CLOSURE PLAN AND
POST-CLOSURE CARE AND MAINTENANCE PLAN

LOTS 1 AND 2, DRENNAN INDUSTRIAL CENTER
COLORADO SPRINGS, COLORADO

Prepared for:
Mr. Neil Olesky
Western Steel, Inc.
Colorado Springs, Colorado

Prepared by:
Souder, Miller & Associates
Lakewood, Colorado

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Senior Engineer

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Staff Civil Designer

COLORADO LICENSED
MICHAEL J. PRETTI
1-27-17
0048503
PROFESSIONAL ENGINEER

Project No. 1D25152
Date: January 27, 2017

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FIGURE 4 - Olesky Shingle

TABLE OF CONTENTS

Appendices

FIGURE 4 - Olesky Shingle

1.0 INTRODUCTION

1.1 Purpose

This Closure Plan and Post-Closure Care and Maintenance Plan (Plan), prepared for Lots 1 and 2 of the Drennan Industrial Center, Colorado Springs, Colorado, contains the Facility's closure requirements, steps necessary for closure of a shingle pile located at the site, and Post-Closure care and maintenance procedures. Mr. Neil Olesky, Property Owner, intends to pursue closure of the site in accordance with the provisions of the Colorado "Regulations Pertaining to Solid Waste Sites and Facilities," 6 CCR 1007-2 (Regulations), Subsections 2.5 and 3.5. The Closure Plan is presented in Section 2.0 of this document. As discussed in Sections 3.2 and 3.3 of this Closure Plan, waivers of groundwater monitoring and gas monitoring requirements will be requested herein (Appendix C).

Section 3.0 herein discusses Post-Closure care and site maintenance, which meets relevant requirements of section 2.6 and 3.6 of the Solid Waste Regulations, that will be performed following closure of the site.

Subsection 1.8 of the Regulations contains the associated financial assurance requirements.

1.2 Facility Information

Lots 1 and 2 of the Drennan Industrial Center, Filing No. 12, are located on Drennan Industrial Loop N in the Drennan Industrial Park, as recorded in Plat Book D-4 at Page 92 and as shown on the attached figures. Lot 1 contains approximately 1.01 acres (44,000 sq. ft.) and Lot 2 contains approximately 1.00 acres (43,700 sq. ft.). The site is at an elevation of 5,872 feet above mean sea level. Soils within the area have been mapped by USDA's Natural Resources Conservation Service (NRCS) and are classified within hydrologic group "A." See Appendix B for site soils information and mapping.

1.3 Project Background

The property is owned by Mr. Neil Olesky, owner of Olesky Investments, LLC of Greenwood Village, Colorado. In the early 1980s, the site was used for an asphalt plant. Mr. Olesky purchased the property in the late 1990s with the intent of using the entire property for his new business venture, Western Steel, a seller of new and used steel. However, only a portion of the property was needed for Western Steel and the remainder was leased to Western Scrap Processing from 2010 to 2011. Go Green Recycling, an asphalt shingle recycler from Kansas City, Missouri, leased the property for asphalt shingle storage in 2011, with the intent of removing the shingles for eventual recycling. However, legal issues between Olesky Investments and Go Green Recycling resulted in Go Green subsequently illegally abandoning the site and leaving Olesky Investments with a 32,000-ton stockpile of shingles on this approximately 2-acre parcel.

Mr. Olesky pursued proper disposal of the shingles in a licensed landfill, however that was found to be cost prohibitive. Souder, Miller & Associates (SMA) has prepared this Certificate of Designation (CD) application on behalf of Mr. Olesky. This CD application includes the following:

- Closure and post-closure financial assurance cost estimates and mechanism in accordance with Section 1.8 of the Regulations. The financial assurance information is submitted as a separate document that accompanies the CD application.
- A Closure Plan that meets the relevant requirements of Sections 2.5 and 3.5 of the Regulations is discussed in Section 2.0 of this document. The Closure Plan also includes a discussion regarding suspect asbestos-containing materials in accordance with the Act and Regulations.

FIGURE 4 - Olesky Shingle

- A Construction Quality Assurance and Quality Control Plan (CQAQC Plan) prepared in accordance with Section 3.3.3 of the Regulations is included herein as Appendix D.
- A Post-Closure Plan that meets the relevant requirements of Sections 2.6 and 3.6 of the Regulations is discussed in Section 3.0 of this document. Waiver requests for groundwater monitoring and gas monitoring are discussed in Sections 3.2 and 3.3 of this document. The waiver requests were prepared in accordance with Section 1.5 of the Regulations.
- The Colorado Environmental Covenants Act, C.R.S. § 25- 15-317 *et seq.*, requires either an Environmental Covenant or a Notice of Environmental Use Restriction ("Restrictive Notice") be placed on sites where waste is left in place [see C.R.S. § 25-15-320(2)]. The drafting of an Environmental Covenant or Restrictive Notice will be deferred until after the City of Colorado Springs makes a determination regarding the CD application. Section 3.6 of this document discusses the Environmental Covenant.

FIGURE 4 - Olesky Shingle

2.0 CLOSURE AND RECLAMATION

2.1 General Information

As discussed above, the property has been owned by Mr. Olesky since the late 1990s when it was purchased with the intention of using the entire property for Western Steel, a seller of new and used steel. Go Green Recycling leased a portion of the property for asphalt shingle storage and subsequent recycling in 2011, but Go Green abandoned the site leaving Olesky Investments with a 32,000-ton stockpile of shingles on this approximately 2-acre parcel.

Of the 32,000 tons of asphalt shingles on site, Mr. Olesky indicated that shingles from 2 roofs, at the most, had a paint coating containing asbestos. Mr. Olesky was told by Mr. Brian Long of CDPHE that no action to mitigate the potentially asbestos-containing shingles would be necessary unless these shingles were shredded. Mr. Olesky does not plan to shred shingles.

During any construction activities that will disturb the shingle pile, a Qualified Project Monitor (QPM), meeting the training requirements of 5.5.3(C) 1) through 4) of the Regulations, will be onsite to observe and document the segregation of suspect asbestos-containing materials. Please refer to Appendix C for a waiver request for 5.5.3(C) 5). Additionally, non-shingle materials such as drums, batteries, or containers with suspect material will be segregated and properly disposed of. Non-shingle material such as clean glass, metal, or wood, will not be segregated and will remain onsite.

2.2 Final Cover Design

The cover designed for this site will consist of the following:

- Regrading of the shingle pile
- Placement of a 3-foot thick cover consisting of:
  - 12 inches of foundation layer soil placed over the shingles
  - 18 inches of barrier layer consisting of low hydraulic conductivity ($\leq 1x10^{-5}$ cm/sec) clayey soil
  - 6 inches of topsoil
- Construction of a 4-foot wide grass buffer along the south edge of the site
- Placement of fertilizer, seed, and mulch.

Table 1
Components of the Final Cover

Component	***Soil Description***
Foundation Layer	1.0 foot of unspecified, non-organic fill
Barrier Layer	1.5 feet (minimum) with a compacted hydraulic conductivity of $1x10^{-5}$ cm/sec or less.
Vegetative Cover Layer	0.5 foot (minimum) capable of supporting the specified vegetation. This uppermost layer will be firm but not compacted to allow seeding with the appropriate post-closure vegetation species.

2.2.1 Containment Area and Cover Placement

A containment area will be created by excavation of an area approximately 45,000 square feet. The depth of the excavation will range between approximately 15 to 20 feet, which will allow for placement of the shingles and 3-foot thick final cover and blending into the existing grade.

FIGURE 4 - Olesky Shingle

Four piezometers to measure groundwater elevations were installed at the site. Figure No. 2 shows the locations of the piezometers, PZ- 1 through PZ-4. PZ-1 through 3 were installed in February 2016; PZ-4 was installed in July 2016. As measured in these piezometers, groundwater elevations (February 2016 to December 2016) are summarized below:

- PZ-1: maximum elevation – 5843.03 ft.; average 5842.57 ft.
- PZ-2: maximum elevation – 5843.96 ft.; average 5843.23 ft.
- PZ-3: maximum elevation – 5855.97 ft.; average 5853.60 ft.
- PZ-4: no water encountered at well bottom (5856.17 ft.)

Appendix F presents all piezometer depth readings measured to date, and Figure 1 displays the site's potentiometric surface based on the most recent, December 2016, piezometer measurements. Much of the yearly precipitation at the site occurs from May through August, which likely corresponds with the highest measured groundwater elevations, measured June 2016. Additionally, the Desert Research Institute reports the Colorado Springs Muni AP site received 129% of average precipitation from 2013 through 2015, 159% of average precipitation during 2015, and 139% of average precipitation from January through May 2016. Given the area's above average precipitation prior to June 2016, it is likely the groundwater elevations measured during June 2016 represent a reasonable maximum.

Based on the June 2016 groundwater elevations, the base of the excavation was set no lower than elevation 5859 ft., resulting in a groundwater separation distance of at least 3 feet in the area of PZ-4, but likely greater as no water was encountered in PZ-4 at the well bottom (elevation 5856.17 ft.).

Following shingle grading, a 6-inch foundation layer will be placed over the shingles to create a more stable and uniform surface for placement of the overlying 18-inch thick low hydraulic conductivity barrier layer. The barrier layer soil will be placed in loose lifts, not to exceed 8 inches in thickness, and compacted to attain maximum 6-inch thick lifts. Testing of the in-place barrier layer will be performed in accordance with the CQAQCP (Appendix D) to document that the proper physical properties of the barrier layer have been achieved.

As areas of barrier layer are completed and certified, the 6-inch thick vegetative layer, or topsoil layer, will be placed. The vegetative layer will be capable of sustaining the specified vegetation. It may be necessary to roughen the compacted soil surface prior to placement of the topsoil layer to allow adequate binding with the underlying soil; however, this work will be performed in such a manner that will not compromise the integrity and function of the underlying barrier layer.

2.2.2 Seedbed Preparation and Seeding

The seedbed shall be well settled and firm, but friable enough that seed can be placed at depths of 0.25 to 0.75 inch. The seedbed shall be free of weeds. Soils above the infiltration layer that have been compacted by traffic or equipment shall be tilled to break up layers that could restrict rooting depth. These tilled areas shall then be slightly compacted to provide a firm seed bed. Tillage operations shall be conducted primarily across the slope (on the contour), taking care not to till into the compacted infiltration layer. Seed shall be hand broadcast or drill seeded, depending on the application area size and accessibility, and lightly raked to incorporate into the seedbed.

The species to be seeded and the seeding rates are listed in Table 2. These species were selected in conjunction with Bureau of Land Management recommendations, based on species compatibility with the climate, integrity of the cover, and surrounding vegetation and soils. The seeding rates presented in Table 2 are based on pure live seed (PLS); therefore, the actual amount of seed applied should be based on the percent purity and germination of the seed supplied. Seeding should be conducted between March and May for the species selected given the climate of the area.

FIGURE 4 - Olesky Shingle

Table 2
Seed Mixture for Reclamation of Disturbed Areas

Species	*PLS lbs./acre*
Blue grama (Bouteloua gracilis)	1.8
Sideoats grama (Bouteloua curtipendula)	2.0
Western wheatgrass (Agropyron smithii)	6.0
Buffalo grass (Buchloe dactyloides)	6.0
Blanketflower (Gaillardia aristata)	0.2
Gayfeather (Liatris punctate)	0.1
Purple Prairie Clover (Petalostamum purpurreum)	0.1
Prairie Coneflower (Ratibida columnaris)	0.06
Little Bluestem (Schizachyrium scoparium)	1.4
Sand Dropseed (Sporobolus cryptandrus)	0.1
Green Needlegrass (Stipa viridula)	0.5
Total:	18.26

2.2.3 Fertilization

Fertilizer application rates will be determined based on the fertilizer manufacturer's recommended application rate or soil testing performed on potential soils, and on the seed mix specified in Section 2.2.2 of this Closure Plan. Application of fertilizer and mulch shall be performed by hydromulch procedures.

2.2.4 Erosion and Stormwater Control

The seedbed will be protected from wind and water erosion prior to establishment of permanent vegetation by the application of hydromulch following seeding.

Reclaimed areas shall be protected from grazing and trampling. Weeds shall be controlled by mechanical means (e.g., mowing) as appropriate during seedling establishment. Care shall be taken not to damage seedlings during mowing operations.

Long-term erosion control shall be accomplished by maintenance of the specified vegetation on the cover.

Given the shallow slopes of the cover (generally 1.5 percent to 3.6 percent), no permanent stormwater features have been designed for this project. Stormwater will generally be taken up by the cover vegetation or sheet flow to the south and east. A 4-foot wide grass buffer will be constructed along the south edge of the cover area, along with a 10-foot landscape setback to be populated as required by the City of Colorado Springs.

2.3 Closure Schedule and Notification

Final closure activities will commence upon issuance of the CD. Closure activities will be completed within 180 calendar days following the commencement of closure activities. Mr. Olesky will notify CDPHE (in writing) 30 calendar days in advance of the closure.

Following closure, an Environmental Covenant will be placed on the property deed (or on some other instrument that is normally examined during title search), which notifies any potential purchaser of the property's past use and that its future use is restricted by CDPHE regulations. CDPHE will be notified that this notation has been recorded and a copy of the notification will be placed in the operating record.

FIGURE 4 - Olesky Shingle

3.0 POST-CLOSURE CARE AND SITE MAINTENANCE

3.1 General Requirements

Post-closure care and maintenance will be performed, as needed, based on routine inspections of the site by the Owner or Owner's representative. Post-closure care of the site shall include at a minimum:

- Preventing nuisance conditions, e.g., potential litter, and inspection of access restrictions.
- Maintaining the integrity and effectiveness of the final cover by inspecting for and repairing as necessary:
  - surface soil cracking
  - ponding
  - erosion
  - proper slope
  - proper drainage
  - litter
  - vegetative cover conditions
  - fencing
  - animal burrows and damage

Post-closure care will be conducted for a minimum of thirty (30) years. The length of the post-closure care period may be decreased or increased by the CDPHE after consultation with the local governing body having jurisdiction, dependent upon the protection of human health and the environment.

3.2 Groundwater Monitoring

A waiver to exempt this site from groundwater monitoring, prepared in accordance with Section 1.5 of the Regulations, has been submitted under separate cover (Appendix C).

3.3 Gas Monitoring

A waiver to exempt this site from gas monitoring, prepared in accordance with Section 1.5 of the Regulations, has been submitted under separate cover (Appendix C).

3.4 Site Inspections

Inspection of the site shall be conducted on a semi-annual basis beginning after closure is complete. Any deficiencies encountered during the inspections shall be recorded, and the necessary repairs shall be made. An inspection form is included in Appendix E. The name, address, and telephone number of the person or office to contact about the facility during the post-closure period will be provided to CDPHE.

Items to be inspected include, but are not limited to:

- The integrity of the vegetation.
- The integrity of the final cover regarding erosion, slumping, cracking, damage due to equipment or animals, etc.
- The integrity of the fencing, gates, and all locks to identify any tampering or faulty equipment.
- The presence of illegally dumped refuse.

Inspection records will be retained by Mr. Neil Olesky and an annual report presenting the results of the routine inspections will be generated and submitted to CDPHE. Any deficiencies of the above items will be noted in the report, along with the action(s) taken to correct the noted deficiencies.

FIGURE 4 - Olesky Shingle

3.5 Post-Closure Land Use

There are currently no plans for use of the facility following closure other than an undeveloped, minimally used site. It should be noted, however, there are many potential uses for the closed area that will not damage or negatively affect the environmental integrity of the facility. Prior to any use other than open space, a description of the planned uses of the property during the post-closure period will be provided to CDPHE. Such uses shall not disturb the integrity of the final cover or any components of the containment system unless necessary to comply with the requirements in the Regulations.

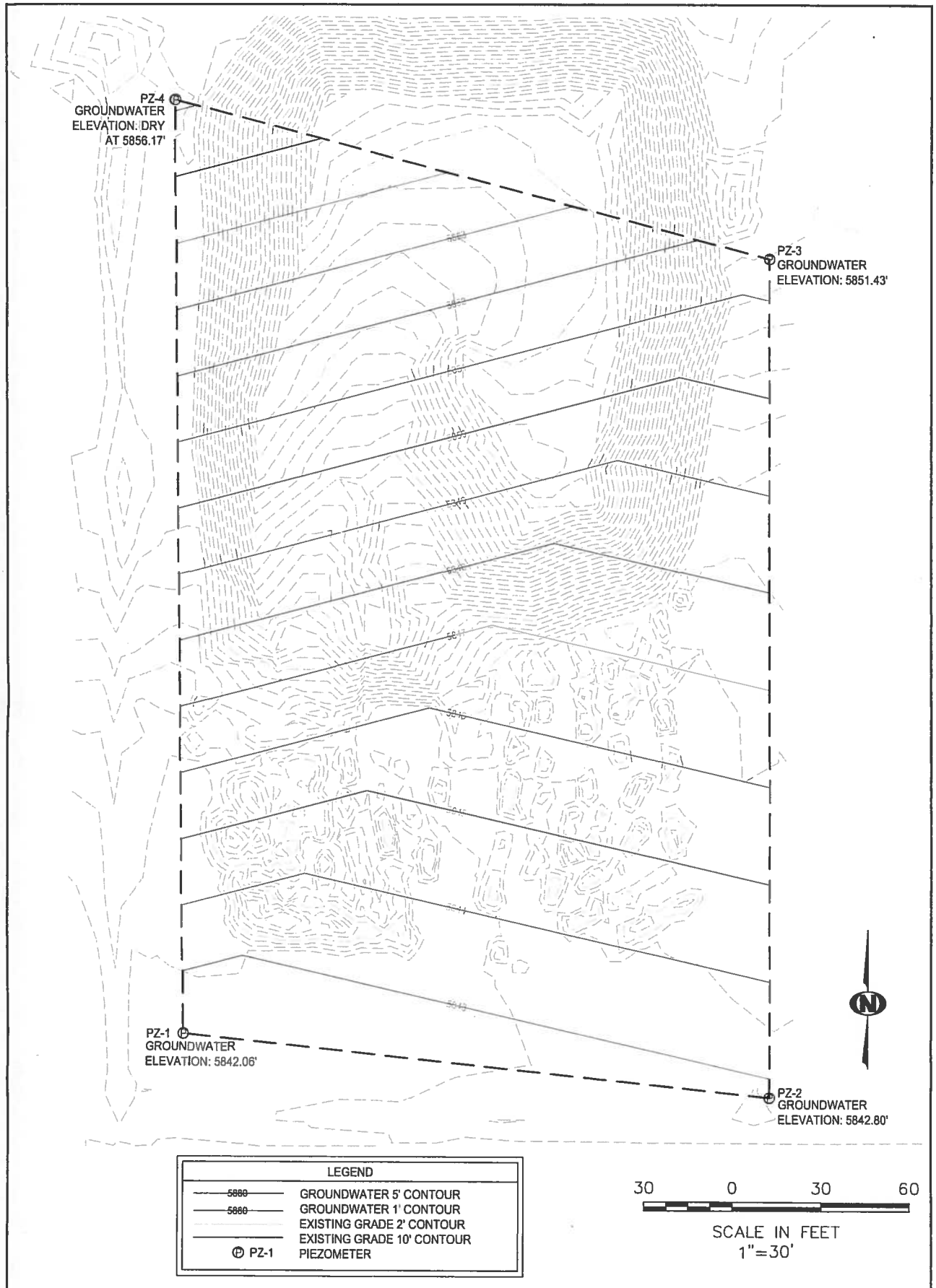
3.6 Environmental Covenant

An Environmental Covenant will be placed on the deed notifying any potential purchaser that the property has a shingle stockpile on-site. The drafting of the Environmental Covenant will be deferred until after the City of Colorado Springs makes a determination regarding the CD application.

3.7 Financial Assurance Plan

The Financial Assurance Plan will be maintained as a separate document to the EDOP. The plan will be submitted after the CD has been approved.

FIGURE 4 - Olesky Shingle



CITY FILE NO.: CPC UV 14-00126

SOUDER, MILLER & ASSOCIATES
8000 West Fourteenth Avenue
Lakewood, CO 80214

T-BONE CONSTRUCTION COLORADO SPRINGS, CO

POTENTIOMETRIC SURFACE AS OF 16 DECEMBER 2016
DEVELOPMENT PLAN FOR USE VARIANCE
3320 & 3330 DRENNAN INDUSTRIAL LOOP N.
COLORADO SPRINGS, COLORADO

Designed	Drawn	Checked
DC	GC	MJP

Date: 4 JANUARY 17
Scale: Horiz: 1" = 30' Vert:
Project No: 1025152

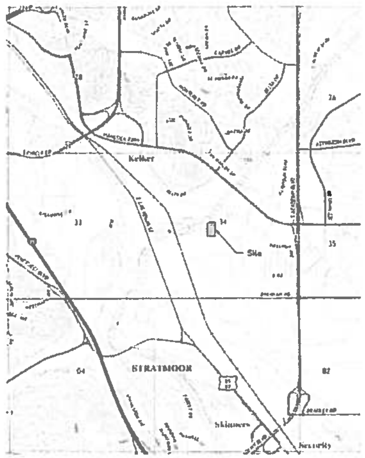
FIGURE 4 - Olesky Shingle

Appendix A

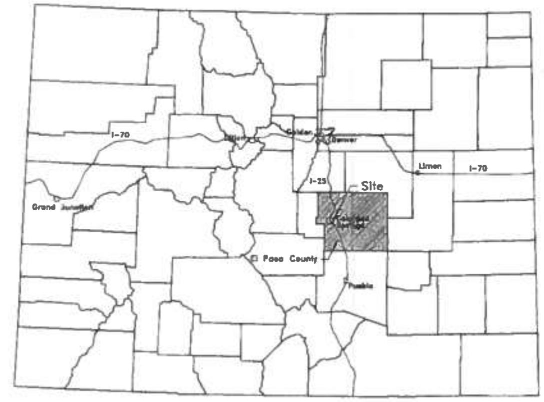
Site Map and Statements

FIGURE 4 - Olesky Shingle

SHINGLE PILE IMPOUNDMENT DESIGN
LOTS 1 & 2
DRENNAN INDUSTRIAL CENTER, FILING NO. 12
COLORADO SPRINGS, COLORADO
CPC UV 14-00126



Vicinity Map



Colorado

STANDARD NOTES

1. ANY LAND DISTURBANCE BY ANY OWNER, DEVELOPER, BUILDER, CONTRACTOR, OR OTHER PERSON SHALL COMPLY WITH THE BASIC GRADING, EROSION AND STORMWATER QUALITY CONTROL REQUIREMENTS AND GENERAL PROHIBITIONS NOTED IN THE DRAINAGE CRITERIA MANUAL VOLUME II.
2. NO CLEARING, GRADING, EXCAVATION, FILLING, OR OTHER LAND DISTURBING ACTIVITIES SHALL BE PERMITTED UNTIL SIGNOFF AND ACCEPTANCE OF THE GRADING PLAN AND EROSION AND STORMWATER QUALITY CONTROL PLAN IS RECEIVED FROM ENGINEERING DEVELOPMENT REVIEW DEPARTMENT (EDRD).
3. THE INSTALLATION OF THE FIRST LEVEL OF TEMPORARY EROSION CONTROL FACILITIES AND BMP'S SHALL BE INSTALLED AND INSPECTED PRIOR TO ANY EARTH DISTURBANCE OPERATIONS TAKING PLACE. CALL CITY STORMWATER INSPECTIONS, 385-5980, 48 HOURS PRIOR TO CONSTRUCTION.
4. SEDIMENT (MUD AND DIRT) TRANSPORTED ONTO A PUBLIC ROAD, REGARDLESS OF THE SIZE OF THE SITE, SHALL BE CLEANED IMMEDIATELY.
5. CONCRETE WASH WATER SHALL NOT BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
6. SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN TWENTY-ONE (21) CALENDAR DAYS AFTER FINAL GRADING OR FINAL EARTH DISTURBANCE HAS BEEN COMPLETED. DISTURBED AREAS AND STOCKPILES WHICH ARE NOT AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN THIRTY (30) DAYS SHALL ALSO BE MULCHED WITHIN TWENTY-ONE (21) DAYS AFTER INTERIM GRADING. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN SIXTY (60) DAYS SHALL ALSO BE SEEDED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND BMP'S SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED.
7. THE GRADING AND EROSION CONTROL PLAN WILL BE SUBJECT TO RE-REVIEW AND RE-ACCEPTANCE BY EDRD SHOULD ANY OF THE FOLLOWING OCCUR: GRADING DOES NOT COMMENCE WITHIN TWELVE (12) MONTHS OF THE CITY ENGINEER'S ACCEPTANCE OF THE PLAN, A CHANGE IN PROPERTY OWNERSHIP, PROPOSED DEVELOPMENT CHANGES, OR PROPOSED GRADING REVISIONS.
8. THE PLAN SHALL NOT SUBSTANTIALLY CHANGE THE DEPTH OF COVER, OR ACCESS EXISTING UTILITY LINES. ACCEPTANCE OF THIS PLAN DOES NOT CONSTITUTE APPROVAL TO GRADE IN ANY UTILITY EASEMENT OR RIGHT-OF-WAY. APPROVALS TO GRADE WITHIN UTILITY EASEMENTS MUST BE OBTAINED FROM THE APPROPRIATE UTILITY COMPANY. IT IS NOT PERMISSIBLE FOR ANY PERSON TO MODIFY THE GRADE OF THE EARTH ON ANY COLORADO SPRINGS UTILITIES EASEMENT OR UTILITY RIGHT-OF-WAY WITHOUT THEIR WRITTEN APPROVAL. THE PLAN SHALL NOT INCREASE OR DIVERT WATER TOWARDS UTILITY FACILITIES. ANY CHANGES TO EXISTING UTILITY FACILITIES TO ACCOMMODATE THE PLAN MUST BE APPROVED BY THE AFFECTED UTILITY OWNER PRIOR TO IMPLEMENTING THE PLAN. THE COST TO RELOCATE OR PROTECT EXISTING UTILITIES OR TO PROVIDE INTERIM ACCESS IS THE APPLICANT'S EXPENSE.
9. CONSTRUCTION TIMING:
   - ANTICIPATED STARTING AND COMPLETION TIME PERIOD OF SITE GRADING: FALL / WINTER 2016
   - EXPECTED DATE ON WHICH THE FINAL STABILIZATION WILL BE COMPLETED: SPRING / SUMMER 2017
10. ZONING: M-2/ss
11. PROPOSED USE: LANDFILL
12. SITE AREA: 2.1 acres
13. PARKING: N/A
14. RECEIVING WATERS: SAND CREEK DRAINAGE BASIN

DEVELOPER'S/OWNER'S STATEMENT

THE OWNER WILL COMPLY WITH THE REQUIREMENTS OF THE EROSION AND STORMWATER QUALITY CONTROL PLAN. I ACKNOWLEDGE THE RESPONSIBILITY TO DETERMINE WHETHER THE CONSTRUCTION ACTIVITIES ON THESE PLANS REQUIRE COLORADO DISCHARGE PERMIT SYSTEM (CDPS) PERMITTING FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY.

DEVELOPER/OWNER SIGNATURE ______________________

NAME OF DEVELOPER/OWNER: NEIL OLESKY
DATE ______________
DBA: ______________________
PHONE: 719.392.8821
TITLE: OWNER
EMAIL: NEIL@WESTERNSTEELCS.COM
ADDRESS: 3350 DRENNAN INDUSTRIAL LOOP N.
COLORADO SPRINGS, CO 80910

ENGINEER'S STATEMENT

THIS EROSION CONTROL/GRADING PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. IF SUCH WORK IS PERFORMED IN ACCORDANCE WITH THE GRADING AND EROSION CONTROL PLAN, THE WORK WILL NOT BECOME A HAZARD TO LIFE AND LIMB, ENDANGER PROPERTY, OR ADVERSELY AFFECT THE SAFETY, USE, OR STABILITY OF A PUBLIC WAY, DRAINAGE CHANNEL, OR OTHER PROPERTY.

REGISTERED ENGINEER'S SIGNATURE ______________________

NAME OF REGISTERED ENGINEER: MICHAEL J. PRETTI
COMPANY: SOUDER, MILLER AND ASSOCIATES
PHONE: 303.239.9011
ADDRESS: 8000 W. 14TH AVE, LAKEWOOD, CO 80214
EMAIL: MIKE.PRETTI@SOUDERMILLER.COM
FAX.303.239.0745

CITY OF COLORADO SPRINGS GRADING AND EROSION CONTROL REVIEW

THIS GRADING PLAN IS FILED IN ACCORDANCE WITH SECTION 7.7.1503 (ENACTED AS ORD. 82-56) OF THE CODE OF THE CITY OF COLORADO SPRINGS, 2001, AS AMENDED. EROSION CONTROL IS REVIEWED IN ACCORDANCE WITH THE DRAINAGE CRITERIA MANUAL, VOL. 1(OCTOBER 1994) AND VOL. 2(AUG. 2002), LATEST REVISIONS

______________________ DATE: ______________
FOR THE CITY ENGINEER

CITY FILE NO.: CPC UV 14-00126

SOUDER, MILLER & ASSOCIATES
Engineering • Environmental • Surveying
Serving the Southwest & Rocky Mountains
8000 West Fourteenth Avenue
Lakewood, CO 80214
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T-BONE CONSTRUCTION — COLORADO SPRINGS, CO

SITE MAP AND STATEMENTS
DEVELOPMENT PLAN FOR USE VARIANCE
3320 & 3330 DRENNAN INDUSTRIAL LOOP N.
COLORADO SPRINGS, COLORADO

NOT FOR CONSTRUCTION 1/2017
THIS DRAWING IS INCOMPLETE AND NOT TO BE USED FOR CONSTRUCTION UNLESS IT IS STAMPED SIGNED AND DATED

Designed	Drawn	Checked
DC	DC	MJP

Date: 23 Jan 17
Scale: Horiz: 1" = 2000' Vert
Project No. 1D25152
Sheet 1 of 5

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FIGURE 4 - Olesky Shingle

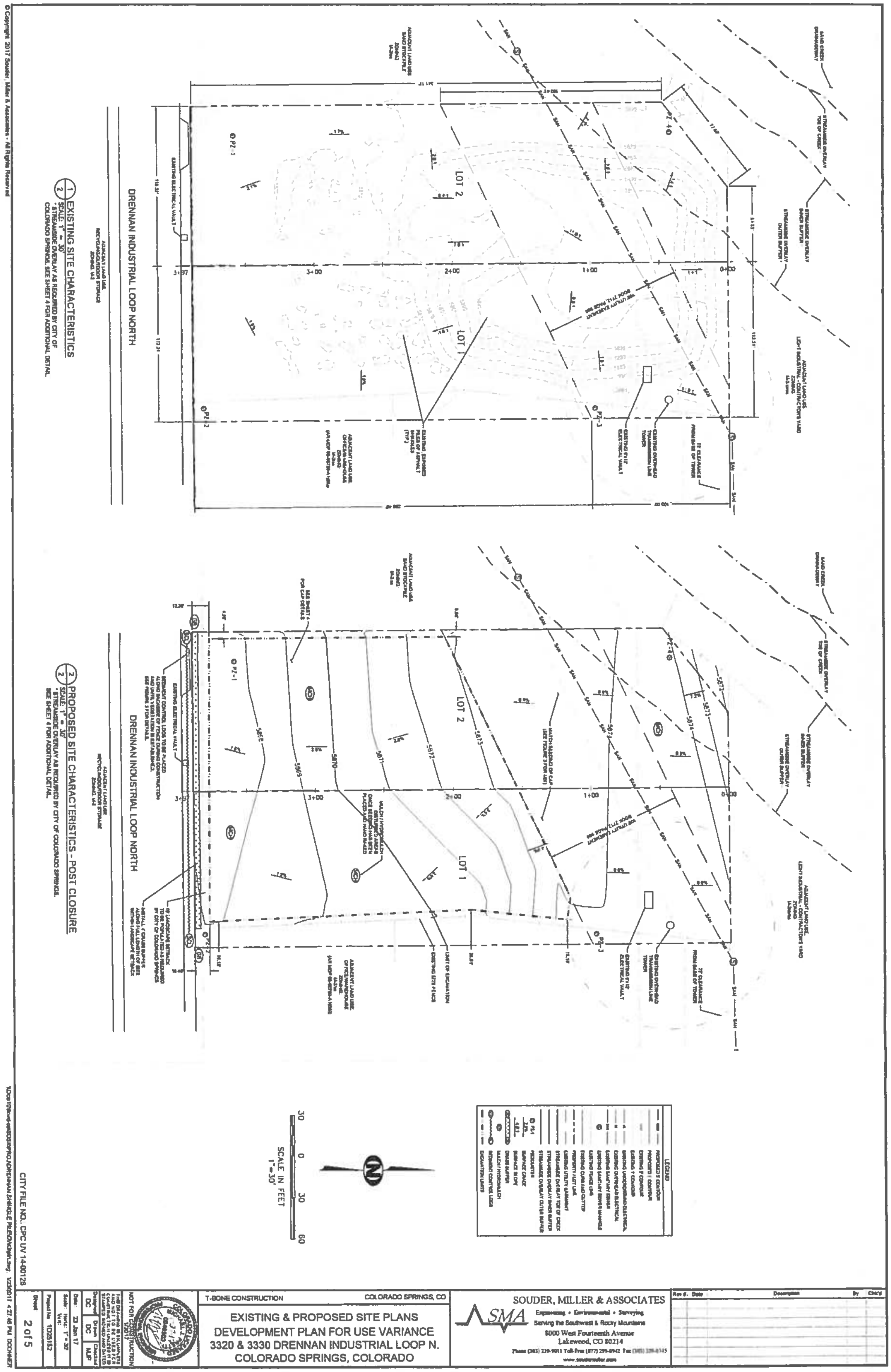
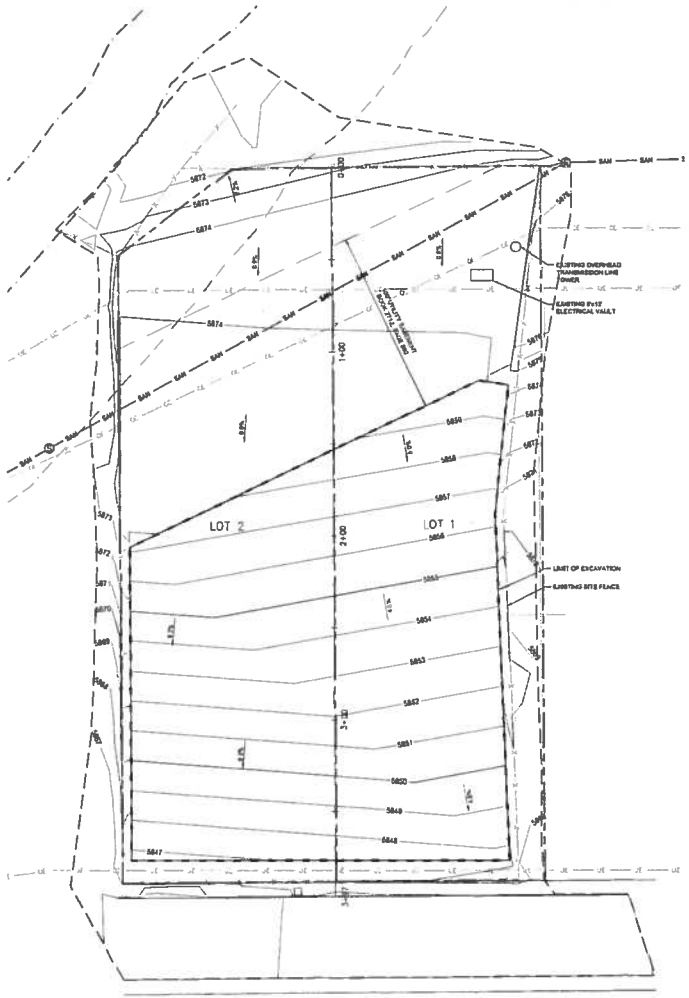
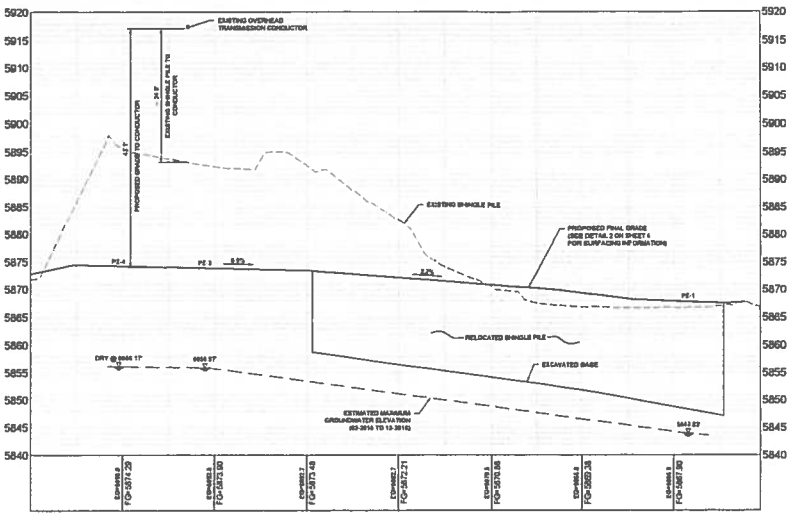


FIGURE 4 - Olesky Shingle



1 / 3 EXCAVATION PLAN
SCALE: 1" = 30'



2 / 3 CROSS SECTION AT MIDLINE OF SITE
SCALE: 1" = 30' HORIZONTAL
1" = 10' VERTICAL

LEGEND
- PROPOSED 5' CONTOUR
- PROPOSED 1' CONTOUR
- EXISTING UNDERGROUND ELECTRICAL
- EXISTING OVERHEAD ELECTRICAL
- EXISTING SANITARY SEWER
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FENCE LINE
- EXISTING CURB AND GUTTER
- PROPERTY / LOT LINE
- EXISTING UTILITY EASEMENT
- STREAMSIDE OVERLAY EDGE OF CREEK
- STREAMSIDE OVERLAY SIDE BUFFER
- STREAMSIDE OVERLAY OUTER BUFFER
- SURFACE GRADE
- EXCAVATION LIMITS

30 0 30 60
SCALE IN FEET
1"=30'

CITY FILE NO. CPC UV 14-00128

SOUDER, MILLER & ASSOCIATES
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8000 West Fourteenth Avenue
Lakewood, CO 80214
Phone (303) 239-8811 Toll-Free (877) 239-8042 Fax (303) 239-8787
www.soudermiller.com

No. #	Date	Description	By	Chk'd

T-BONE CONSTRUCTION
COLORADO SPRINGS, CO

EXCAVATION PLAN & CROSS SECTION
DEVELOPMENT PLAN FOR USE VARIANCE
3320 & 3330 DRENNAN INDUSTRIAL LOOP N.
COLORADO SPRINGS, COLORADO

NOT FOR CONSTRUCTION
1/2017

THIS DRAWING IS INCOMPLETE AND NOT TO BE USED FOR CONSTRUCTION UNLESS IT IS STAMPED, SIGNED AND DATED

Designed	Drawn	Checked
DC	DC	MJP

Date 23 Jan 17
Scale Horiz 1" = 30'
Vert 1" = 10'
Project No. 10235152
Sheet 3 of 5

N:\Dcc10\files4-ca\SDS\PROJ\DRENNAN SHINGLE PILE\DWG\pre-dst.dwg, 1/23/2017 5:04:36 PM GDC

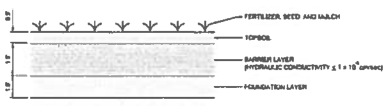
FIGURE 4 - Olesky Shingle

Short Grass Prairie Mix

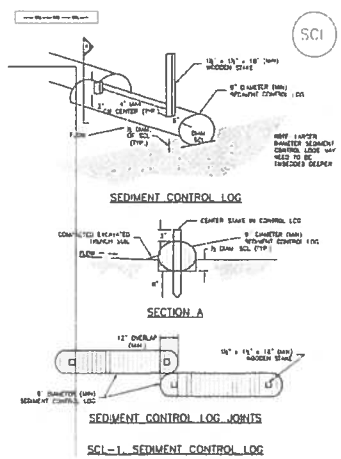
Genus species	Common Name	Lb/ac (PLS)*	percent PLS/ac	Seeds/lb
Agropyron smithii	Western Wheatgrass	6	32.66	110,000
Bouteloua gracilis	Blue Grama	1.8	9.86	825,000
Bouteloua curtipendula	Sideoats Gramma	2	10.95	190,000
Buchloe dactyloides	Buffalograss	6	32.66	56,000
Gaillardia aristata	Blanketflower	0.2	1.1	132,000
Liatris punctata	Gayfeather	0.1	0.55	118,000
Petalostemum purpurreum	Purple Prairie Clover	0.1	0.56	260,000
Ratibida columnaris	Prairie Coneflower	0.06	0.33	260,000
Schizachyrium scoparium	Little Bluestem	1.4	1.4	260,000
Sporobolus cryptandrus	Sand Dropseed	0.1	0.1	5,298,000
Stipa viridula	Green Needlegrass	0.5	0.5	181,000
	Total	18.26	100 percent	7,688,000

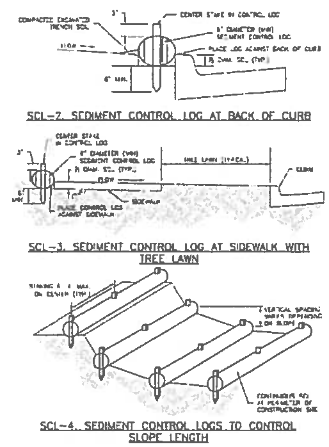
The short grass prairie mix is used along the outside of the setback areas and perimeter to and around buildings. It should be maintained to a height of approximately 18 to 24 inches and should be mowed infrequently.

(1/4) PERMANENT SEEDING NOTES
SCALE: N.T.S



(2/4) FINAL COVER DETAIL
SCALE: N.T.S





SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.

2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.

4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS OR HIGH VELOCITY DRAINAGE WAYS.

5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING.

6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER.

7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION. SEDIMENT CONTROL LOGS TO REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(3/4) SEDIMENT CONTROL LOG DETAILS
SCALE: N.T.S

CITY FILE NO. CPC UV 14-00128

Rev #	Date	Description	By	Chk'd

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T-BONE CONSTRUCTION — COLORADO SPRINGS, CO

SPECIFICATIONS & DETAILS
DEVELOPMENT PLAN FOR USE VARIANCE
3320 & 3330 DRENNAN INDUSTRIAL LOOP N.
COLORADO SPRINGS, COLORADO

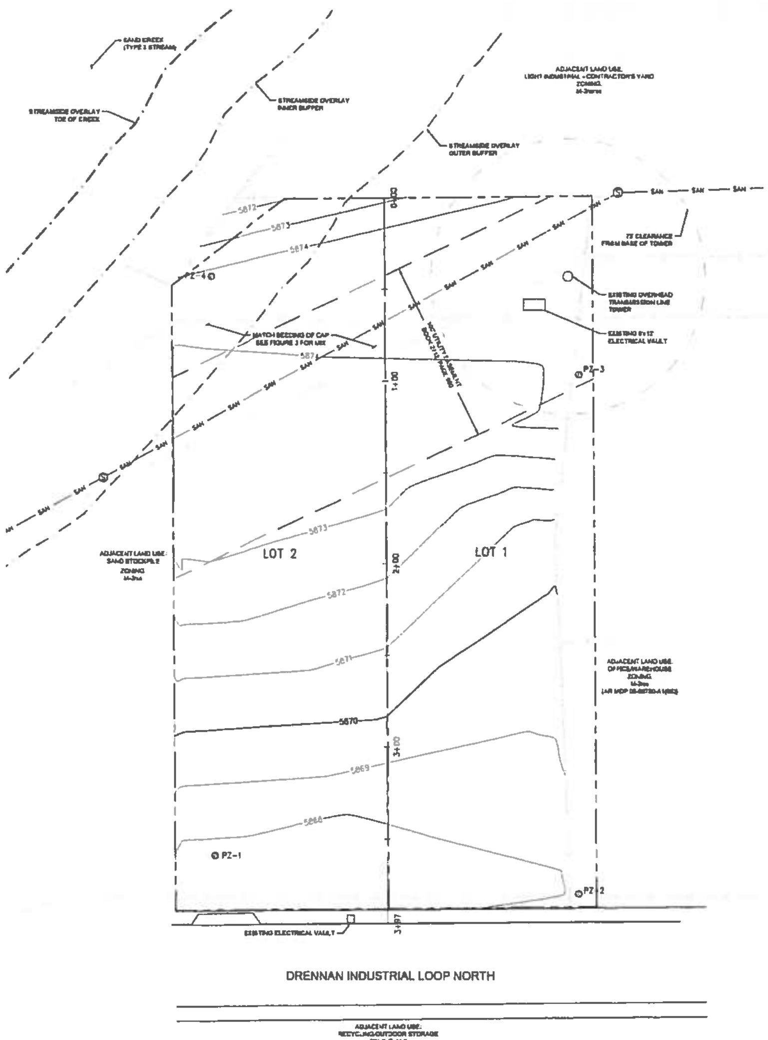
NOT FOR CONSTRUCTION 1/2017
THIS DRAWING IS INCOMPLETE AND NOT TO BE USED FOR CONSTRUCTION UNLESS IT IS STAMPED, SIGNED AND DATED

Designed	Drawn	Checked
DC	DC	MJP

Date: 23 Jan 17
Scale: Horiz. n.t.s. Vert. n.t.s.
Project No. 1D25152
Sheet 4 of 5

\\Dco10\land-est\SDSK\PROJ\DRENNAN SHINGLE FILE\DWG\pre-det.dwg, 1/23/2017 4:28:05 PM GGC

FIGURE 4 - Olesky Shingle



1/4 PROPOSED SITE CHARACTERISTICS WITH STREAM SIDE OVERLAY
SCALE: 1" = 30'

STREAMSIDE OVERLAY DATA

1. NAME: SAND CREEK
2. TYPE: 3
3. INNER BUFFER: 40'
4. AREA WITHIN PROPERTY: 0 sq.ft.
5. OUTER BUFFER: 80'
6. AREA WITHIN PROPERTY: 4,646 sq.ft.
7. TOTAL OVERLAY WITHIN PROPERTY: 4,646 sq.ft.
8. IMPERVIOUS SURFACE WITHIN OVERLAY: 0 sq.ft.

REVIEW CRITERIA

1. GRADING AND LANDFORM.
   - INTENT IS TO RETURN SITE TO PRE-STOCKPILE CONDITIONS.
2. SITE DESIGN.
   - THIS PLAN WILL RETURN THE AREA WITHIN THE OUTER BUFFER TO A NATURAL STATE AND REMOVE ALL ASPHALT SHINGLES FROM THE BUFFER.
3. WILDLIFE HABITAT PRESERVATION:
   - THIS PLAN WILL RETURN THE AREA WITHIN THE OUTER BUFFER TO A NATURAL STATE AND REMOVE ALL ASPHALT SHINGLES FROM THE BUFFER.
4. TRAILS AND RECREATION.
   - NOT APPLICABLE TO THIS SITE
5. FLOODPLAIN:
   - PROPERTY DOES NOT FALL WITHIN THE 100-yr FLOODPLAIN.
6. SIGNIFICANT NATURAL FEATURES
   - NO KNOWN SIGNIFICANT FEATURES EXIST WITHIN THE SITE.
7. COMPLEMENTARY PLANS
   - SITE IMPROVEMENTS MATCH ADJACENT PROPERTIES IN USE AND GROUND COVER.
8. RIPARIAN BUFFERS AND IMPERVIOUS SURFACES
   - A RIPARIAN BUFFER AREA WILL BE DEVELOPED AND PUT IN PLACE UPON COMPLETION OF GRADING ACTIVITIES.
   - NO IMPERVIOUS SURFACES EXIST WITHIN THE OVERLAY AREA.
   - DUE TO UNDERGROUND AND OVERHEAD UTILITIES IN THE AREA, NO VISUAL BUFFER IS ANTICIPATED.
9. LANDSCAPE.
   - ALL DISTURBED AREAS WITHIN THE OUTER BUFFER WILL BE REVEGITATED IN ACCORDANCE WITH THE CITY OF COLORADO SPRINGS' LANDSCAPE CODE.
10. STREAM BANK STABILIZATION:
   - NOT APPLICABLE, STREAM BANK IS OUTSIDE OF THE SUBJECT PROPERTY AND NOT IMPACTED BY THE PROPOSED WORK.
11. STREAM RECLAMATION
   - NOT APPLICABLE. STREAM BANK IS OUTSIDE OF THE SUBJECT PROPERTY AND NOT IMPACTED BY THE PROPOSED WORK.

LEGEND

- PROPOSED 5' CONTOUR
- PROPOSED 1' CONTOUR
- EXISTING UNDERGROUND ELECTRICAL
- EXISTING OVERHEAD ELECTRICAL
- EXISTING SANITARY SEWER
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FENCE LINE
- EXISTING CURB AND GUTTER
- PROPERTY / LOT LINE
- EXISTING UTILITY EASEMENT
- STREAMSIDE OVERLAY TOE OF CREEK
- STREAMSIDE OVERLAY INNER BUFFER
- STREAMSIDE OVERLAY OUTER BUFFER
- PZ-1 PIEZOMETER

30 0 30 60
SCALE IN FEET
1"=30'

CITY FILE NO.: CPC UV 14-00126

T-BONE CONSTRUCTION	COLORADO SPRINGS, CO
STREAMSIDE OVERLAY DEVELOPMENT PLAN FOR USE VARIANCE 3320 & 3330 DRENNAN INDUSTRIAL LOOP N. COLORADO SPRINGS, COLORADO	

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Designed	Drawn	Checked
DC	DC	MJP

Date: 23 Jan 17
Scale: Horiz: 1" = 30' Vert:
Project No: 1D25152
Sheet 5 of 5

1/23/2017 4:28:18 PM DCONNER

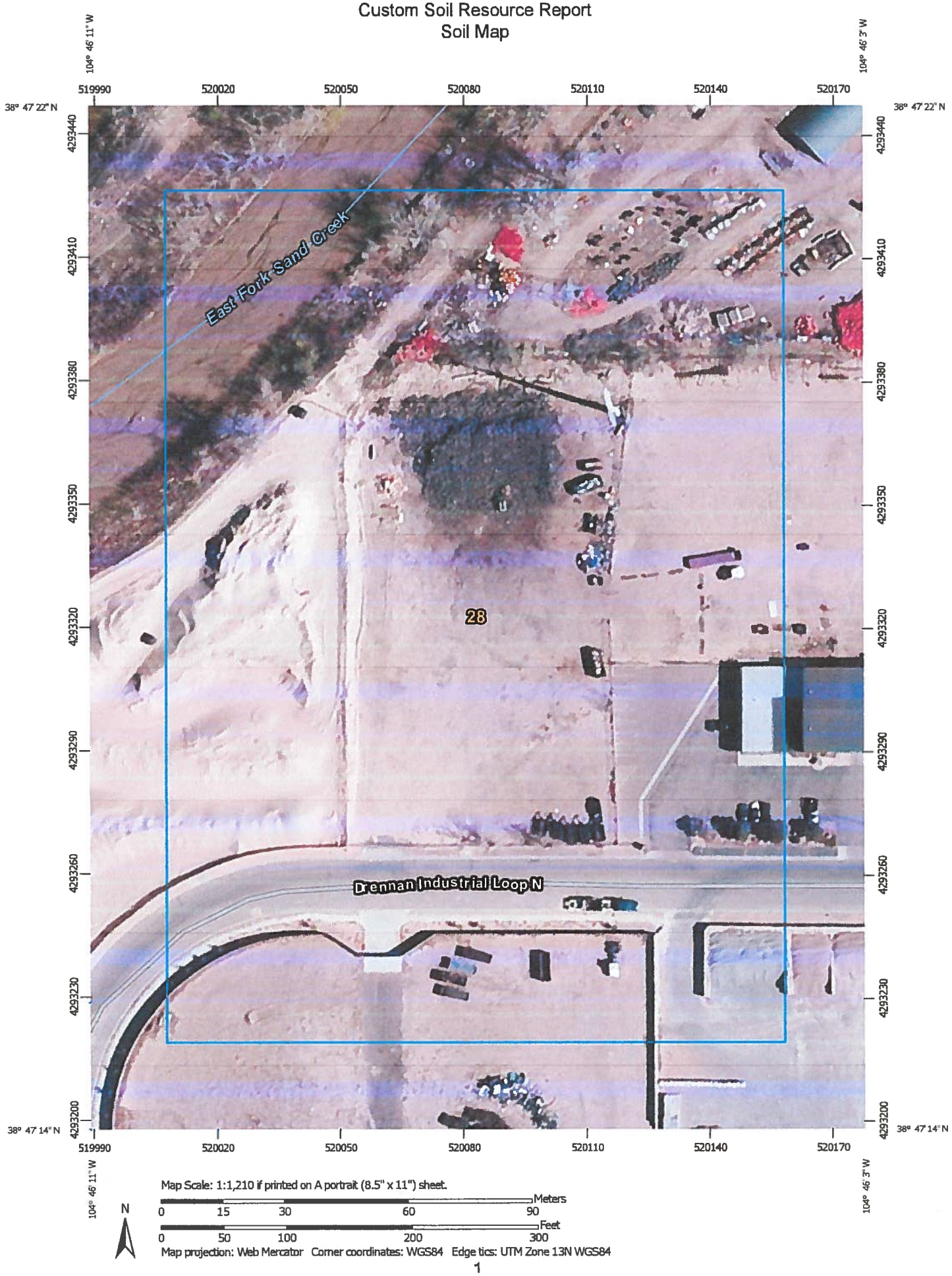
FIGURE 4 - Olesky Shingle

Appendix B

NRCS Soils Information and Map

FIGURE 4 - Olesky Shingle

Custom Soil Resource Report
Soil Map



1

FIGURE 4 - Olesky Shingle

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 10, Dec 23, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2011—Sep 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

FIGURE 4 - Olesky Shingle

El Paso County Area, Colorado

28—Ellicott loamy coarse sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 3680
Elevation: 5,500 to 6,500 feet
Mean annual precipitation: 13 to 15 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Ellicott and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ellicott

Setting

Landform: Flood plains, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

A - 0 to 4 inches: loamy coarse sand
C - 4 to 60 inches: stratified coarse sand to sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: Sandy bottomland (R069XY031CO)
Other vegetative classification: SANDY BOTTOMLAND (069AY031CO)

Minor Components

Fluvaquentic haplaquoll

Percent of map unit:
Landform: Swales

Pleasant

Percent of map unit:

FIGURE 4 - Olesky Shingle

Landform: Depressions

Other soils

Percent of map unit:

FIGURE 4 - Olesky Shingle

Appendix C

Waiver Request

FIGURE 4 - Olesky Shingle

Souder, Miller & Associates • 8000 W. 14th Avenue • Lakewood, CO 80214
(303) 239-9011 • fax (303) 239-0745

January 27, 2017

Solid Waste Permitting Unit
Solid Waste and Materials Management Program
Hazardous Materials and Waste Management Division
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Attention: Curt Stovall, P.E.

Subject: Lots 1 and 2, Drennan Industrial Center, Filing No. 12
Colorado Springs, Colorado
Waiver Request for Monitoring and Maintenance Requirements

Mr. Stovall:

On behalf of Mr. Neil Olesky, Olesky Investments, LLC of Greenwood Village, Colorado, Souder Miller & Associates (SMA) is submitting this request for waiver of groundwater monitoring, maintenance and operation of a leachate collection system, and maintenance and operation of a gas monitoring system for the above referenced project. Additionally, a waiver request for forty (40) verifiable hours of direct experience implementing Section 5.5 of the Regulations is contained herein. This waiver request has been prepared in accordance with the provisions of the Colorado "Regulations Pertaining to Solid Waste Sites and Facilities," 6 CCR 1007-2 (Regulations).

Facility Information

The Drennan project is located in El Paso County in the South half of Section 34, Township 14 South, Range 66 West. Lots 1 and 2 of the Drennan Industrial Center, Filing No. 12, are located on Drennan Industrial Loop N in the Drennan Industrial Park, as recorded in Plat Book D-4. Lot 1 contains approximately 1.01 acres (44,000 square feet) and Lot 2 contains approximately 1.00 acres (43,700 square feet). The site is at an elevation of 5,872 feet above mean sea level. Soils within the area have been mapped by USDA's Natural Resources Conservation Service (NRCS) and are classified within hydrologic group "A."

Project Background

The property is owned by Mr. Neil Olesky, owner of Olesky Investments, LLC, 9345 Riviera Hills Drive, Greenwood Village, CO 80111. In the early 1980s, the site was used for an asphalt plant. Mr. Olesky purchased the property in the late 1990s with the intent of using the entire property for his new business venture, Western Steel, a seller of new and used steel. However, only a portion of the property was needed for Western Steel and the remainder was leased to Western Scrap Processing from 2010 to 2011. Go Green Recycling, an asphalt shingle recycler from Kansas City, Missouri, leased the property for asphalt shingle storage in 2011, with the intent of removing the shingles for eventual recycling. However, legal issues between Olesky Investments and Go Green Recycling resulted in Go Green subsequently illegally abandoning the site and leaving Olesky Investments with a 32,000-ton stockpile of shingles on this approximately 2 acre parcel.

FIGURE 4 - Olesky Shingle

Rationale for Waiver Request

As discussed above, approximately 32,000 tons of asphalt shingles currently occupy the site. Mr. Olesky has pursued proper disposal of the shingles in a licensed landfill, however that was found to be cost prohibitive; therefore, a Closure and Post-Closure Plan that meets the relevant requirements of Sections 2.5, 2.6, 3.5, and 3.6 of the Regulations was prepared by SMA.

Groundwater Monitoring Waiver

Numerous studies have documented the benefits of asphalt shingle recycling. Asphalt shingle scrap can be used in a variety of products, including asphalt pavement, aggregate base and subbase, cold patch for potholes, and various other paving applications. Asphalt shingles are generally inert and leaching potential is minimal. According the Asphalt Shingle Manufacturing Association, approximately 80 percent of buildings in the United States have asphalt shingled roofs. Runoff from roofs is not considered hazardous and is handled as stormwater. Based on this information, negative impacts to groundwater from the shingle pile at this site is negligible.

Additionally, the shingle pile will be graded to promote runoff and covered with 3 feet of soils, of which, 1.5 feet will be low hydraulic conductivity soils. The cover will significantly reduce water infiltration into the shingle pile, thus further reducing the already low potential of impact to groundwater.

Maintenance and Operation of a Leachate Collection System

As discussed above, leachate generation from the covered shingle pile will be negligible; therefore, no leachate collection system is designed for this project.

Maintenance and Operation of a Gas Monitoring System

Asphalt shingles do not biodegrade; thus, no methane will be generated. Therefore, no gas collection system is designed for this project.

Regulation Section 5.5.3(C) 5)

A Qualified Project Monitor (QAM) will be onsite to observe and document the segregation of suspect asbestos-containing materials and will meet the training requirements outlined in section, (C) 1) through 4). Some segregation work has been done at the site and it has been determined that the stockpile mainly consists of roofing materials and little unexpected asbestos-containing material is expected to be encountered. Therefore, a waiver to Section 5.5.3(C) 5) requiring forty (40) verifiable hours of direct experience implementing Section 5.5 of the Regulations is requested.

Conclusion

SMA, on behalf of Mr. Olesky, requests waivers to groundwater monitoring, and maintenance and operation of leachate collection and gas monitoring systems, and the aforementioned training requirement for the shingle pile project located at Lots 1 and 2 of the Drennan Industrial Center in Colorado Springs, Colorado. It is SMA's opinion that approval of the waiver requests is justified, given the various factors regarding potential leachate and methane generation of the shingles, the low hydraulic conductivity cover incorporated into the final closure design, and the low expectation that asbestos-containing material will be encountered.

FIGURE 4 - Olesky Shingle

Please review the information presented herein and contact Michael Pretti at (920) 239-9011 if additional information will expedite your review or if you have any questions or comments.

Respectfully submitted,

SOUDER MILLER & ASSOCIATES

Michael J. Pretti, P.E.
Senior Engineer

FIGURE 4 - Olesky Shingle

Appendix D

Construction Quality Assurance/Quality Control (CQAQC) Plan

FIGURE 4 - Olesky Shingle

CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL PLAN

LOTS 1 AND 2, DRENNAN INDUSTRIAL CENTER
COLORADO SPRINGS, COLORADO

Prepared for:

Neil Olesky
Western Steel, Inc.
Colorado Springs, Colorado

Prepared by:

Souder, Miller & Associates
Lakewood, Colorado

Michael J. Pretti, P.E.
Senior Engineer

COLORADO LICENSED
MICHAEL J. PRETTI
1-27-17
0046503
PROFESSIONAL ENGINEER

Graham Cottle, E.I.
Staff Civil Designer

Project No. 1D25152
Date: January 2017

SMA
Souder, Miller & Associates
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(303) 239-9011 • fax (303) 239-0745 • www.soudermiller.com

FIGURE 4 - Olesky Shingle

TABLE OF CONTENTS

FIGURE 4 - Olesky Shingle

List of Tables

List of Drawings

FIGURE 4 - Olesky Shingle

1.0 INTRODUCTION

This Construction Quality Assurance/Quality Control Plan (CQAQCP) has been prepared for site closure for the shingle pile located on Lots 1 and 2 of the Drennan Industrial Park, Colorado Springs, Colorado. This CQAQCP addresses the quality assurance of the construction and installation of environmental control systems at the site, including earthen materials (foundation layer, barrier layer, and vegetative layer soils), and materials for surface water control structures. This CQAQCP is intended to be a "working" document that is updated to reflect changes in specific materials used, in installation practices, or in tests and test methods.

The CQAQCP includes the information and procedures for final cover construction. The scope of this CQAQCP includes the quality assurance applicable to these construction components for the following:

- Cover soil placement, compaction, and testing

1.1 Quality Assurance and Quality Control

Construction quality assurance and quality control are defined as follows:

Construction Quality Assurance (CQA) is a planned system of activities that provides the Owner and permitting agency assurance that the facility was constructed as specified in the design. Construction quality assurance includes inspections, verifications, audits, and evaluations of materials and workmanship necessary to determine and document the quality of the constructed facility. Construction quality assurance refers to measures taken by the CQA organization to assess if the Installer or Contractor is in compliance with the plans and specifications for a project.

Construction Quality Control (CQC) is a planned system of inspections that is used to directly monitor and control the quality of a construction project. Construction quality control is normally performed by the earthwork contractor and is necessary to achieve quality in the constructed or installed system. Construction quality control refers to measures taken by the Contractor to determine compliance with the requirements for materials and workmanship as stated in the plans and specifications for the project.

1.2 General Testing Requirements

This CQAQCP includes references to test procedures of the American Society for Testing and Materials (ASTM).

Unless indicated otherwise, tests will be performed in strict accordance with the referenced test procedure and the description included in this plan. Any deviations to test procedures specified in this plan must be approved, in writing, by the Construction Quality Assurance Engineer (CQAE) and the Colorado Department of Public Health and Environment (CDPHE).

1.3 Organization and Use of the CQAQC Plan

The CQAQCP is divided into 4 main sections as follows:

Section 1.0: Introduction
Section 2.0: Surveying Requirements

FIGURE 4 - Olesky Shingle

Section 3.0: Earthen Materials
Section 4.0: Construction Certification Report

This organization is based on general construction procedures and materials and does not follow the actual sequence of systems as they are constructed at the site.

1.4 Definitions

1.4.1 Construction Quality Assurance Engineer

Mr. Neil Olesky, owner of Olesky Investments, LLC, (henceforth, Owner) will retain an independent consulting firm to fulfill the role of CQAE. The CQAE consulting firm shall provide a Colorado registered professional engineer for oversight and supervision of CQAE activities. The CQAE will observe and document activities related to construction of environmental containment systems at the site and will provide overall coordination of documentation submitted in support of this plan. The CQAE will also be responsible for surveying (horizontal and vertical control). A Colorado registered professional engineer employed by the CQAE will prepare and certify the Construction Certification Report, which will be submitted to CDPHE upon approval by the Owner. The term "CQAE" is used throughout this document when reference is made to the tasks performed by this role.

1.4.2 Design Engineer

The Design Engineer is the company hired by the Owner to prepare the Closure Plan. Souder, Miller & Associates (SMA) is the Design Engineer for this project. This Plan is prepared under the supervision of, and is sealed by, a Colorado registered professional engineer. The term "Design Engineer" is used throughout this document to indicate the official representative of the Design Engineer, whether on site or not.

1.4.3 Facility Owner

Mr. Olesky is the Owner of the site. The term "Owner" is used throughout this document to indicate the official representative of the Owner.

1.4.4 General Contractor

The General Contractor will have overall responsibility for the completion of construction. The General Contractor will also be responsible for hiring of all subcontractors such as the Earthwork Contractor. The term "Contractor" is used throughout this document when reference is made to the tasks and responsibilities for this role.

1.4.5 Soils Testing Laboratory

The Soils Testing Laboratory is an independent, qualified laboratory hired by the CQAE to perform field and/or laboratory Quality Assurance/Quality Control (QAQC) soils tests as indicated in the CQAQCP. The term "Soils Testing Laboratory" is used throughout this manual to denote the official representative of the company providing these services. The Soils Testing Laboratory will supply technicians as necessary for collection and laboratory analyses of samples and testing of in-place earthen materials. The QAQC testing performed by the Soils Testing Laboratory shall be performed under the supervision of a Colorado registered professional engineer.

FIGURE 4 - Olesky Shingle

1.5 Organization CQAQCP Parties

Overall responsibility for carrying out the provisions of this CQAQCP is with the CQAE. The CQAE must consult the Design Engineer regarding design specifications and/or recommended changes in the Design Plans and Drawings.

The Contractor (including any subcontractors that may be brought to the site) will report to the Owner and the CQAE for matters relating to the CQAQCP. The Owner and CQAE shall consult the Design Engineer with questions about, or possible modifications to, the Design Plans and Drawings.

1.6 Meetings

There are two types of meetings which will be required for implementation of this Plan: pre-construction meetings and problem/deficiency meetings.

A pre-construction meeting will be conducted immediately prior to the commencement of construction and will be attended by the Owner and the Contractor, along with other appropriate parties such as the Soils Testing Laboratory and the CQAE. The purpose of this meeting will be to review the project and the CQAQCP as it applies to environmental control system construction and familiarize all parties with their respective responsibilities and interactions.

Problem/deficiency meetings will be conducted as requested by the Owner or CQAE to work out problems which may arise with the construction or CQAQC testing. The meetings will be attended by appropriate parties.

1.7 Deficiencies and Resolution

If a deficiency is discovered in the construction work, the CQAE will determine the extent and nature of the defect by additional testing, observation, review of data, or other appropriate means and will then inform the Owner. The Owner and the CQAE will direct the Contractor to perform the necessary corrective tasks. The previously defective area will be retested as appropriate to document the success of corrective action.

1.8 Documentation

This section describes the types of documentation reports that must be completed by each party which has direct QAQC responsibility for the construction. The parties with these responsibilities are the CQAE and the Soils Testing Laboratory.

The documentation of CQA activities is the most effective method to make certain that the quality assurance requirements have been addressed and satisfied. The documentation process includes:

- Recognition of construction tasks that should be documented
- Assignment of responsibilities for the observation, testing, and documentation of these tasks
- Completion of the required forms, data sheets, and reports to provide an accurate record of the work performed during construction

1.8.1 Daily Construction Reports

A construction report will be completed by the CQAE or the Soils Testing Laboratory each day that they perform work on the site. This summary report will provide a chronological

FIGURE 4 - Olesky Shingle

record for identifying and recording other reports, data sheets, forms, and checklists. This report will contain, at a minimum, the following information to be written in ink and preferably pre-printed so that the required information is organized in an easily accessible manner:

- Date, project name, location, and report preparer's name
- The number and name of people on site under the direction of the preparer related to QAQC tasks
- Data on pertinent weather conditions including temperature, humidity, wind direction and speed, cloud cover, and any precipitation events
- Contractor's work force, equipment in use and idle, and materials delivered to or removed from the job site
- Chronological description of work in progress including any notices to, or requests from, the Contractor
- Results of, or a clear reference to where the results can be found for testing performed on site by personnel under the direction of the preparer
- Laboratory samples collected, marked, and sent to the outside testing laboratories will be clearly indicated in the daily report by direct inclusion or by reference to the document containing such information. Likewise, reference should be included for any test data submitted by any of the outside testing laboratories
- An accurate record of communications with other QAQC parties, or any other outside companies, regulatory agencies, or consultants will be kept regarding the day's construction activities or any project meetings that are held
- An accurate record of calibrations or standardizations performed on field testing equipment, including actions taken as a result of recalibrations, will also be kept.
- Discussion of failing field tests, corrective action (s) taken, and retesting confirmation if a problem/deficiency identification and corrective action report is not completed.
- A description of non-confirming work and corresponding problem/deficiency identification.
- Signature of CQAE.

1.8.2 Problem/Deficiency Identification and Corrective Action Reports

Problem and/or deficiency and corrective action reports will be completed by the Soils Testing Laboratory and/or the CQAE when any construction material or activity observed or tested does not meet the requirements set forth in this plan. These reports are not necessary for a failing field test if corrective action is taken and retesting confirms acceptable properties. These reports shall be cross-referenced to the forms, data sheets, checklists, and other reports that contain data or observations leading to the determination of a problem or deficiency. At a minimum, the Problem/Deficiency Identification and Corrective Action Reports will include the following information:

- A detailed description of the problem or deficiency, including reference to any supplemental data or observations responsible for determining the problem or deficiency
- Location of the problem or deficiency, including how and when the problem or deficiency was discovered. In addition, an estimate of how long the problem or deficiency has existed should be included as well as an opinion as to the probable cause of the problem or deficiency

FIGURE 4 - Olesky Shingle

- A recommended corrective action for resolving the problem or deficiency should also be included in the report. If the corrective action has already been implemented, then the observations and documentation to show that the problem or deficiency has been resolved should be included. If the problem or deficiency has not been resolved by the end of the day upon which it was discovered, then the report will clearly state that it is an unresolved problem or deficiency.

A problem/deficiency report will be submitted to the CQAE by the end of the working day during which the problem or deficiency occurred. If a solution to the problem or deficiency has not been agreed to by the end of the day, the CQAE will discuss the issue with the Owner, and the Owner will take the necessary corrective actions to resolve the problem or deficiency as soon as practical. The CQAE is responsible to make certain that all Problem/Deficiency Identification Reports have been adequately resolved.

The CQAE will carefully review all problem/deficiency reports to determine whether similar reports on the same problem or deficiency are an indication of a need to make changes to the Design Plans and Drawings and/or the CQAQCP. If this situation should develop, a meeting will be held to determine whether revisions to the plans or Design Plans and Drawings or this CQAQCP should be made. Any revisions to the Design Plans and Drawings or the CQAQCP must be approved by the Owner, CQAE, and CDPHE, as appropriate. Note, that a section on "problem/deficiencies" completed on the CQAE daily report may suffice as a Problem/Deficiency Report.

1.8.3 Construction Certification Report

A Construction Certification Report will be prepared by the CQAE following completion of construction. At a minimum, the Construction Certification Report will contain the following information:

- All correspondence with CDPHE regarding this particular project
- Documentation of all required surveys (see list in Section 2.1 of this CQAQC Plan)
- A summary of all problem/deficiency reports and resolutions
- Discussion of any changes to the approved plans, drawings, or specifications made during construction
- Discussion and CQA Engineer evaluation of any items not in conformance to the approved design, particularly those discovered after construction has been completed
- All daily reports, field and laboratory results of Soils Testing Laboratory for cover soils and coarse-grained soils for rip-rap
- Correspondence with Soils Testing Laboratory regarding placement and testing of soils
- As-built construction drawings
- Representative photographs of the construction taken during various phases of construction
- A statement by the CQAE documenting that the construction has been completed in substantial accordance with the approved Plans, specifications, and CQAQCP

The as-built construction drawings shall include, but shall not be limited to:

- Pre-construction site conditions
- Subgrade contour map illustrating final grading of the shingle pile
- Top of foundation layer contour map illustrating constructed grades and elevations

FIGURE 4 - Olesky Shingle

- Top of barrier layer contour map illustrating constructed grades and elevations
- Maps as necessary illustrating constructed locations of permanent surface water features, fences, and gates.

FIGURE 4 - Olesky Shingle

2.0 SURVEYING REQUIREMENTS

2.1 Required As-Built Surveys

Surveys performed for inclusion in the construction documentation report shall include, but not necessarily be limited to:

- As-built subgrade (top of shingle pile) contours and grades
- As-built top of foundation layer contours and grades
- As-built top of barrier layer contours and grades
- As-built locations, contours, and grades of final surface
- Shingle disposal boundary
- Permanent surface water control structures, if any
- Site boundary location relative to construction.

2.2 Initial Surveying

Grade staking will be performed by surveyors, under the supervision of the CQAE, to establish required elevations for the top of shingle pile design grade. The CQAE will document elevations by survey using established vertical control. Vertical elevations of top of shingle pile grades will be documented based on a grid spacing of 50 feet or less, and the axes of the tops and toes of slopes will be surveyed on a spacing of 50 feet or less. The grid established will be used for the various overlying soil layers so that survey points are "stacked" so accurate thicknesses of each soil layer can be determined.

Vertical measurements shall be read to the nearest 0.01 foot to establish elevations at a minimum precision of 0.1 foot. Horizontal measurements shall be read to the nearest 0.1 foot to establish locations at a minimum precision of 0.5 foot.

2.3 Top of Foundation Layer Surveying

The CQAE will document top of foundation layer elevations by survey using established vertical control. Vertical elevations of foundation layer finish grades will be documented based on a grid spacing of 50 feet or less, and the axes of the tops and toes of slopes will be surveyed on a spacing of 50 feet or less. Vertical survey measurements shall be read to the nearest 0.01 foot to verify that foundation layer is a minimum of 0.5-foot thick and within a tolerance of ± 0.1 foot. Horizontal measurements shall be read to the nearest 0.1 foot to establish locations at a minimum precision of 0.5 foot.

2.4 Final Cover Surveying

The CQAE will document final cover elevations. The surveyor, under the supervision of the CQAE, will establish vertical elevations of the final cover (top of barrier layer and top of topsoil layer) to a tolerance of 0.0-foot to +0.1-foot as measured by appropriate surveying methods. Vertical elevations of each layer will be documented based on a grid spacing of 50 feet or less, and the axes of the tops and toes of slopes will be surveyed on a spacing of 50 feet or less. It should be noted that the finish grades shown on the final grading plan represent the target for final construction; however, settlement of the shingle mass may occur before, during, and after placement of final cover. Therefore, the final contours may be slightly lower or higher than the design contours as long as the minimum and maximum design slopes are met and the thickness of each layer of the final cover configuration is no less than listed below. However, at no point will final shingle grades

FIGURE 4 - Olesky Shingle

exceed an elevation that would prevent the final cover from being constructed within the approved final elevation.

The CQAE will verify the proper thickness of the barrier layer of the final cover. At the discretion of the CQAE, the barrier layer may be bored to determine thickness, prior to installation of the topsoil layer. If boring techniques are used, a minimum of one hole shall be bored every 50 feet on a grid to establish minimum layer thickness. All borings shall be backfilled throughout the entire depth with granular bentonite. However, boring will not be a substitute for appropriate surveys of the top of the foundation layer or the top of the barrier layer.

If the barrier layer thickness is verified by surveying, the survey shall be completed on a grid spacing of 50 feet or less. The top of the cover (top of the topsoil layer) shall be verified by surveying on a grid spacing of 50 feet or less. At the discretion of the Owner and/or Contractor and to minimize overfilling as a result of potential settlement concurrent with cover construction, settlement plates may be used to assist in documentation of the thickness of the cover layers. The frequency of installation of these plates is discretionary with the Contractor or Owner. Thickness of the cover components shall be measured normal to the final slope configuration. The required minimum total thickness of these layers is 3.0 feet. Design thicknesses for the individual layers are:

- Topsoil layer 0.5 ft. (min)
- Low hydraulic conductivity (barrier) layer ($\leq 1 \times 10^{-5}$ cm/sec) 1.5 ft. (min)
- Foundation layer 1.0 ft.

FIGURE 4 - Olesky Shingle

3.0 EARTHEN MATERIALS

This part of the CQAQCP describes the earthen materials used in constructing the final cover and drainage structures for the site.

Initial work will include regrading of the shingle pile to lessen the areal extent of the pile. Slopes will be graded to no greater than 4:1 and no less than 5 percent. Final cover will then be placed.

3.1 Non-Granular Soils

This section includes the QAQC requirements for placement and compaction of non-granular soils used for constructing the final cover. For purposes of this CQAQCP, non-granular soils are select clayey sands and clay soils (SC and CL in accordance with the Unified Soil Classification System or USCS). The non-granular soils will be used for the following:

- Backfilling areas that are over excavated, if necessary
- Constructing the shingle pile cover foundation layer
- Constructing the barrier layer
- Constructing other structural fills at the site, as necessary

Any field tests, soil sample locations, and survey measurements will be recorded in reports by the CQAE or its representative including locations (by site grid station) and elevations of all field tests and laboratory sample points.

In addition to the onsite non-granular soil materials, bentonite will be imported to the site for repair of test probe holes in the barrier layer that occur during moisture/density testing. Perforations due to nuclear density testing shall be backfilled by using granular bentonite compacted by hand to achieve continuity of the compacted barrier layer at these locations.

3.1.1 Pre-construction

Non-granular soil placement will be performed in accordance with the Design Plans and Drawings. The Soils Testing Laboratory and/or CQAE shall document that placement and/or recompacting operations are conducted in compliance with the project Design Plans and Drawings and with this CQAQCP.

3.1.2 Materials of Construction

Clayey soils used for construction of the final cover will be imported from off-site sources. All soils used in barrier layer construction shall be compacted according to the Design and Construction Plans.

3.1.3 Field Testing Requirements

The nuclear moisture/density field testing methods used during construction shall be performed in accordance with ASTM D6938.

Test frequencies for performing field moisture/density tests on clayey material for the barrier layer soils are presented in Table 1.

Field in-place moisture/density tests shall be verified by laboratory testing and/or alternate field methods on a periodic basis. At least one verification test shall be performed per 30 otherwise required field tests. Verification tests will include separate nuclear density device tests. The verification test will be within two feet of a required test and shall be

FIGURE 4 - Olesky Shingle

considered acceptable if the dry density values of the two tests are within 5% of each other. In addition, nuclear moisture/density devices shall be calibrated daily and the results of the calibration tests included in the daily field report.

Table 1

Non-Granular Soil Compaction/Moisture Specifications and Minimum Field Test Frequencies

Fill Type	Minimum Test Frequency	Compaction/Moisture Specification
Foundation Layer	NA	NA
Barrier Layer	4/acre/lift or at least 1 test per discrete area of backfill	92% ASTM D1557 @ 0 to 4 percent of optimum moisture content

3.1.4 Laboratory Testing Requirements

The qualified Soils Testing Laboratory will conduct periodic laboratory testing on samples from the soil borrow area and from the fill areas. Table 2 presents the minimum laboratory test types, methods, and frequencies for all non-granular soils used as structural fill at the site.

FIGURE 4 - Olesky Shingle

Table 2

Laboratory Testing Specifications for Non-Granular Soils

Preconstruction Testing		
Test	***Method***	***Minimum Frequency***
Water Content	ASTM D2216	1 per 2,620 yds^3
Modified Proctor	ASTM D1557	1 per 6,540 yds^3
Atterberg Limits	ASTM D4318	1 per 6,540 yds^3
Grain Size Analyses	ASTM D422/D1140	1 per 6,540 yds^3
Unified Soil Classification	ASTM D2487	1 per 6,540 yds^3
Hydraulic Conductivity (Shelby tube samples)	ASTM D5084	1 per 13,080 yds^3
Construction Testing		
Test	***Method***	***Minimum Frequency***
Modified Proctor	ASTM D1557	1 per 6,540 yds^3 or change in material type
Atterberg Limits	ASTM D4318	1 per Proctor or change in material type
Grain Size Analyses	ASTM D422	
Unified Soil Classification	ASTM D2487	
Hydraulic Conductivity (Shelby tube samples)	ASTM D5084	1/hectare/12-inch lift of barrier layer

3.1.5 Acceptance Criteria

The following acceptance criteria will apply to non-granular soil for the barrier layer:

- The soils will be compacted to the density specified on the Design and Construction Plans. Moisture content specifications will be met for all soils. Moisture will be maintained at 0 to +4 percentage points of optimum moisture content. When moisture content is outside of these limits, measures will be taken to bring the moisture content within the specification. However, moisture content will not be used as the sole criterion for failing a density test.

FIGURE 4 - Olesky Shingle

- Any soils that do not classify as SC or CL by the Unified Soil Classification System shall be reported immediately to the CQAE, segregated from acceptable materials, and not used in the barrier layer construction.
- A laboratory determination of hydraulic conductivity greater than $1x10^{-5}$ cm/sec for final cover barrier layer will be reported immediately to the CQAE.
- If a hydraulic conductivity test fails the specification, at least one additional sample will be collected from the general area (within 25 feet) of the failing test. Based on the initial test and the retest results, the CQAE will determine whether additional tests should be conducted and/or repairs to the final cover barrier layer made to correct the deficiency.

3.1.6 Placement Criteria

The non-granular structural fill soils shall be placed with emphasis on the following:

- Segregation and removal of unsuitable material
- Removal of rock greater than 4 inches in diameter
- Removal of organic material and other deleterious materials
- Removal of structurally weak material, i.e., organic debris and soils that classify as silt (ML under the Unified Soil Classification System).

Field densities and moisture contents will be measured in areas where non-granular compacted soil has been placed in order to document that the in-place soils are in conformance with the required specifications.

Any backfilling and/or placement of non-granular soils will be accomplished in accordance with the following requirements:

- Observed stones greater than 4 inches in any dimension will be removed from this material by mechanically screening the soil or manual removal during soil homogenizing and moisture conditioning
- No frozen soils will be used for backfilling. Any frozen soils in the compaction work area will be removed
- The loose thickness of layers for soil compaction shall not exceed 8 inches
- Compaction will be performed on properly homogenized and moisture conditioned soil so as to accomplish continuous and complete layer bonding and continuity of all soil construction joints. The maximum clod size shall be 4 inches in any dimension
- Unacceptable compaction or moisture content will be reported immediately to the CQAE by the Soils Testing Laboratory. Corrective action will consist of moisture conditioning of the soil and/or additional compactive effort as necessary.

3.1.7 Final Cover

The final cover over the shingle pile will have a minimum thickness of 3.0 feet measured normal to the slope including a 0.5-foot vegetative layer overlying the 1.5-foot barrier and 1.0-foot foundation layers compacted per the Design and Construction Plans. The thickness of the cover components and the total cover thickness shall be verified as specified in Section 2.4.

The foundation layer consists of a 1.0-foot thick lift of soil, which will provide a structural basis for installation of the low hydraulic conductivity barrier layer. This layer shall be nominally compacted to provide a stable support for the barrier layer.

FIGURE 4 - Olesky Shingle

The low hydraulic conductivity barrier layer will consist of a 1.5-foot thick compacted clayey soil layer that will exhibit a nominal hydraulic conductivity of less than or equal to 1 x 10^{-5} cm/sec.

The topsoil layer will consist of the materials capable for support of vegetative growth.

3.1.8 Deficiencies and Resolution

If a deficiency is discovered in the construction work, the CQAE along with the Soils Testing Laboratory will determine the extent and nature of the defect by additional testing, observation, review of data, or other appropriate means and will then inform the Owner. The CQAE and Owner will obtain written approval from CDPHE to implement the resolution to any significant change. The Owner and the CQAE will direct the Contractor to perform the necessary corrective tasks. The Soils Testing Laboratory will retest the previously defective area as appropriate to document the success of corrective action.

FIGURE 4 - Olesky Shingle

4.0 CONSTRUCTION CERTIFICATION REPORT

As a part of the CQAQC activities, a construction certification report will be completed documenting the aforementioned activities. This report, to be submitted to CDPHE, will contain, at a minimum, the following information:

- Certification by a professional engineer, registered in the State of Colorado, that, based on his/her knowledge and review of the construction records, the construction has been performed in substantial conformance with the engineering plans and specifications
- Detailed narrative describing the construction events in chronological order and results of any quality assurance testing
- Daily field reports prepared by the onsite CQA field technician
- Field and laboratory test data relevant to earthwork
- Information and discussion relevant to operations layer placement
- Discussion of any construction material or equipment which deviated from the engineering plans and specifications, reasons for deviation, methods to bring the deviation into compliance, and CDPHE approval (when appropriate) of deviations
- Photographs documenting construction
- Record drawings, sealed by a licensed professional engineer, documenting the "as constructed" elevations of the various components of the construction, locations of field testing performed, and cross sections of the construction
- The record drawings will be certified by a professional licensed surveyor (PLS)

FIGURE 4 - Olesky Shingle

Appendix E

Site Inspection Form

FIGURE 4 - Olesky Shingle

Appendix F

Piezometer Data

FIGURE 4 - Olesky Shingle

3320 Drennan Industrial Loop, Colorado Springs, CO Piezometers								
	PZ-1		PZ-2		PZ-3		PZ-4	
GS Elev: Stickup	5867.0 0.87	GW Elevation:	5868.0 0.3	GW Elevation:	5870.0 0.55	GW Elevation:	5873.2	GW Elevation:
2/13/2016	23.16	5842.97	-	-	15.27	5854.18	-	-
3/29/2016	23.45	5842.68	24.10	5843.60	16.82	5852.63	-	-
4/2/2016	23.50	5842.63	24.25	5843.45	17.30	5852.15	-	-
4/10/2016	23.65	5842.48	24.30	5843.40	18.65	5850.80	-	-
4/18/2016	23.67	5842.46	24.43	5843.27	21.40	5848.05	-	-
4/24/2016	23.70	5842.43	24.42	5843.28	18.80	5850.65	-	-
4/1/2016	23.80	5842.33	24.56	5843.14	15.66	5853.79	-	-
4/9/2016	23.70	5842.43	24.60	5843.10	14.85	5854.60	-	-
5/15/2016	23.73	5842.40	24.71	5842.99	14.50	5854.95	-	-
5/21/2016	23.69	5842.44	24.72	5842.98	14.14	5855.31	-	-
5/30/2016	23.17	5842.96	24.84	5842.86	13.79	5855.66	-	-
6/12/2016	23.10	5843.03	24.50	5843.20	13.48	5855.97	-	-
6/18/2016	23.98	5842.15	23.74	5843.96	13.60	5855.85	-	-
7/23/2016	23.36	5842.77	24.21	5843.49	14.51	5854.94	17.00	5856.17
8/1/2016	23.21	5842.92	24.15	5843.55	14.54	5854.91	17.00	5856.17
8/15/2016	23.20	5842.93	24.09	5843.61	14.97	5854.48	17.00	5856.17
8/21/2016	23.18	5842.95	24.08	5843.62	15.09	5854.36	17.00	5856.17
8/28/2016	23.30	5842.83	24.15	5843.55	15.27	5854.18	17.00	5856.17
9/3/2016	23.19	5842.94	24.11	5843.59	15.05	5854.40	17.00	5856.17
9/10/2016	23.25	5842.88	24.18	5843.52	15.16	5854.29	17.00	5856.17
9/18/2016	23.3	5842.83	24.24	5843.46	15.24	5854.21	17.00	5856.17
9/24/2016	23.38	5842.75	24.32	5843.38	15.38	5854.07	17.00	5856.17
10/1/2016	23.47	5842.66	24.37	5843.33	15.52	5853.93	17.00	5856.17
10/8/2016	23.56	5842.57	24.46	5843.24	15.76	5853.69	17.00	5856.17
10/15/2016	23.59	5842.54	24.51	5843.19	15.97	5853.48	17.00	5856.17
10/23/2016	23.72	5842.41	24.63	5843.07	15.94	5853.51	17.00	5856.17
10/30/2016	23.7	5842.43	24.71	5842.99	15.78	5853.67	17.00	5856.17
11/5/2016	23.75	5842.38	24.76	5842.94	15.8	5853.65	17.00	5856.17
11/12/2016	23.82	5842.31	24.81	5842.89	15.99	5853.46	17.00	5856.17
11/21/2016	23.86	5842.27	24.86	5842.84	16.2	5853.25	17.00	5856.17
11/27/2016	23.92	5842.21	24.88	5842.82	16.38	5853.07	17.00	5856.17
12/4/2016	23.97	5842.16	24.89	5842.81	16.75	5852.70	17.00	5856.17
12/10/2016	24.02	5842.11	24.89	5842.81	17.3	5852.15	17.00	5856.17
12/16/2016	24.07	5842.06	24.9	5842.80	18.02	5851.43	17.00	5856.17
Average	23.56	5842.57	24.47	5843.23	15.85	5853.60	17.00	5856.17
Maximum:	24.07	5843.03	24.90	5843.96	21.40	5855.97	17.00	5856.17

FIGURE 4 - Olesky Shingle