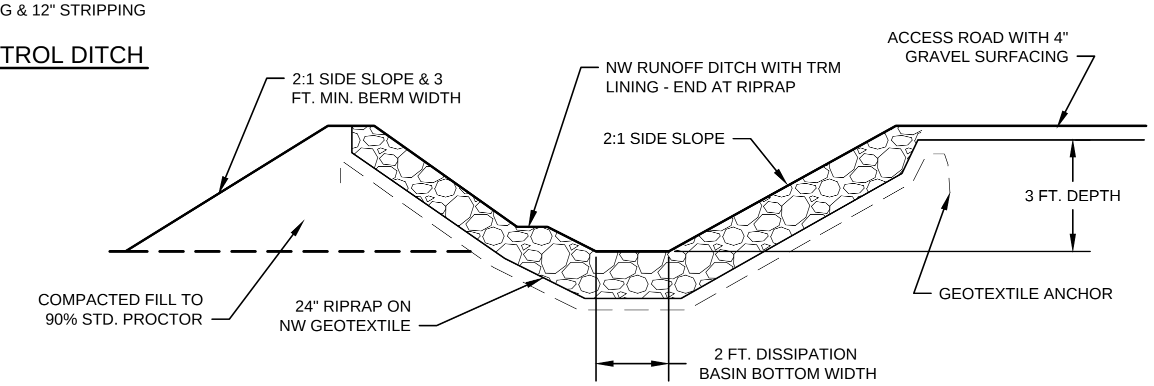


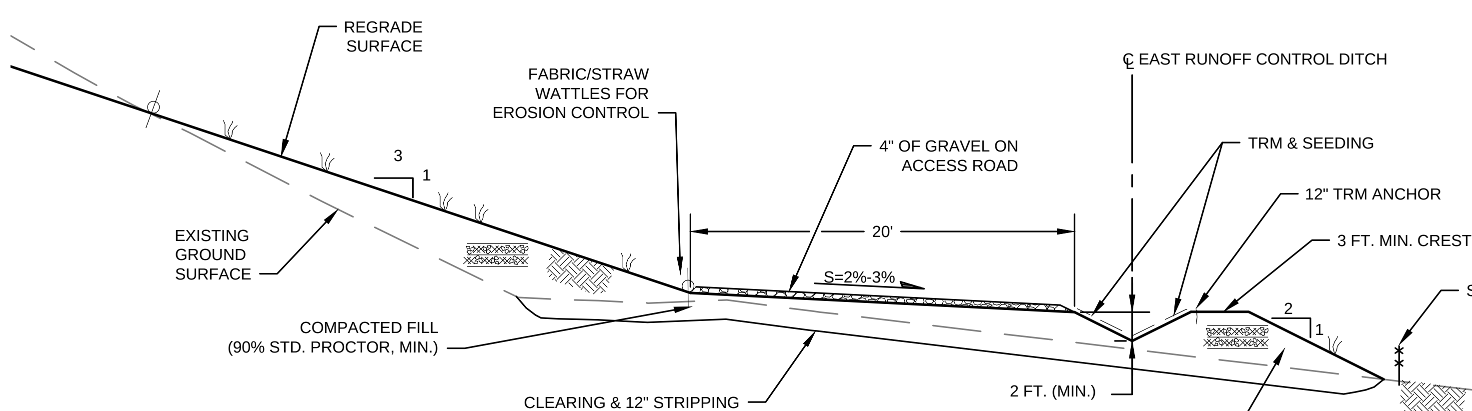
TYPICAL SECTION - NORTH RUNOFF CONTROL DITCH

SCALE 5 0 5 FEET



SECTION B

NOT TO SCALE



EAST RUNOFF DITCH SECTION

SCALE 5 0 5

NOTES:

1. INSTALL TRM IN ALL DITCH REACHES IN EXCESS OF 10%. USE SEED AND MULCH IN ALL REACHES LESS THAN 10% AS DIRECTED.
2. LOCATIONS OF FACILITIES ARE APPROXIMATE AND WILL VARY IN THE FIELD. MAINTAIN DESIGN DIMENSIONS AS NECESSARY.
3. IF ROAD CUTS ARE IN REX CHERT, 4" GRAVEL SURFACING SHOULD NOT BE REQUIRED, AS FIELD DIRECTED.

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					3	ISSUED FOR CONSTRUCTION	RPS	7/12
					2	ISSUED FOR INITIAL DRAINAGE CONTROLS	RPS	5/12
					1	ISSUE FOR FINAL AGENCY REVIEW	RPS	3/12
					0	ISSUE FOR REVIEW	RPS	10/11

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PROFESSIONAL ENGINEER REGISTERED 6984 STATE OF IDAHO JOHN H. RAHE

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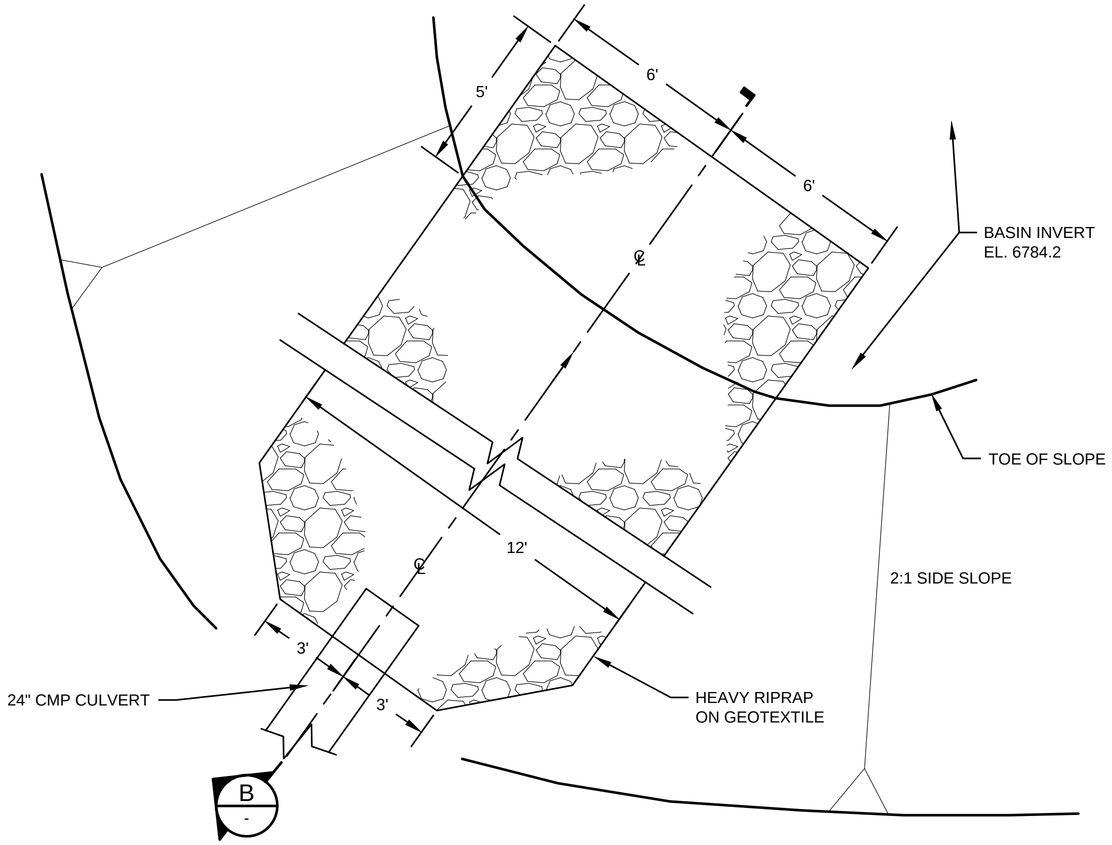
APPROVED BY:	RPS
FILE NAME:	009-001-C44 .DWG

J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

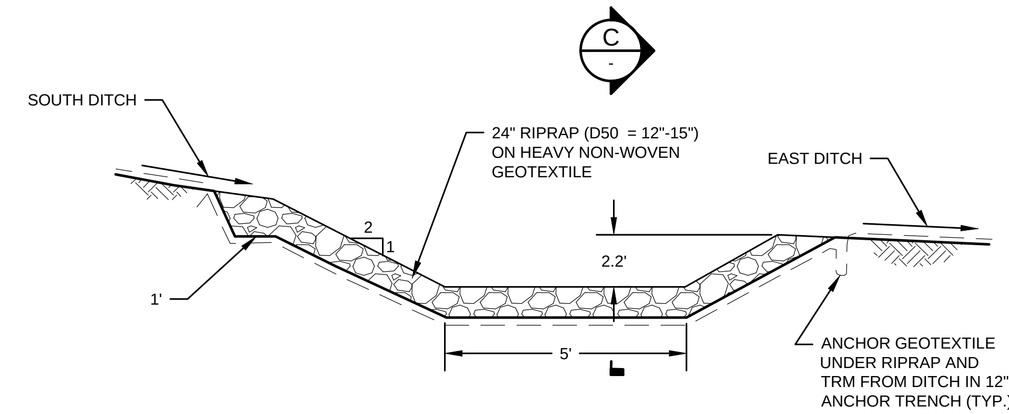
DRAINAGE SYSTEM SECTIONS AND DETAILS

DATE JULY 2012 | DWG. NO. 009-001-C44 | REVISION 3



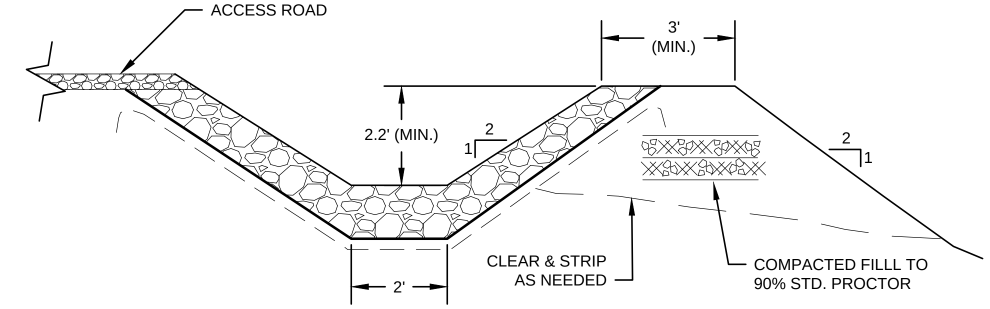
PLAN - OUTFALL TO SEDIMENTATION BASIN

SCALE
3 0 3 FEET



SOUTHEAST DISSIPATION BASIN - PROFILE

NOT TO SCALE



SECTION C -

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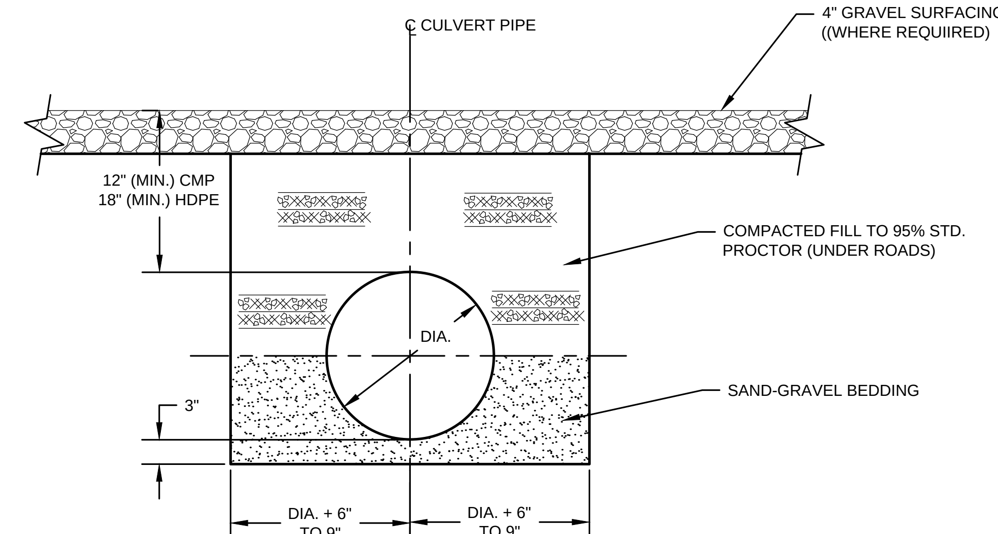

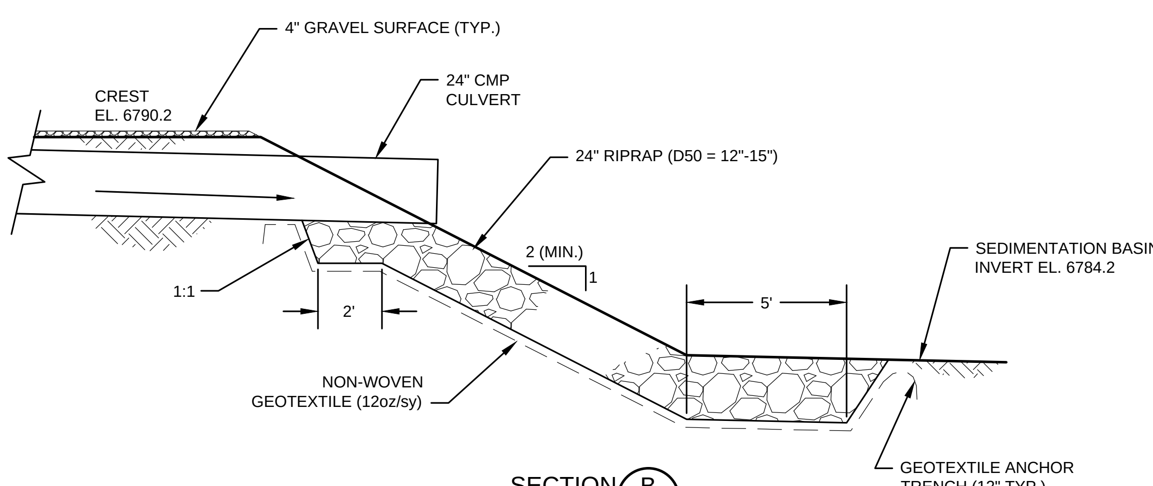

SECTION B -

SCALE
3 0 3 FEET

TYPICAL PIPE CULVERT SECTION

NOT TO SCALE

NOTES:

1. INSTALL TRM IN ALL DITCH REACHES IN EXCESS OF 10%. USE SEED AND MULCH IN ALL REACHES LESS THAN 10% AS DIRECTED.
2. LOCATIONS OF FACILITIES ARE APPROXIMATE AND WILL VARY IN THE FIELD. MAINTAIN DESIGN DIMENSIONS AS NECESSARY.

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					2	ISSUED FOR CONSTRUCTION	RPS	7/12
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[signature] 7 July 2012

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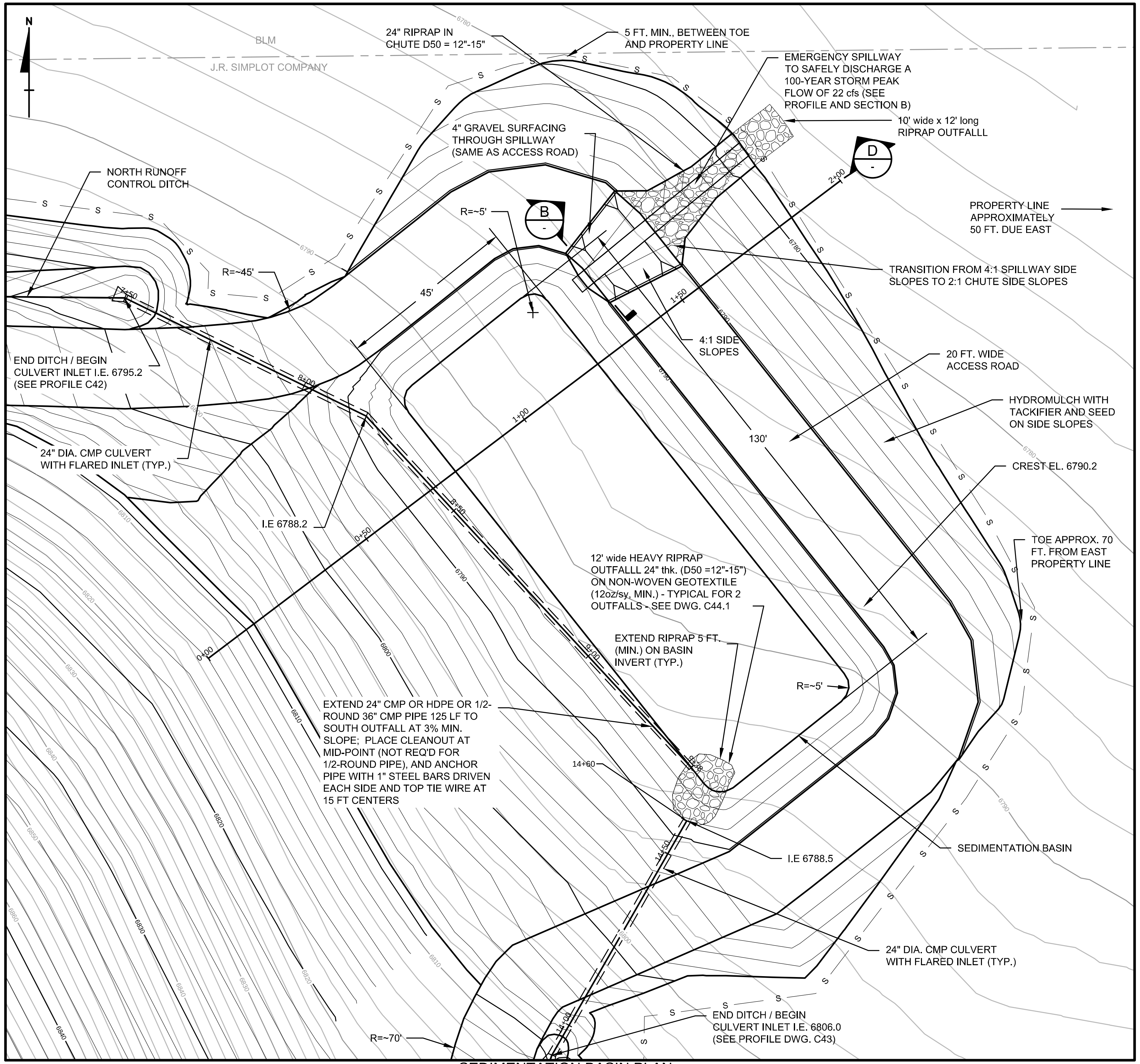
J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

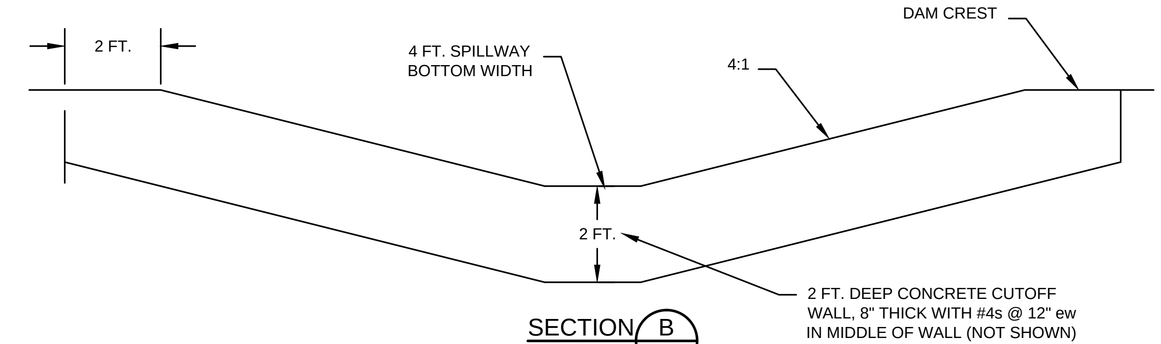
DRAINAGE SYSTEM
SECTIONS AND DETAILS

DATE JULY 2012 | DWG. NO. 009-001-C44.1 | REVISION 2



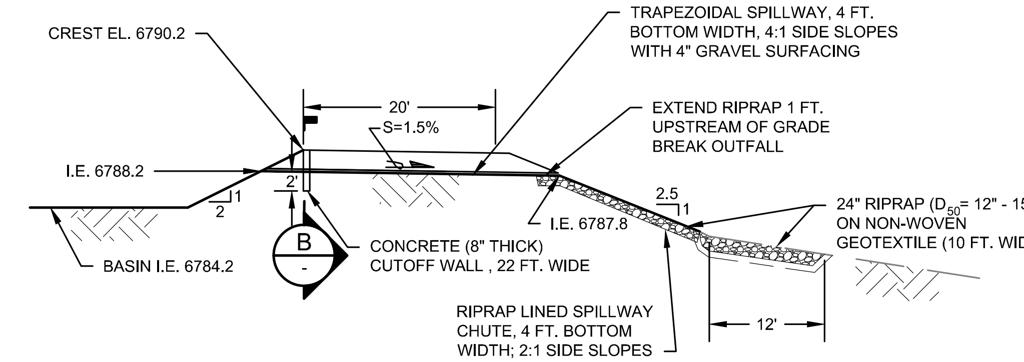
SEDIMENTATION BASIN PLAN

SCALE 15 0 15 FEET



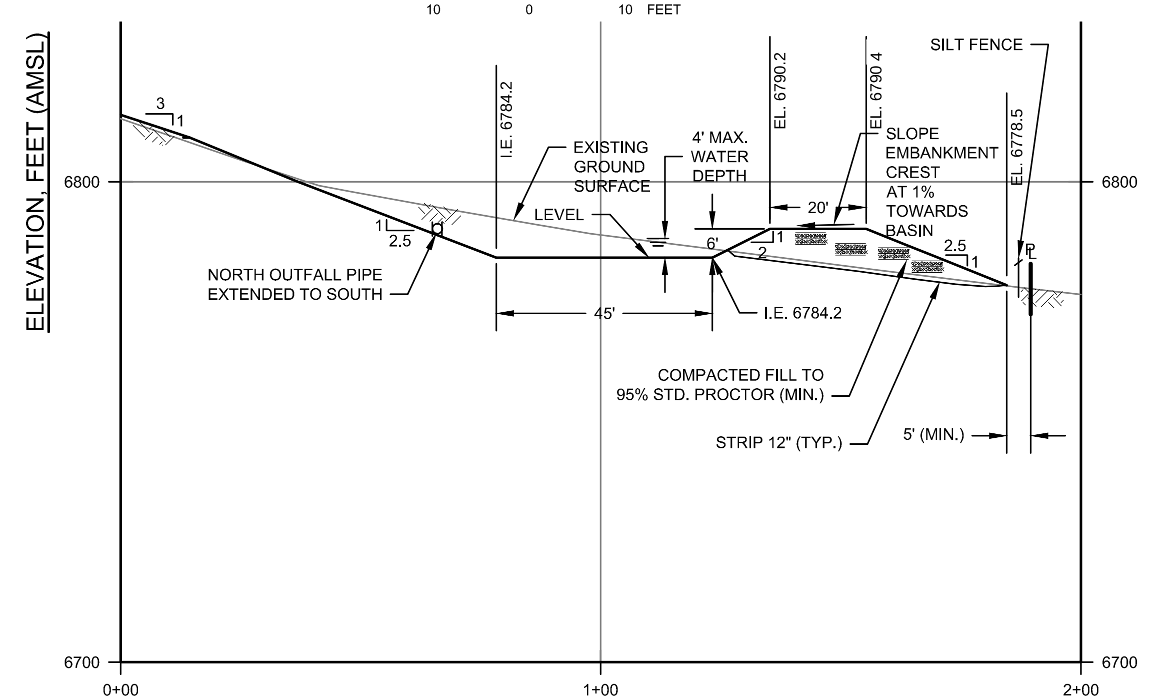
SECTION B

SCALE 2 0 2 FEET



EMERGENCY SPILLWAY PROFILE

SCALE 10 0 10 FEET



TYPICAL SECTION D

SCALE 20 0 20 FEET

NOTES:

1. HEAVY RIPRAP TO CONSIST OF ANGULAR CHERT, 24" WITH D50 SIZE OF 12" - 15" ON NON-WOVEN GEOTEXTILE.
2. CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.

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					0	ISSUE FOR REVIEW	RPS	10/11

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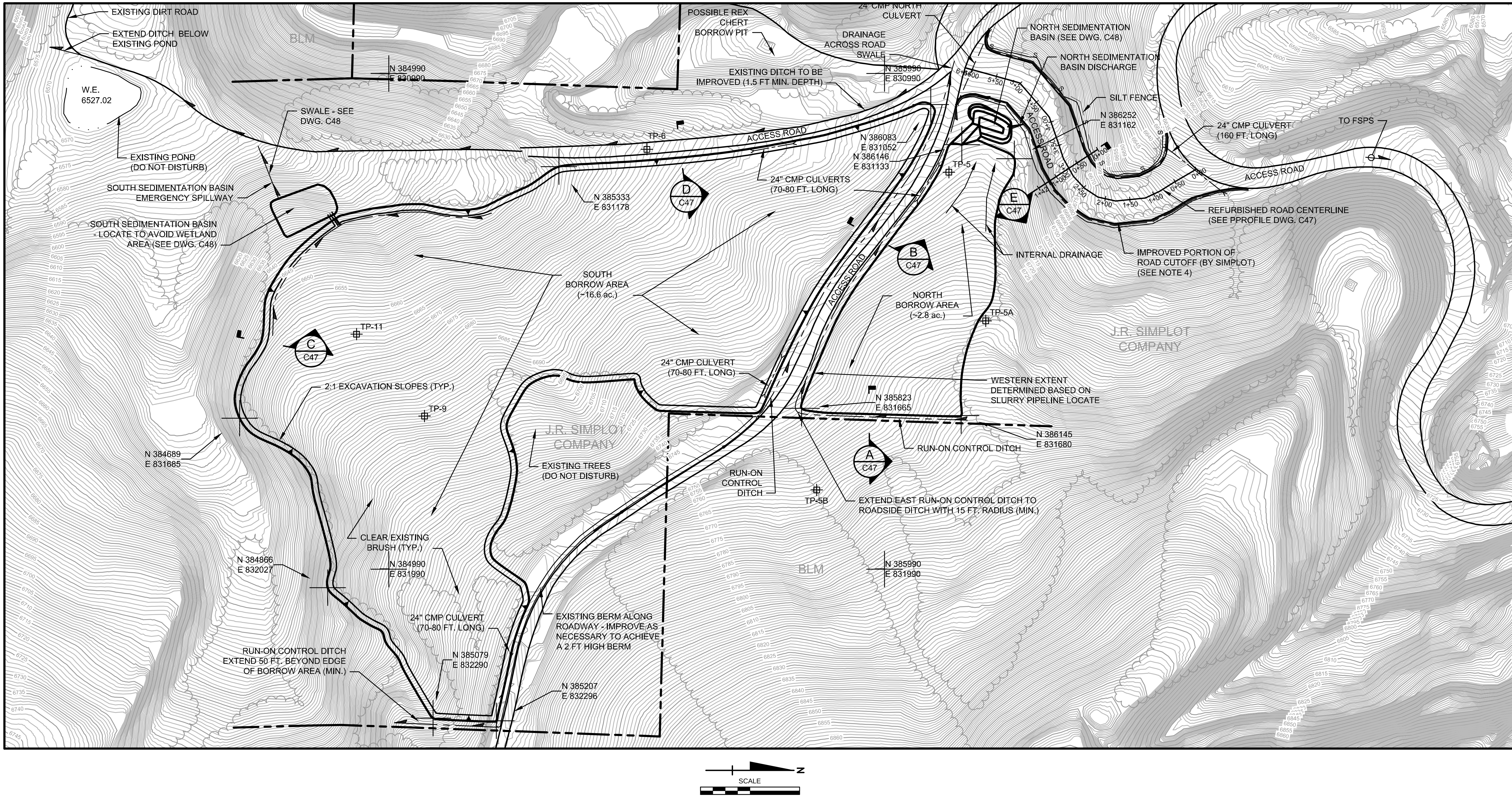
J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

SEDIMENTATION BASIN PLAN, SECTIONS AND DETAILS

DATE JULY 2012 | DWG. NO. 009-001-C45 | REVISION 3



NOTES:

1. LIMITS OF BORROW AREAS SHOWN MAY VARY IN THE FIELD DEPENDING ON EDGE OF TREES AND OTHER CONDITIONS ENCOUNTERED.
2. CLEAR BORROW AREAS AS NECESSARY AND STORE CLEARED DEBRIS AND UPPER 6 INCHES OF TOPSOIL FOR RECLAMATION.
3. COLLUVIAL SOILS AND DINWOODY TO BE COMBINED FOR TRANSPORT TO THE FSPS SITE IN 2012.
4. REFURBISH AN EXISTING ROAD APPROXIMATELY 615 FEET IN LENGTH WITH GRADE OF 10% TO ACCOMMODATE UP TO 150 TON HAUL TRUCK TRAFFIC. THE RADIUS OF THE CURVES WILL BE APPROXIMATELY 102 FEET. THE TOTAL CUT AND FILL VOLUMES ARE APPROXIMATELY 33,540 C.Y. AND 440 C.Y., RESPECTIVELY. TOTAL SUBGRADE FOR ROAD BASE 4,155 C.Y. EXCESS DINWOODY FORMATION ROAD MATERIAL CUT VOLUMES WILL BE HAULED TO THE FSPS AREA.

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					0	ISSUE FOR REVIEW	RPS	11/11

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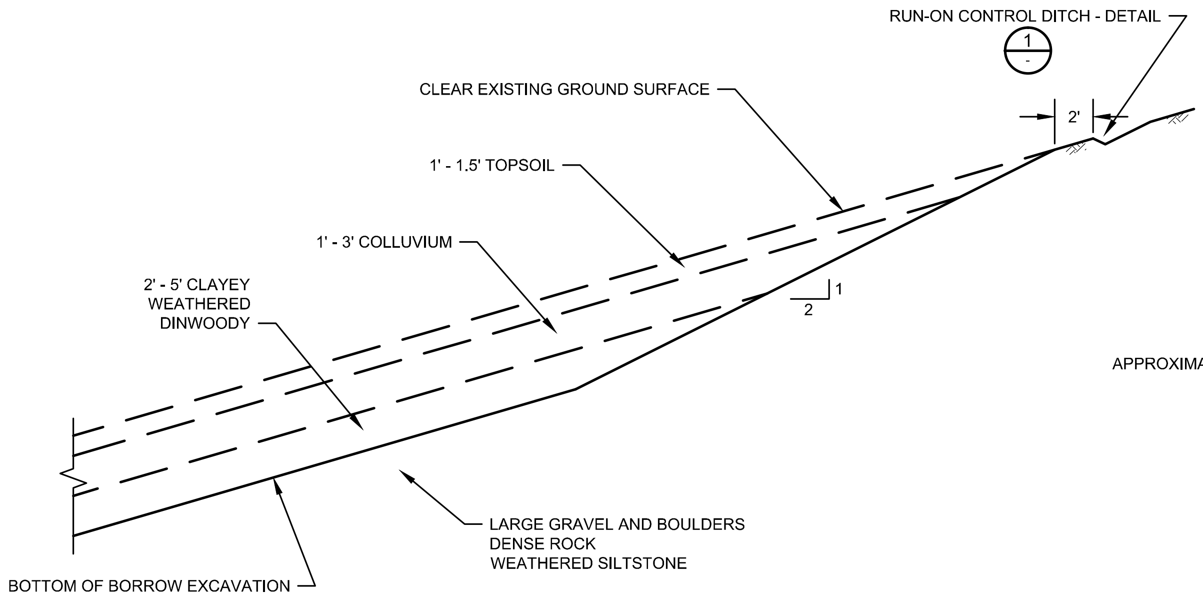
J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

SOIL BORROW AREA PLAN

DATE JULY 2012 | DWG. NO. 009-001-C46 | REVISION 3



TYPICAL SECTION A C46
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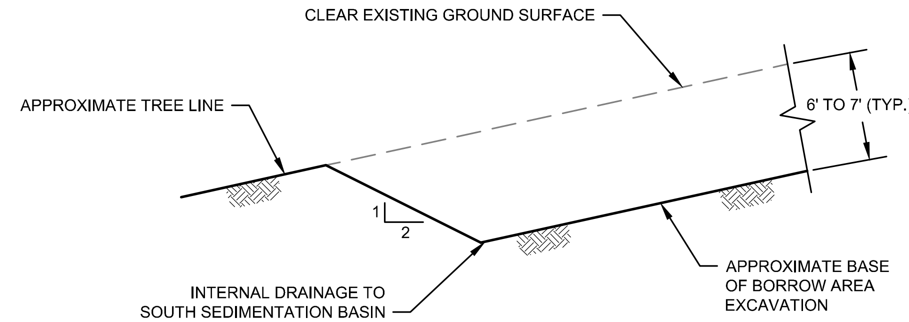

SECTION C C46
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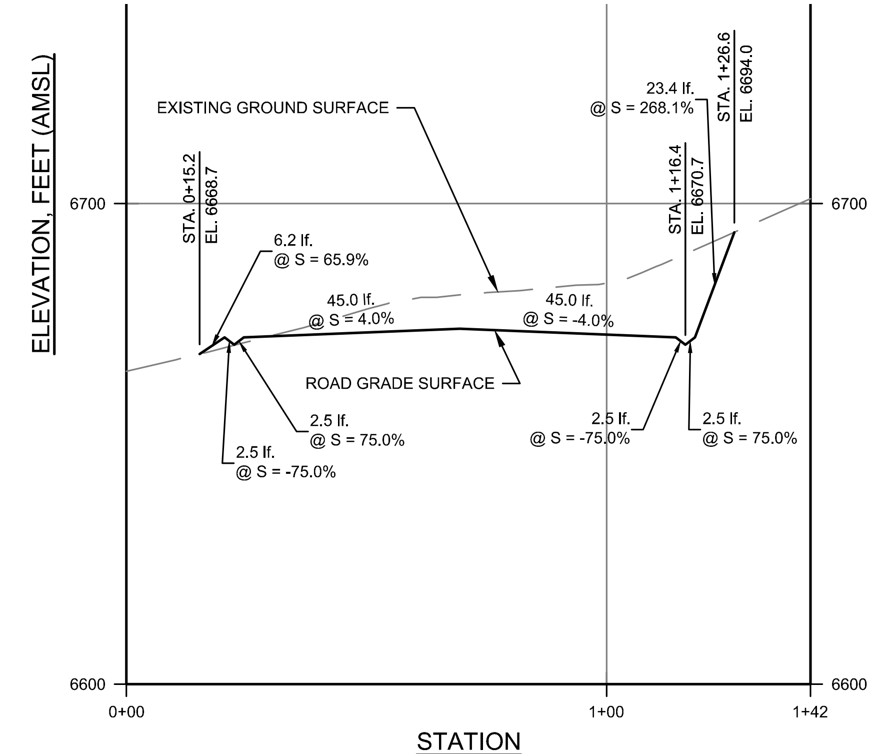

REFURBISHED ROAD TYPICAL SECTION E C46
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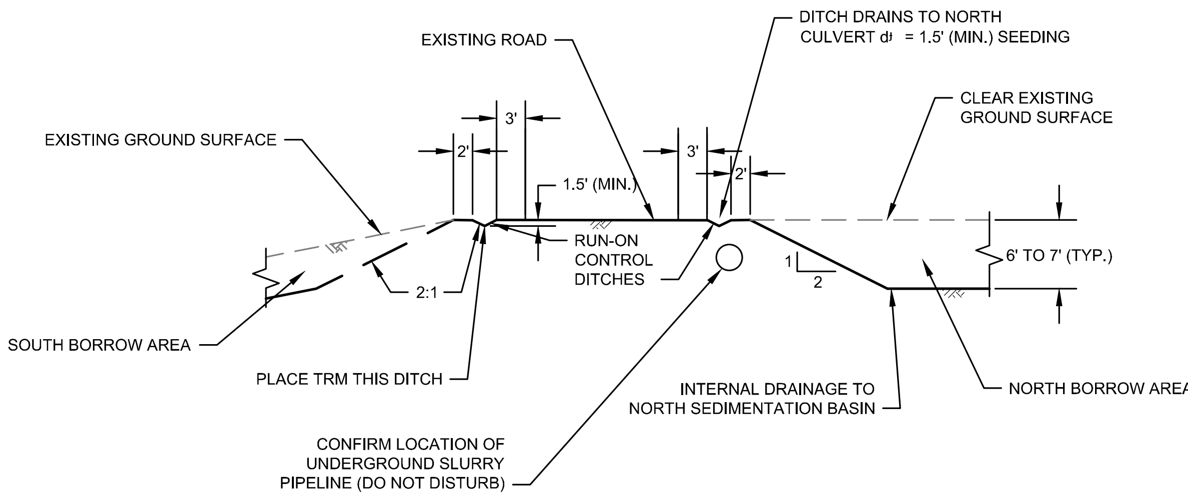

TYPICAL SECTION B C46
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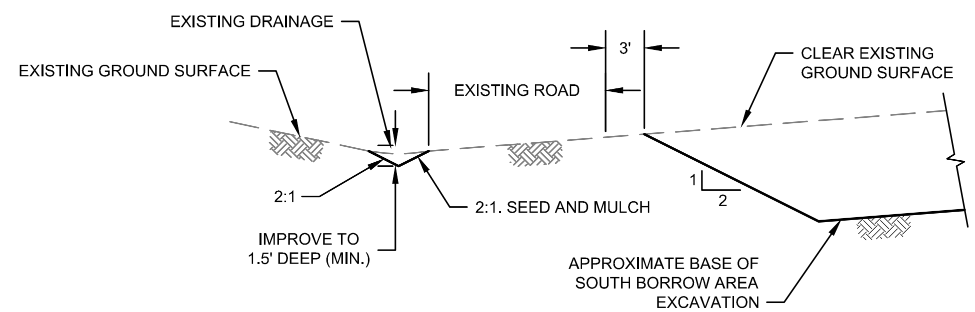

SECTION D C46
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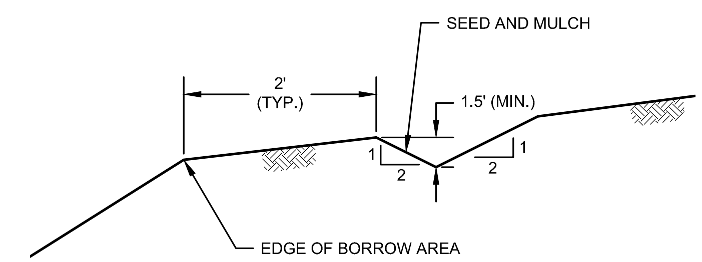
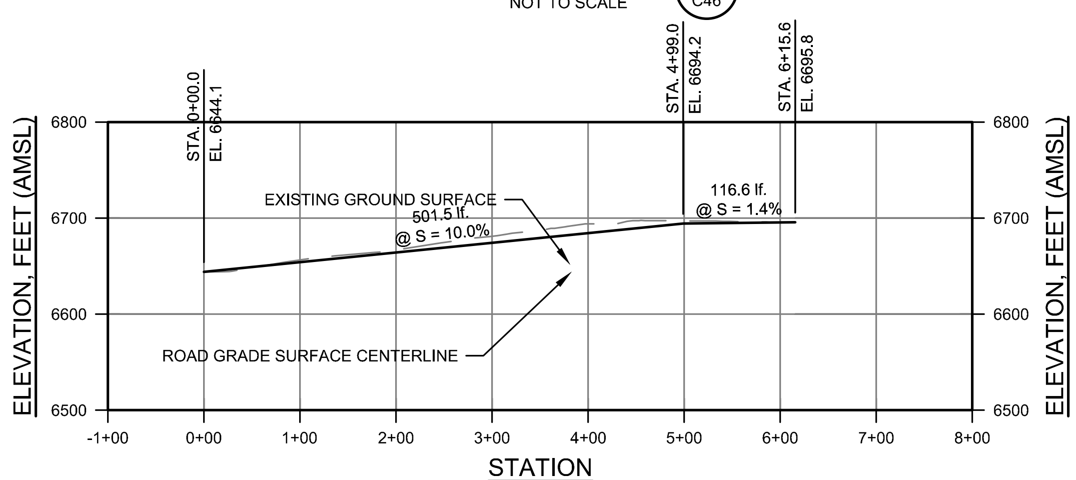
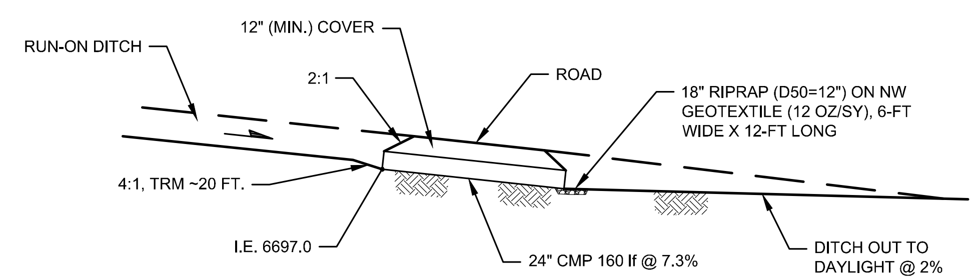


DETAIL 1 -
NOT TO SCALE



REFURBISHED ROAD - PROFILE



NORTH CULVERT PROFILE
NOT TO SCALE

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J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

SOIL BORROW AREA TYPICAL SECTIONS AND RUN-ON/RUNOFF CONTROL DITCHES

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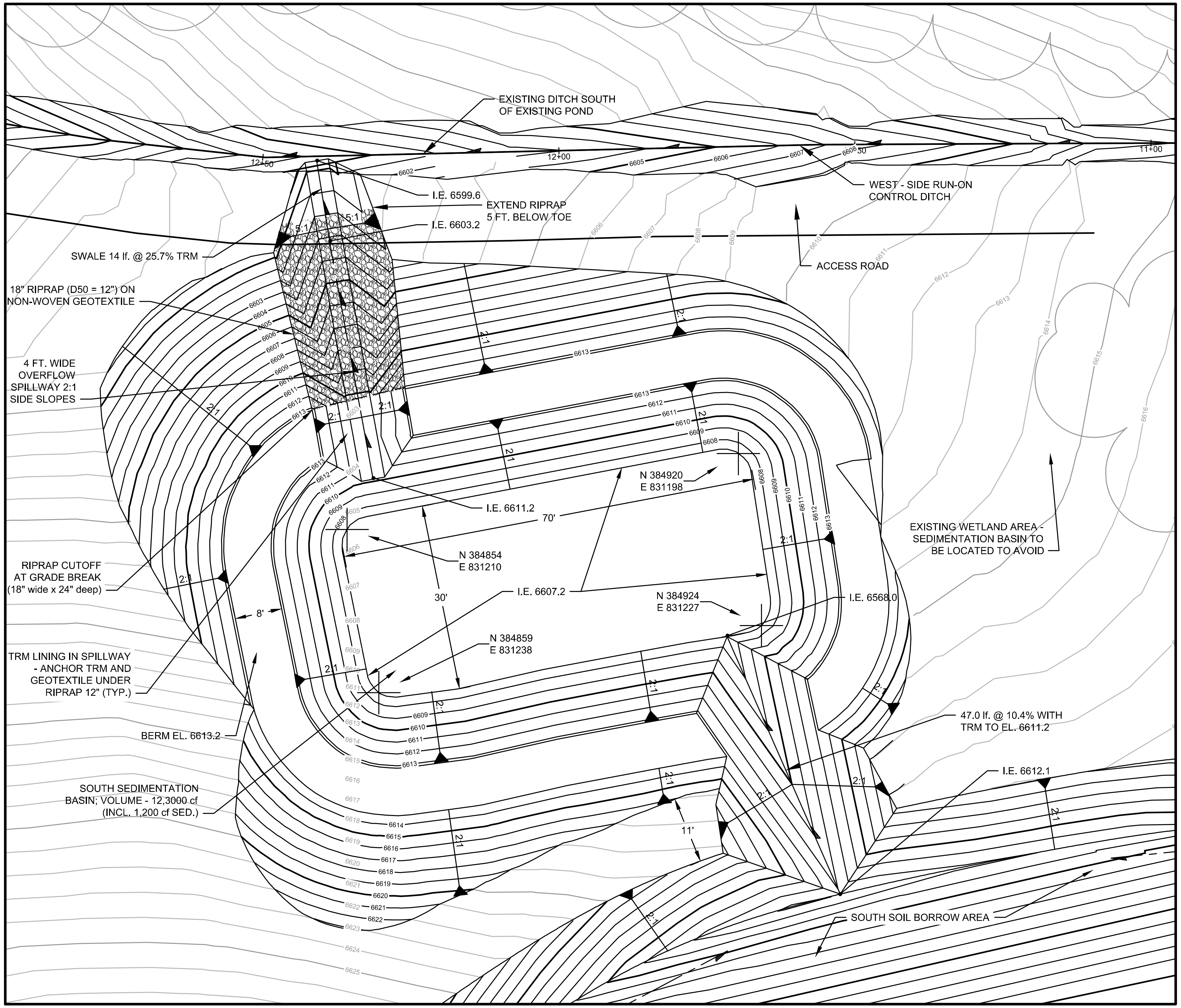
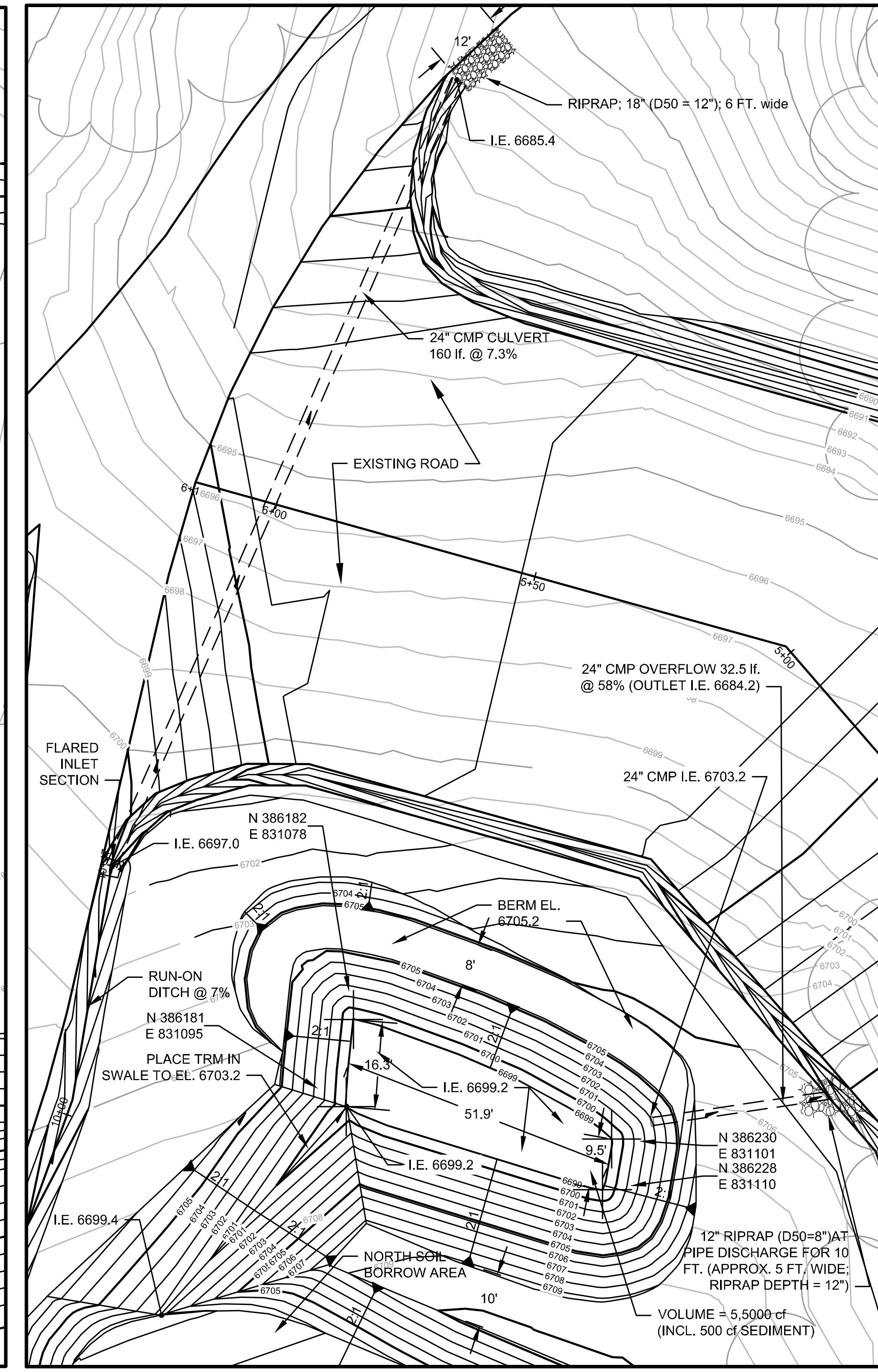


SOUTH BORROW SEDIMENTATION BASIN PLAN

SCALE
10 0 10 FEET



NORTH BORROW SEDIMENTATION BASIN PLAN

SCALE
15 0 15 FEET

NOTE:
1. FIELD ADJUSTMENT OF SEDIMENTATION BASIN LOCATION MAY BE REQUIRED DEPENDING ON EXTENT OF WETLAND AREA.

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					3	ISSUED FOR CONSTRUCTION	RPS	7/12
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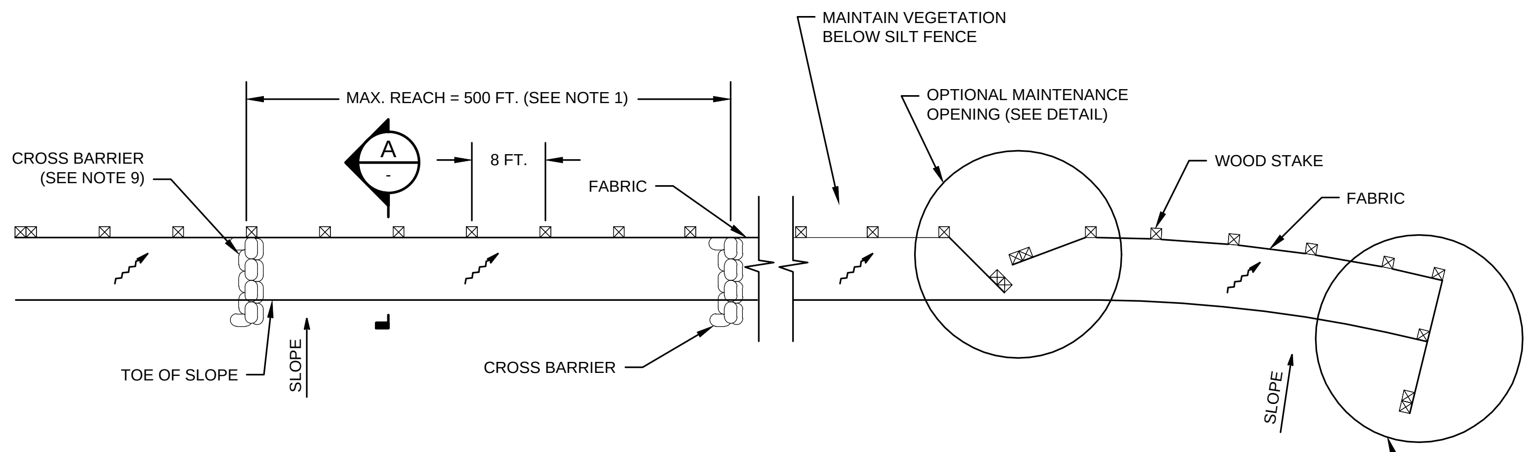
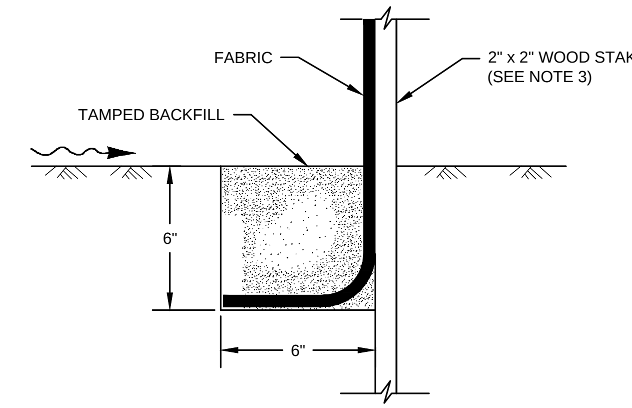
J.R. SIMPLOT COMPANY - CONDA MINE
FIELD SCALE PLANT UPTAKE PILOT STUDY

SOIL BORROW AREAS
SEDIMENTATION BASIN PLANS

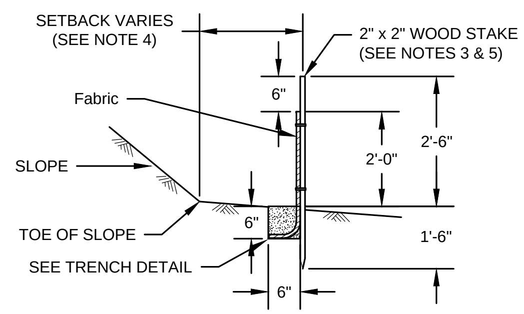
DATE JULY 2012 | DWG. NO. 009-001-C48 | REVISION 3



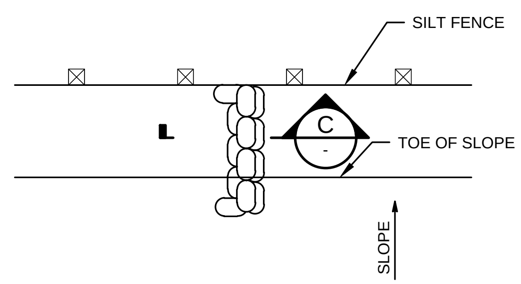
PLAN
TEMPORARY LINEAR SEDIMENT BARRIER (TYPE SILT FENCE)
NOT TO SCALE



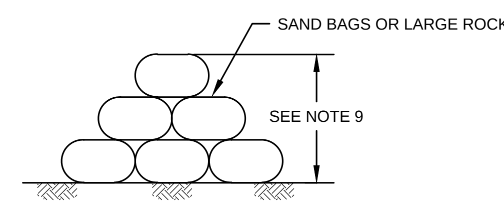
DETAIL A
NOT TO SCALE



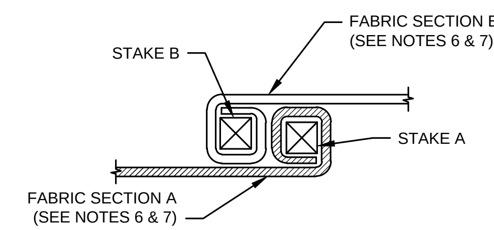
SECTION A - A
NOT TO SCALE



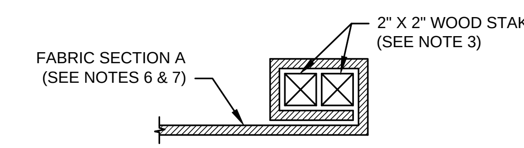
CROSS BARRIER DETAIL
NOT TO SCALE



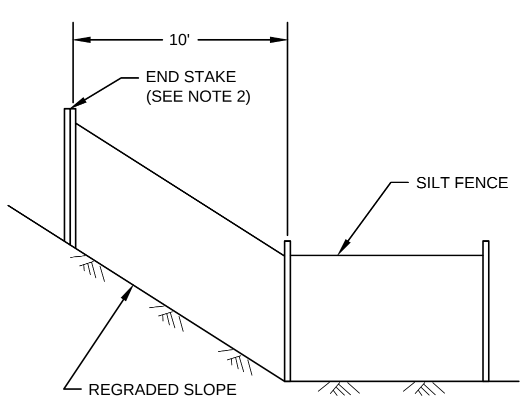
SECION C - C
NOT TO SCALE



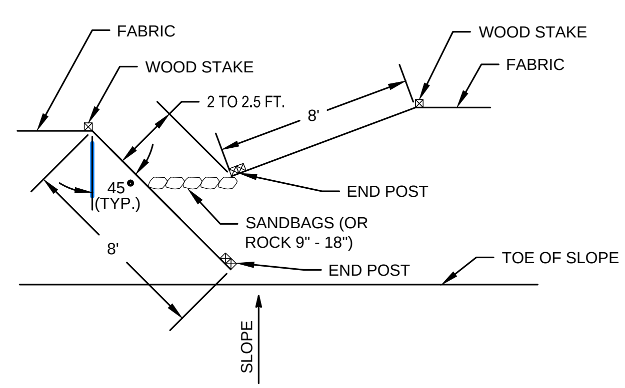
PLAN
POST AT JOINTS
NOT TO SCALE



JOINING SECTION DETAIL (TOP VIEW)
NOT TO SCALE



END DETAIL
NOT TO SCALE



PLAN
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)
NOT TO SCALE

NOTES:

1. CONSTRUCT THE LENGTH OF EACH REACH SO THAT THE CHANGE IN BASE ELEVATION ALONG THE REACH DOES NOT EXCEED 1/3 THE HEIGHT OF THE LINEAR BARRIER, IN NO CASE SHALL THE REACH LENGTH EXCEED 500 FT.
2. THE LAST 10 FT. OF FENCE SHALL BE TURNED UP SLOPE.
3. STAKE DIMENSIONS ARE NOMINAL AND DIMENSIONS SHOWN ARE TYPICAL.
4. DIMENSION MAY VARY TO FIT FIELD CONDITION.
5. STAKES SHALL BE SPACED AT 10 FT. MAXIMUM AND SHALL BE POSITIONED ON DOWNSTREAM SIDE OF FENCE.
6. STAKES TO OVERLAP AND FENCE FABRIC TO FOLD AROUND EACH STAKE ONE FULL TURN. SECURE FABRIC TO STAKE WITH AT LEAST 4 STAPLES.
7. STAKES SHALL BE DRIVEN TIGHTLY TOGETHER TO PREVENT POTENTIAL FLOW-THROUGH OF SEDIMENT AT JOINT. THE TOPS OF THE STAKES SHALL BE SECURE WITH WIRE.
8. FOR END STAKE, FENCE FABRIC SHALL BE FOLDED AROUND TWO STAKES ONE FULL TURN AND SECURE WITH 4 STAPLES.
9. CROSS BARRIERS SHALL BE A MINIMUM OF 1/3 AND A MAXIMUM OF 1/2 THE HEIGHT OF THE LINEAR BARRIER.
10. MAINTENANCE OPENINGS SHALL BE CONSTRUCTED IN A MANNER TO ENSURE SEDIMENT REMAINS BEHIND SILT FENCE.
11. SANDBAGS OR ROCK ROWS AND LAYERS SHALL BE OFFSET TO ELIMINATE GAPS.

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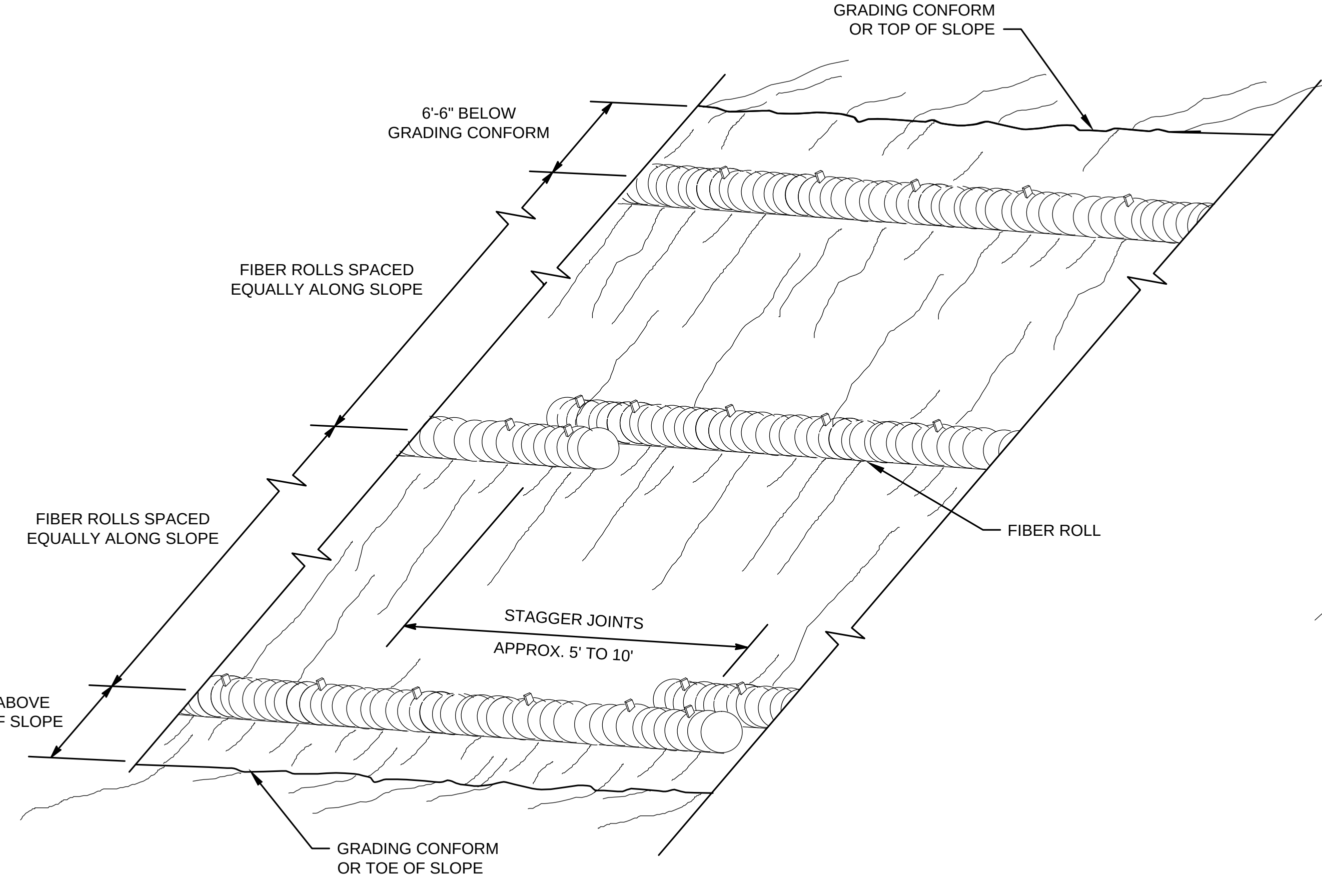
J.R. SIMPLOT COMPANY - CONDA MINE

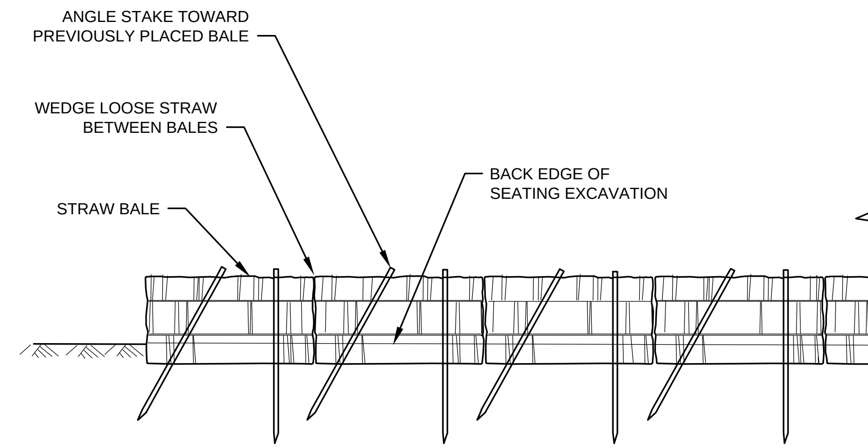
FIELD SCALE PLANT UPTAKE PILOT STUDY

EROSION CONTROL DETAILS
SILT FENCES

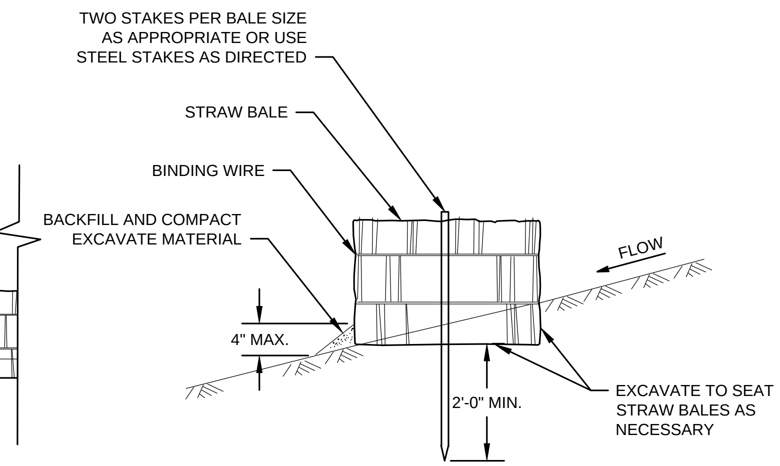
DATE JULY 2012 | DWG. NO. 009-001-C49 | REVISION 2



PERSPECTIVE
FIBER ROLL (TYPE 1)
NOT TO SCALE

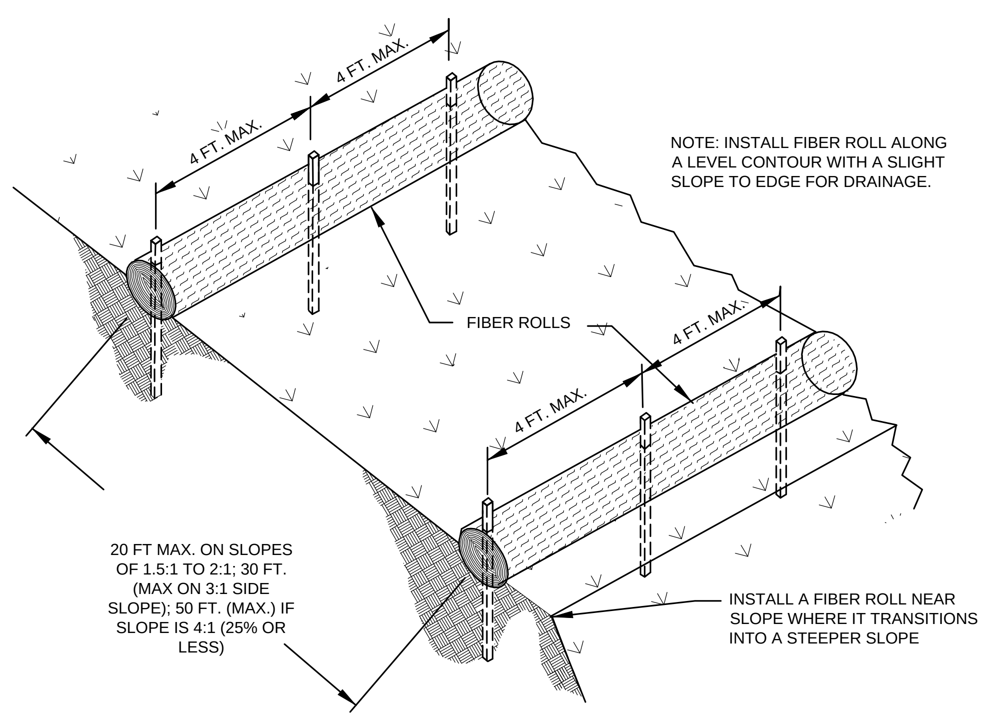


FRONT ELEVATION

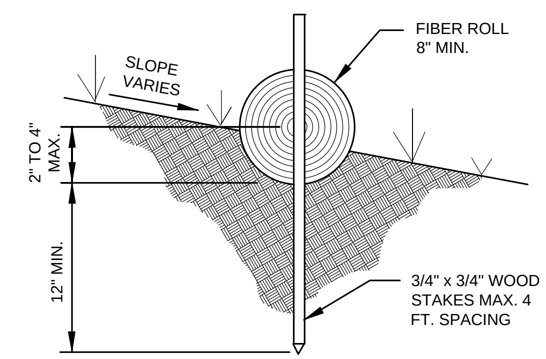


SECTION

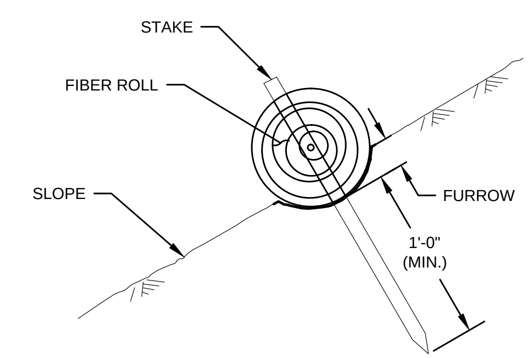
TYPICAL STRAW BALE BARRIER
NOT TO SCALE



TYPICAL FIBER ROLL INSTALLATION
NOT TO SCALE



ENTRENCHMENT DETAIL
NOT TO SCALE



SECTION
FIBER ROLL
(TYPE 1)
NOT TO SCALE

NOTES:

1. PLACEMENT OF FIBER ROLLS (STRAW WATTLES) AND STRAW BALES TO BE FIELD DIRECTED.
2. STRAW BALES MAY BE USED IN PLACE OF PERIMETER SILT FENCE.
3. FIBER ROLLS (STRAW WATTLES) SHALL BE USED BELOW AND ON SIDES OF TEST PLOT AREAS AND ELSEWHERE ON REGRADED SIDE SLOPES AS DIRECTED.

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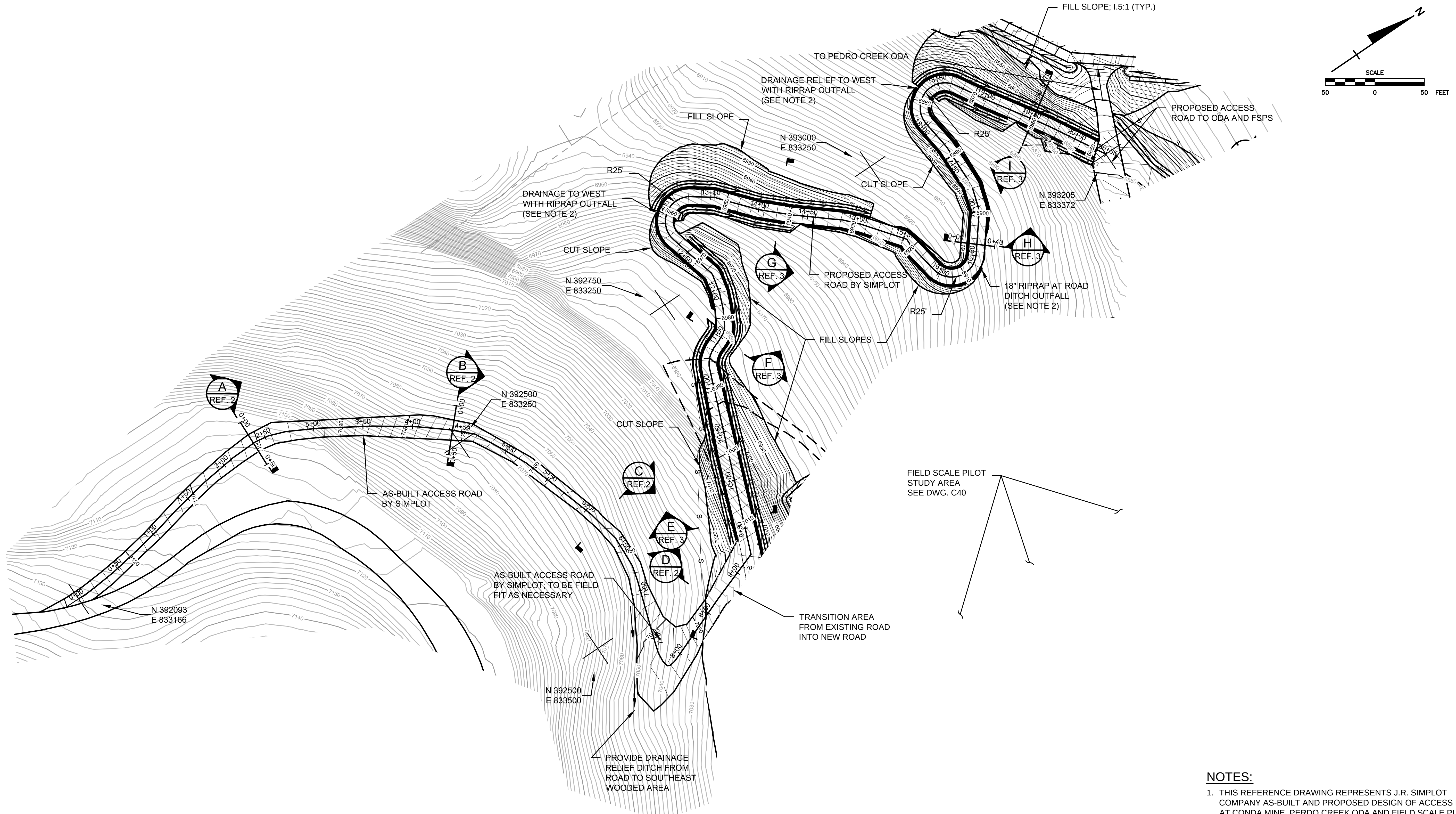
FILE NAME:	009-001-C50 .DWG

J.R. SIMPLOT COMPANY - CONDA MINE

FIELD SCALE PLANT UPTAKE PILOT STUDY

EROSION CONTROL DETAILS
FABRIC ROLLS - STRAW
WATTLES AND STRAW BALES

DATE JULY 2012 | DWG. NO. 009-001-C50 | REVISION 2



NOTES:

1. THIS REFERENCE DRAWING REPRESENTS J.R. SIMPLOT COMPANY AS-BUILT AND PROPOSED DESIGN OF ACCESS ROAD AT CONDA MINE, PERDO CREEK ODA AND FIELD SCALE PLANT UPTAKE STUDY AREA.
2. RIPRAP OUTFALLS SHALL BE 18" (D50=12"), 5-FT WIDE BY 10-FT LONG (TYP.), AND AS DIRECTED.

J.R. SIMPLOT COMPANY - CONDA MINE

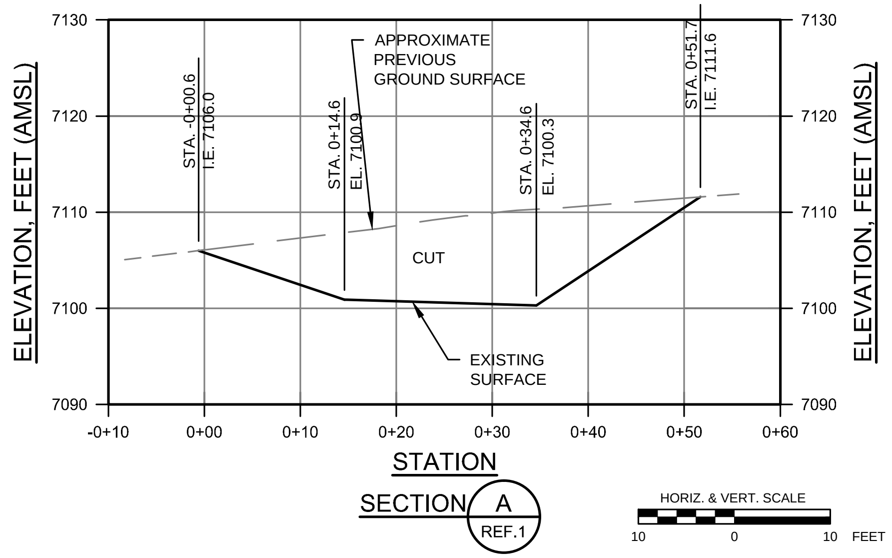
PEDRO CREEK

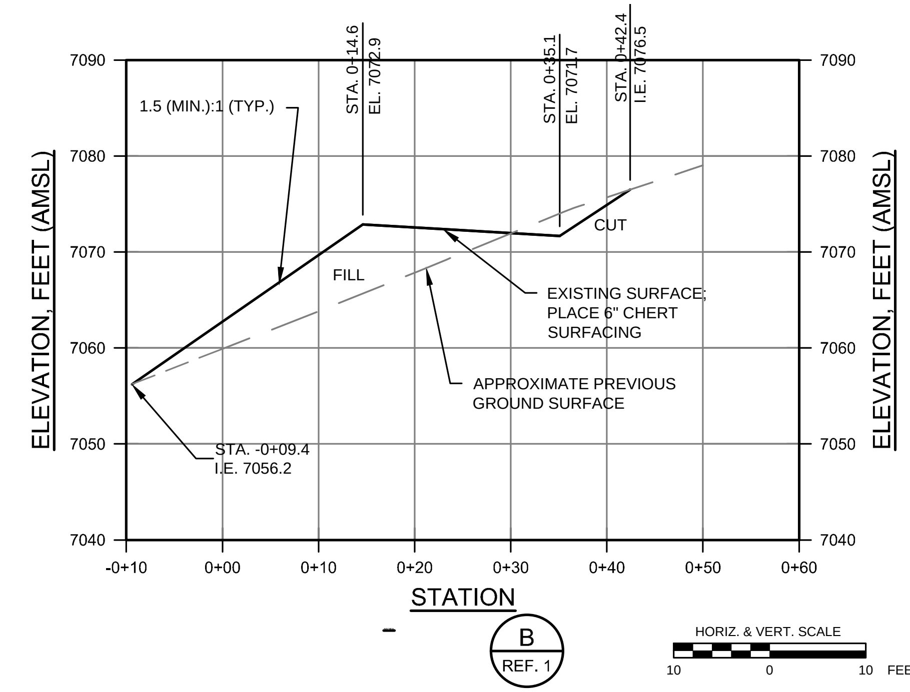
ODA AND FIELD SCALE PLANT UPTAKE PILOT STUDY AREA

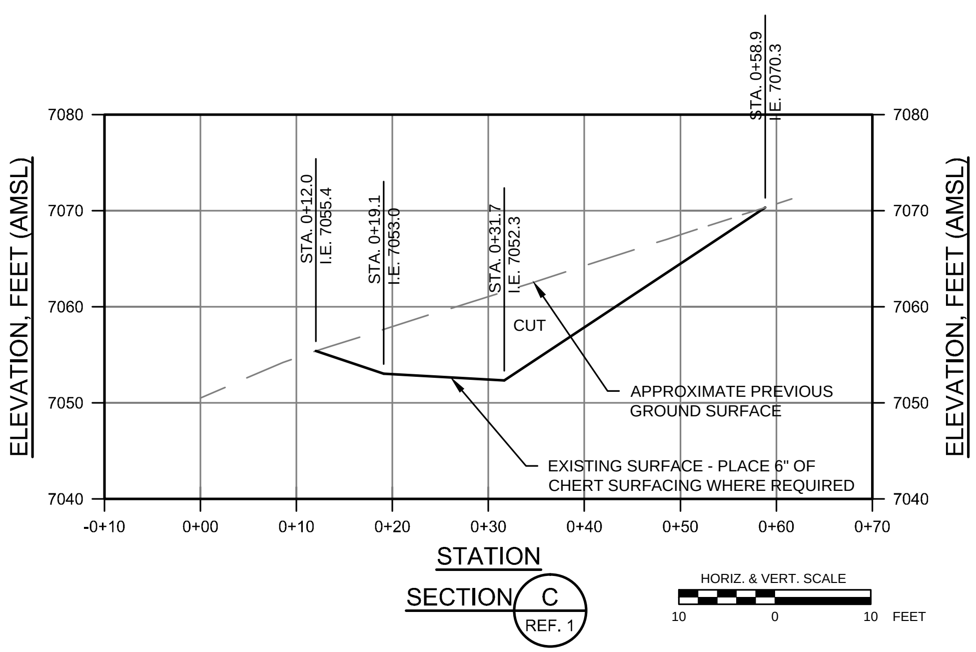
SIMPLOT ACCESS ROAD

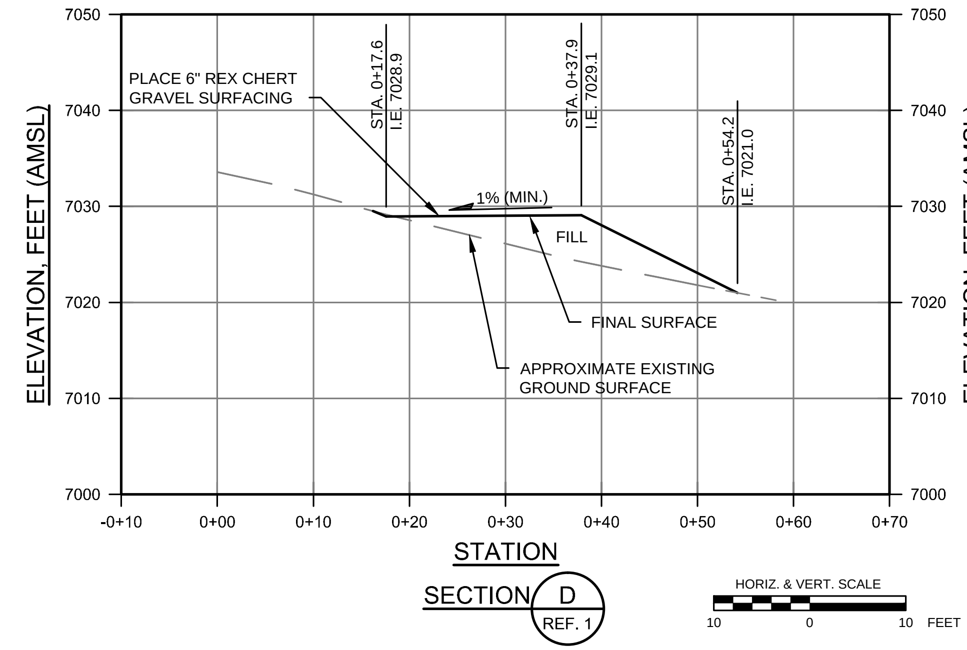
AS-BUILT AND PROPOSED PLAN

DATE JULY 2012	REFERENCE DWG. NO. REF. 1	REVISION 1





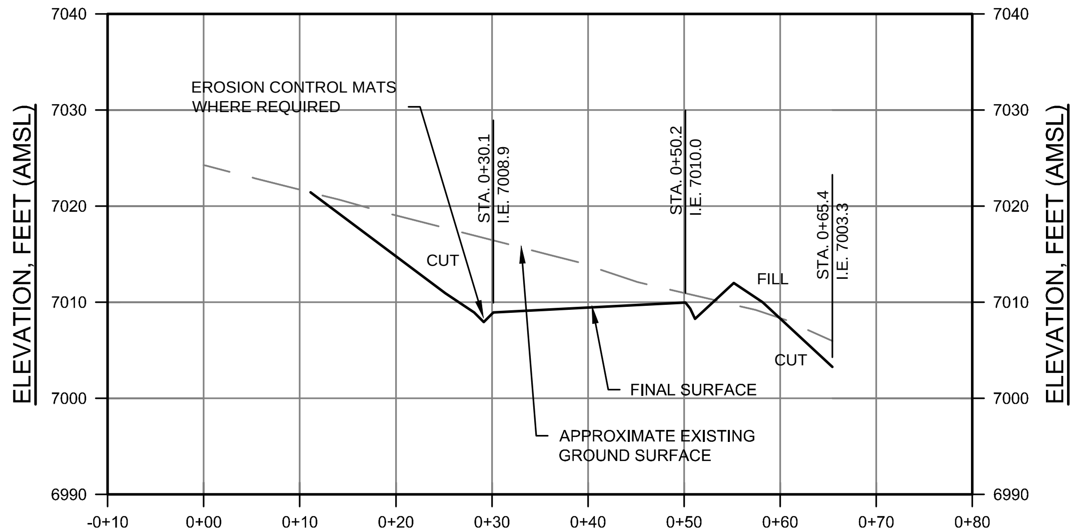




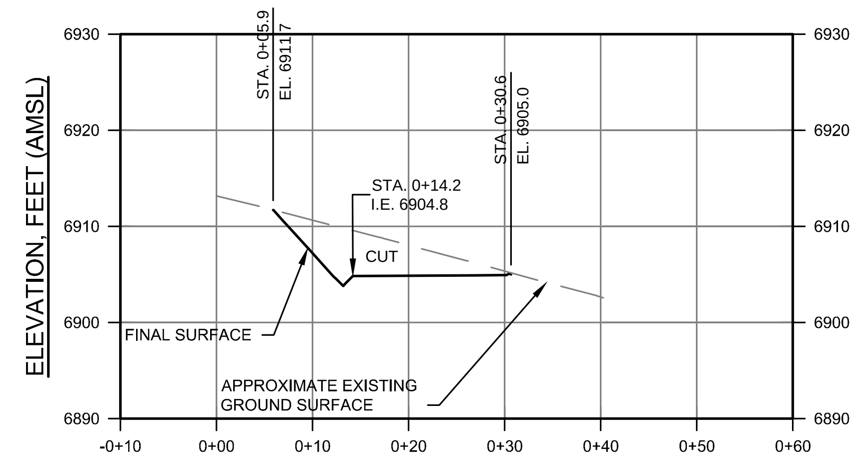
NOTES:

1. THIS REFERENCE DRAWING REPRESENTS J.R. SIMPLOT COMPANY AS-BUILT DESIGN OF ACCESS ROAD AT CONDA MINE, PERDO CREEK ODA AND FIELD SCALE PLANT UPTAKE STUDY AREA. SECTIONS A, B, C & D ONLY.
2. ROAD SURFACES SHALL HAVE 6" REX CHERT GRAVEL (2" MINUS) WHERE NOT ON ROCK CUT SURFACES.

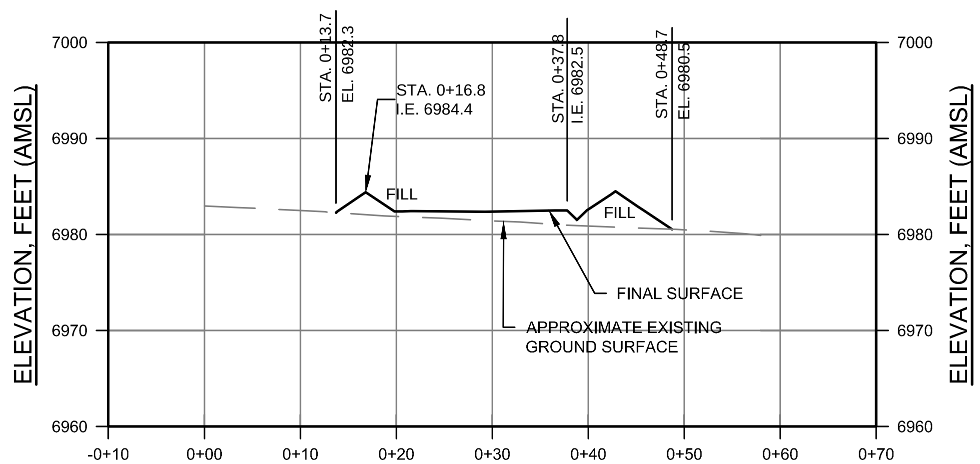
J.R. SIMPLOT COMPANY - CONDA MINE		
PEDRO CREEK ODA AND FIELD SCALE PLANT UPTAKE PILOT STUDY AREA		
SIMPLOT ACCESS ROAD AS-BUILT SECTIONS		
DATE JULY 2012	REFERENCE DWG. NO. REF. 2	REVISION 1



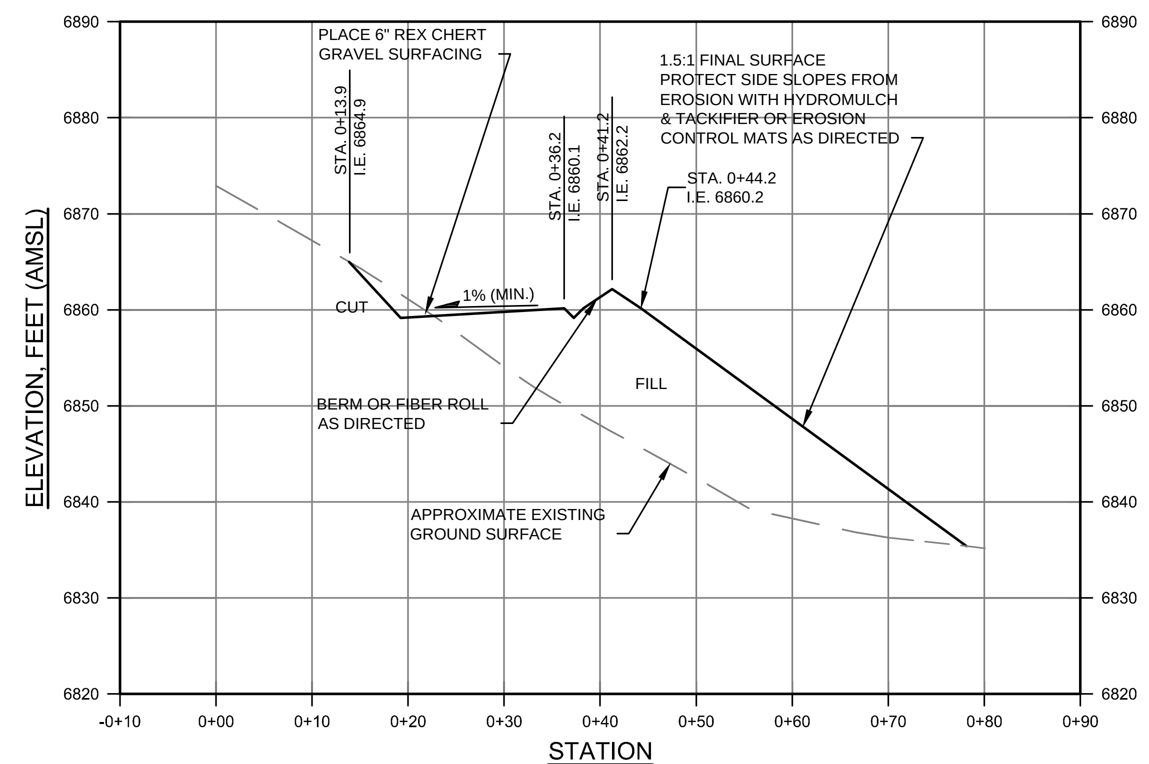
SECTION E
REF. 1



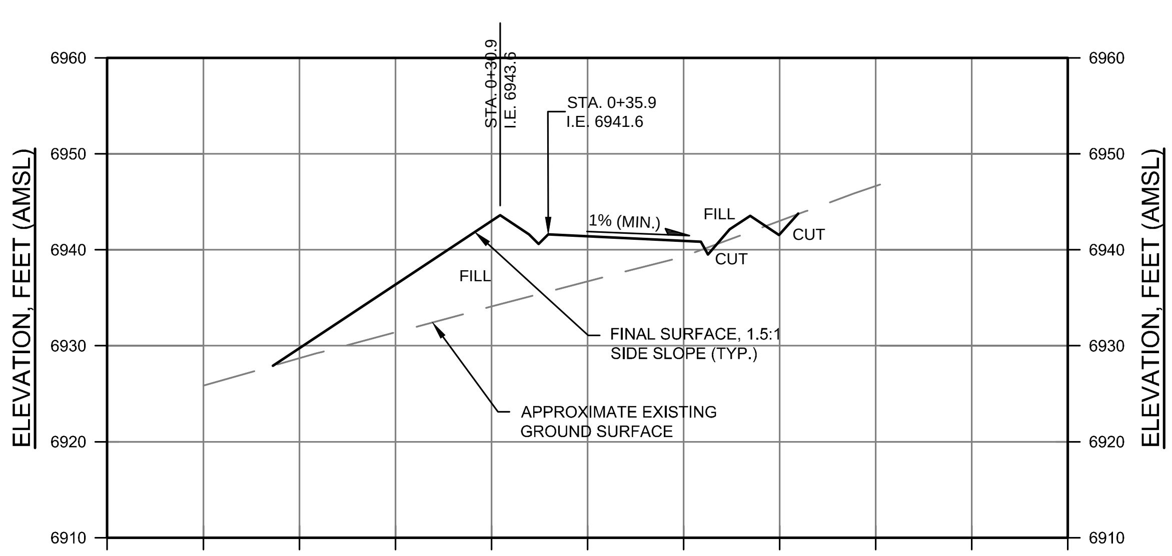
SECTION H
REF. 1



SECTION F
REF. 1



SECTION I
REF. 1

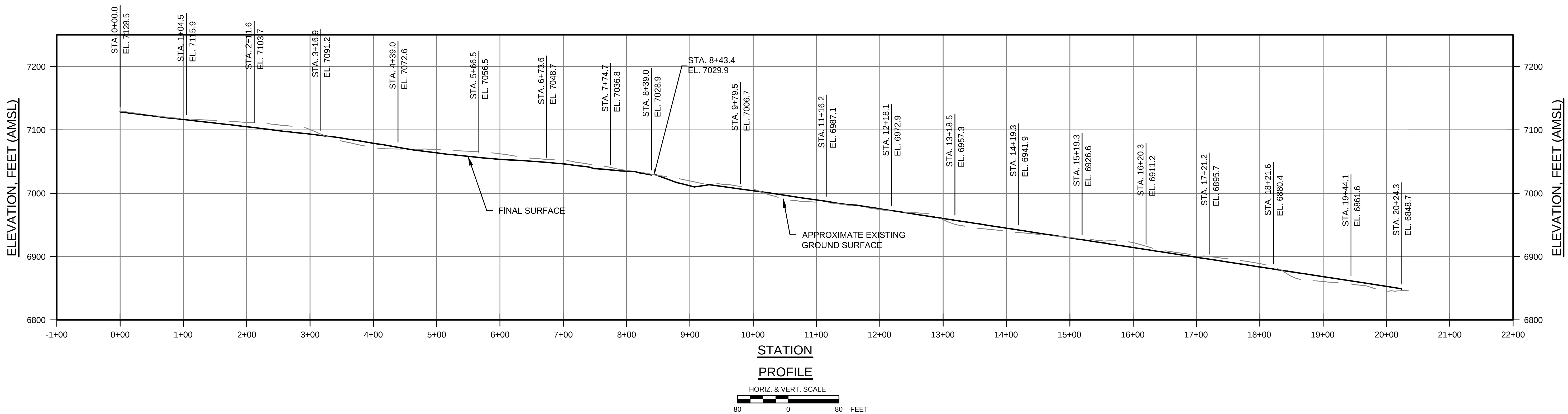


SECTION G
REF .1

NOTES:

1. THIS REFERENCE DRAWING REPRESENTS J.R. SIMPLOT COMPANY PROPOSED DESIGN OF ACCESS ROAD AT CONDA MINE, PERDO CREEK ODA AND FIELD SCALE PLANT UPTAKE STUDY AREA. SECTIONS E, F, G, H & I ONLY.
2. THE CUT SLOPES ARE DESIGNED AT 0.9H:1V AND THE FILL SLOPES ARE DESIGNED AT 1.5H:1V.

J.R. SIMPLOT COMPANY - CONDA MINE	
PEDRO CREEK ODA AND FIELD SCALE PLANT UPTAKE PILOT STUDY AREA	
SIMPLOT ACCESS ROAD PROPOSED SECTIONS	
DATE JULY 2012	REFERENCE DWG. NO. REF. 3 REVISION 1



NOTE:

1. THIS REFERENCE DRAWING REPRESENTS J.R. SIMPLOT COMPANY PROPOSED DESIGN OF ACCESS ROAD AT CONDA MINE, PERDO CREEK ODA AND FIELD SCALE PLANT UPTAKE STUDY AREA.

J.R. SIMPLOT COMPANY - CONDA MINE		
PEDRO CREEK ODA AND FIELD SCALE PLANT UPTAKE PILOT STUDY AREA		
SIMPLOT ACCESS ROAD PROPOSED PROFILE		
DATE JULY 2012	REFERENCE DWG. NO. REF. 4	REVISION 0