

July 3, 2015

Joan Armstrong, Director  
Pueblo County Department of Planning and Development  
229 W. 12<sup>th</sup> Street  
Pueblo, CO 81003-2810

Dear Joan,

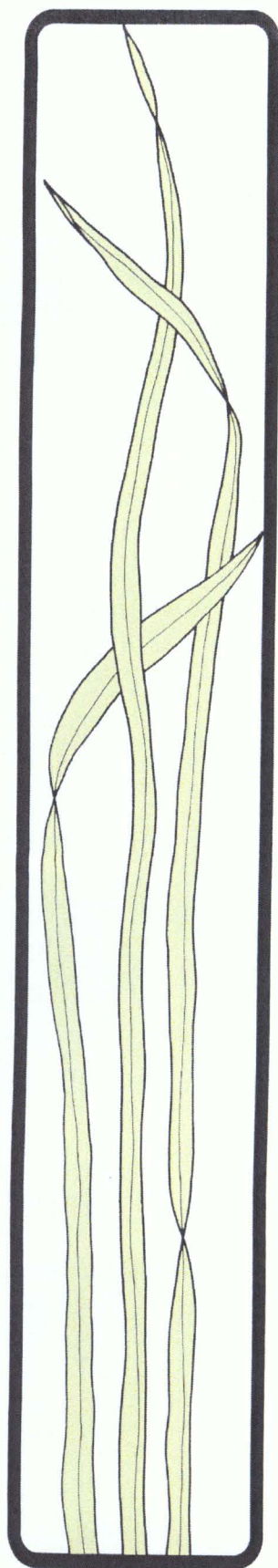
Enclosed is a copy of my draft revegetation evaluation report for the S3 Section of the SDS Pipeline. I have also included a CD that contains the source document.

After the document has been reviewed, let me know what changes may be necessary.

Best regards,

Warren R. Keammerer, Ph.D.  
Senior Plant Ecologist

Encls.



## **EVALUATION OF REVEGETATION SUCCESS ALONG THE S3 SECTION OF THE SDS PIPELINE IN PUEBLO COUNTY**

Prepared for:

Pueblo County Department of Planning and Development  
Pueblo County, Colorado

July, 2015

Prepared by:

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### INTRODUCTION

This evaluation of revegetation success along the S3 Section of the Southern Delivery System (SDS) water pipeline in Pueblo County was conducted independently of similar evaluations conducted by Colorado Springs Utilities (CSU). The primary purposes of this study were to obtain vegetation sampling data that could be used for comparison with results obtained by CSU consultants and to provide an independent evaluation of whether or not the revegetation performance standards outlined in the 1041 Permit were being met. The report summarizes the revegetation performance standards from the 1041 Permit, describes how the standards were developed, provides vegetation sampling results from 2014 and evaluates the degree to which the performance standards are being met.

### REVEGETATION PERFORMANCE STANDARDS IDENTIFIED IN THE 1041 PERMIT

The overall goal of revegetation in the 1041 Permit is stated as:

**“Applicant shall provide Pueblo County residents with replacement vegetation and property to match pre-construction conditions or better.”**

This overall goal is clarified by describing that “matching pre-construction condition or better” will be based on evaluating vegetation cover by acceptable species, evaluating species diversity and assessing the abundance of noxious weeds (as defined by lists prepared by the State of Colorado). The requirements associated with these vegetation attributes are described in the following section.

Vegetation Cover. The 1041 Permit states that successful vegetation establishment will consist of (in part) attaining cover values that are equal to (or greater than) 90 percent of the values that were present prior to construction of the water pipeline. Before construction of the pipeline, a vegetation study was conducted in October 2011 by CSU-SDS consultants to determine what the existing vegetation cover values were along the length of the water line right-of-way (ROW). The sampling program was stratified based on six different soil groups that had been identified along the water line route. Additionally, the ROW was divided into three segments: S1, S2 and S3. Not all of the six soil groups occurred in each of the segments. In October 2011, vegetation cover data were collected by CSU consultants at 52 locations along the entire length of the ROW. After reviewing the data from the vegetation sampling transects, some of the results were dropped from the set of transects used to develop the base vegetation cover values. The reason for excluding some of the transects was that the excluded sites had low vegetation cover values that were not consistent with values measured at other sites within a particular soil group. The low values were related to impacts from grazing by livestock and prairie dogs. After excluding the data from 11 transects, base vegetation values were developed for each of the soil groups using the data from 41 transects. The vegetation cover standards were developed by multiplying the base values by 0.9 (90 percent). The transect locations for the 2011 study were distributed among the three ROW Segments as shown in Table 1.

Table 1. Summary of 2011 Vegetation Transect Sampling – transect allocation among soil groups and water pipeline segments.

Soil Group	Number of Transects (2011 Study)					
	S1		S2		S3	
	Total Sampled	Used to develop standard	Total Sampled	Used to develop standard	Total Sampled	Used to develop standard
Type A (Penrose, Manvel and Minnequa Soils)	7	4	13	11		
Type B (Limon and Heldt Soils)	1	1	6	6	7	1
Type C (Stoneham and Cascajo Soils)					4	4
Type D (Midway Shale Complex – Shingle Series)			1	1	3	3
Type E (Razor Series)					7	7
Type F (Haverson Series and Ustic Torrifluvents)			2	2	1	1

As can be seen in the above table, five transects from the S1 Section, 19 transects from the S2 Section and 16 transects from the S3 Section were used to develop the vegetation cover standards.

**Species Diversity.** There is no specific standard for species diversity presented in the 1041 Permit revegetation requirements. There are however provisions for species diversity to be considered. The permit states that *“Vegetation cover will be of the same seasonal variety native to the area of disturbed land, or species that support the post-construction land use.”* Also, the permit states that the revegetated area will be considered acceptable if *“..the revegetated area cover is not less than 90 percent of the pre-construction vegetation cover with similar species diversity.”*

**Noxious Weeds.** No specific standard for noxious weed species is included in the 1041 Permit. However, the provision is included that *“Applicant shall control spread of noxious weeds resulting from project construction.”*

## PERFORMANCE STANDARDS – REVIEW

Development of Standards. As noted above, the performance standards were developed based on the pre-construction vegetation sampling conducted in S1, S2 and S3. For some of the soil groups, there were no transects sampled in the S3 section (Group A -Penrose, Manvel, Minnequa). Also, data from six transects in the Limon and Heldt Series that were sampled in S3 (on the Walker Ranch Property) were not used to develop the cover standard because these transects were judged to have been heavily grazed. The mean cover values that were derived for each of the soil groups were multiplied by 0.90 to obtain the performance standards shown in Table 2.

Table 2. Summary of 2011 vegetation cover data used to develop the cover performance standards.

		1	2	3	4	5	6
Map Code	Soil Group	Pre-construction mean cover by native species (%)	Pre-construction mean cover by introduced species (%)	Percent vegetation cover that is the basis for the performance standard (Columns 1+2)	Native Species contribution to Cover standard (90% of column 1)	Introduced Species contribution to Cover standard (90% of Column 2)	Cover Standard (Columns 4 +5)
A	Penrose, Manvel and Minnequa Series	12.0	5.2	<b>17.2</b>	10.8	4.7	<b>15.5</b>
B	Limon and Heldt	24.75	1.75	<b>26.5</b>	22.3	1.6	<b>23.9</b>
C	Stoneham and Cascajo Series	33.5	1.5	<b>35</b>	30.2	1.3	<b>31.5</b>
D	Midway – Shale Complex; Shingle Series	16.75	0.25	<b>17</b>	15.1	0.2	<b>15.3</b>
E	Razor Series	22.43	0.86	<b>23.3</b>	20.2	0.8	<b>21.0</b>
F	Haverson Series; Ustic Torrifluvents	33.0	8.33	<b>41.3</b>	29.7	7.5	<b>37.2</b>

The 2011 pre-construction mean cover values used to develop the revegetation standards included all the different life forms that occurred along the transects, including introduced species. In general, only limited amounts of introduced species were encountered along the ROW prior to installation of the pipeline. The highest percentages of introduced species were encountered in the Group A and Group F soils.

Implementation of Standards. A common occurrence during the initial stages of vegetation development on reclaimed areas is the abundance of introduced annual weedy species. In order to assure that the vegetation cover standards were not being met based primarily on cover by these introduced species, a limit was placed on the amount of cover provided by these species that could be included in meeting the performance standards. Column 2 in Table 2 lists the percent cover by introduced species that was recorded in the various soil groups prior to pipeline construction and column 5 shows 90 percent of these values. For the purposes of evaluating whether or not the reclaimed areas meet the vegetation cover performance standards, the cover by introduced species on the reclaimed areas could not contribute any more cover than the values shown in column 5 in Table 2, even if the total cover by these species was greater than these values. For native species, all of the cover that was measured in the reclaimed areas could be used toward meeting the vegetation cover standards. Using this approach assured that the cover performance standards could not be met based on cover by introduced weedy species, alone.

The comparison of the reclaimed area vegetation cover values for each soil group and the corresponding vegetation cover standard for each soil group was made based on mean cover values derived from the sampling data, even though the results may be variable. Some of the variability resulted from inclusion of re-worked areas where the vegetation was in only its first year of growth.

## METHODS

Over the course of two years of field observations several different approaches were used to evaluate vegetation establishment and develop along the pipeline route. In 2013, three field trips to the site were conducted (April, July and September). On each of the trips, the pipeline route was walked and qualitatively checked relative to species composition, germination and seedling establishment and general vegetation development. In July 2013, counts of seedling density were made. (Results from this work were included in an earlier report and are not included here). In 2014, similar field trips were conducted in April, July and September. Beginning in April 2013, photographs were taken at fixed locations along the pipeline route. These photographs were re-taken during each of the field trips.

In September 2014, vegetation cover data were collected from each of the six soil groups using a point intercept sampling approach consistent with what was being used by the CSU plant ecology consultants. This method utilizes an ocular sighting device in conjunction with a transect. Sampling consists of evaluating what is "hit" by the crosshairs in the viewing field of the sighting device. The optical sighting device is a precision instrument that has been designed to reduce parallax, provide a clear bright viewing field, and to utilize very fine cross hairs so that the evaluation point is nearly dimensionless. At each random sampling location a transect 25 meters in length was randomly oriented. Data from 50 observation points were collected for each transect. For sampling, the sighting device is attached to a tripod which is leveled at each sampling point. (The optical sighting device and tripod set-up can be seen in most of the transect photographs included in a later section of this report). Observations were made on each side of the 25 meter transect at 1.0 meter intervals along the transect. In all, 49 transects were sampled in the six soil groups distributed as follows:

Penrose, Manvel and Minnequa	Soil Group A	2 Transects
Limon and Heldt	Soil Group B	15 Transects
Stoneham and Cascajo (along ROW)	Soil Group C	8 Transects
Stoneham and Cascajo (Staging Area)	Soil Group C	3 Transects
Midway Shale/Shingle Series	Soil Group D	5 Transects
Razor Series	Soil Group E	15 Transects
Haverson Series/Ustic Torrifluvents	Soil Group F	1 Transect

## General Comments

The entire length of the S3 section in Pueblo County is approximately 7.5 miles. Most of the section (5.25 miles approximately) is located on Walker Ranch properties south of Antelope Road. A short section (0.25 miles) immediately south of Antelope Road and the section north of Antelope Road to the Pueblo County Line (approximately 2.0 miles) include properties owned by several individuals. These lengths were used to develop approximate acreages for each of the six soil types. Measurements made on maps of the route showing the soil types were converted to distances in feet. These measurements were multiplied by 100, the approximate width of the pipeline route. The numbers of square feet for each soil type were then converted to acreages. Because of inherent inaccuracies of this approach, the acreage estimates should be considered to be approximate.

## RESULTS

Fixed Photo Locations. Photographs taken at various locations along the pipeline route are presented in Appendix B beginning on page 45. Some of the photos span the time period from April 2013 to September 2014. Others span only the 2014 time period. The purpose for taking the photos was to show vegetation development over the 2013-2014 period. Because of several intense precipitation events, the vegetation in some of the photos reflects re-seeding and management events and does not necessarily reflect slow vegetation development.

Species Diversity. Species diversity was evaluated by recording all the species that were observed during each of the site visits. These results are presented in Appendix Table A-8. In the initial site visits in 2013 few species were observed because the areas were newly seeded. Over the two years of observations overall species diversity increased. Native species increased from 15 species in April 2013 to 76 species in September 2014; introduced species increased from two species in April 2013 to 41 species in September 2014 and all species increased from 17 species in April 2013 to 117 species in September 2014.

Noxious Weeds. Noxious weeds were noted along the S3 section of the ROW, but mostly they occurred in scattered patches or as isolated individuals. The following species were observed:

### List B Species

Canada Thistle	<i>Cirsium arvense (Breea arvense)</i>
Musk Thistle	<i>Carduus nutans</i>
Flower of the Hour	<i>Hibiscus trionum</i>
Salt Cedar	<i>Tamarix ramosissima</i>

### List C Species

Cheatgrass	<i>Bromus tectorum</i>
Field Bindweed	<i>Convolvulus arvensis</i>
Halogeton	<i>Halogeton glomeratus</i>
Puncture Vine	<i>Tribulus terrestris</i>
Common Mullein	<i>Verbascum thapsus</i>

The only species that was commonly seen was halogeton, which occurred in the Limon and Heldt soil section at the southern end of the S3 Section of the ROW.



## Vegetation Cover Sampling Results (Early September, 2014)

Results from the vegetation cover sampling conducted in September 2014 are summarized in the follow section. Each of the soil groups is discussed separately. Tabular summaries and raw data are included in Appendix A. Photographs of each of the sampled transects are presented in Appendix C.

### Type A Soil Group (Penrose, Manvel and Minnequa Series)

- General Soil Description. Soils shallow over shale and limestone. In the S3 section, this soil type is limited in extent (approximately 3.3 acres). The only portion of this type occurred in Section 8 north of Antelope Road.
- Source of Data for Performance Standard. The performance standard was based on 15 transects sampled in the S1 and S2 Sections; no transects for this soil group were sampled in S3 in 2011.
- Performance Standard. The pre-construction base mean cover value for this type was 17.2 percent. **The revegetation cover performance standard (90% of the base value) is 15.5 percent.**
- September 2014 Sampling Results. In early September, two transects were sampled in this soil type. Mean cover by acceptable species for the two transects was **26 percent**, well above the required standard. Cover summaries are presented in Appendix Table A-1 and raw data for this soil group are presented in Appendix Table A-9.
- Comments. Some weedy species (mostly Russian thistle) still occur in the revegetated areas (8 percent cover). It is expected that these species will have reduced cover as the perennial grasses become better established.

### Type B Soil Group (Limon and Heldt Series)

- General Soil Description. Soils on clay-rich, salt affected alluvial material. In the S3 section, there are approximately 30.4 acres of this type mostly in the southernmost two miles of the S3 section. All of this soil type occurs on Walker Ranch Property.
- Source of Data for Performance Standard. Prior to construction in 2011, 14 transects were sampled in this type. One transect was sampled in the S1 Section, six were sampled in the S2 Section and seven were sampled in the S3 Section. While 14 transects were sampled, the performance standard was based on only eight of the transects (one from S1, six from S2 and one from S3). Data from six of the S3 transects located on the Walker Ranch property were not used because the sites were deemed to be too heavily grazed for the data to be representative of the soil type.
- Performance Standard. Based on data from the eight transects, the pre-construction base mean cover value for this type was 26.5 percent. **The revegetation cover performance standard (90% of the base value) is 23.9 percent.**
- September 2014 Sampling Results. In early September, 15 transects were sampled in this soil type. Mean cover by acceptable species for these transects was **24.4 percent**, which was slightly above the required standard. However, much of the southern section of this type was re-

worked or inter-seeded, so the transects in this portion of the ROW were sampled from first-year reclaimed areas and had low cover values. The low cover values from this section were mostly offset by higher values from other parts of the ROW to the degree that the mean cover was slightly greater than the cover performance standard. Cover summaries are presented in Appendix Table A-2 and raw data for this soil group are presented in Appendix Table A-10.

- Comments. While the mean cover by acceptable species exceeded the performance standard, there is quite a bit of variability in the transect sampling results. Cover values for acceptable species ranged between 2 and 46 percent. Portions of this soil type were re-seeded early in the 2014 growing season, and these are the areas that tend to have low cover by acceptable species and relatively high cover by introduced forb species. Since the re-worked areas are essentially in their first growing season, it is not surprising that the cover values for the seeded species are low.

#### Type C Soil Group (Stoneham and Cascajo Series)

- General Soil Description. Deep soils on early Pleistocene alluvium. In the S3 section, this soil group occurs mostly north of Antelope Road and in the staging area on the south side of Antelope Road. The staging area includes approximately 6.8 acres and there are approximately 16.6 acres along the pipeline route. Approximately 1.9 acres occur on the north end of the Walker Ranch property.
- Source of Data for Performance Standard. The performance standard was based on four transects sampled in the S3 Section. Three transects were located north of Antelope Road and one transect was located in the portion of this type located on the Walker Ranch Property.
- Performance Standard. Based on data from the four transects, the pre-construction base mean cover value for this type was 35 percent. **The revegetation cover performance standard (90% of the base value) is 31.5 percent.**
- September 2014 Sampling Results. In early September, 8 transects were sampled in this soil type along the ROW. Mean cover by acceptable species for these transects was **30.75 percent**, which was slightly less than the required standard. However, the pre-construction base mean cover value included 1.5 percent cover by non-native annual and biennial forbs. The allowable cover for introduced species is 90 percent of what was present prior to construction. For this type, the acceptable contribution by non-native species would be 1.35 percent. When this amount is added to the cover by acceptable species, the total vegetation cover value is **32.1 percent** for sections of this soil type along the ROW, which is slightly higher than the performance standard. Cover summaries for this soil group along the ROW are presented in Appendix Table A-3 and raw data for this soil group are presented in Appendix Table A-11.

The results discussed above exclude the Staging Area. Because general observations suggested that vegetation development in the staging area seemed less successful than other Stoneham/Cascajo sites, three additional transects were sampled in this area. Mean total vegetation cover for these transects was only 12.7 percent, which is well below the performance standard. If the data from all 11 transects in this type are summarized together, the mean total vegetation cover for the type is only 27.2 percent, which is below the performance standard. Cover summaries for this soil group along in the staging area are presented in Appendix Table A-4 and raw data for this soil group are presented in Appendix Table A-12.

- Comments. The Stoneham/Cascajo sites will need to be re-evaluated in order to evaluate whether or not the acceptable species increase to the degree that the performance standards are being met.

#### Type D Soil Group (Midway – Shale complex; Shingle Series)

- General Soil Description. Soils on weathered shales with active erosional removal. In the S3 section, there approximately 9.6 acres of this type and all occur on the Walker Ranch property.
- Source of Data for Performance Standard. The performance standard for this type was developed from four transects; one from the S2 Section and three from the S3 section.
- Performance Standard. Based on data from the four transects, the pre-construction base mean cover value for this type was 17.0 percent. **The revegetation cover performance standard (90% of the base value) is 15.3 percent.**
- September 2014 Sampling Results. In early September, five transects were sampled in this type, all of which were located on Walker Ranch property. Mean cover by acceptable species for these transects was **21.2 percent**, which was greater than the required standard. Cover summaries for this soil group are presented in Appendix Table A-5 and raw data for this soil group are presented in Appendix Table A-13.
- Comments. Prior to construction, the range of cover values was 12-24 percent. The vegetation cover values on the reclaimed sites ranged between 14 -34 percent.

#### Type E Soil Group (Razor Series)

- General Soil Description. Soils on deeply weathered shales without active erosional removal. These soils occur throughout S3 Section. Overall, approximately 30.1 acres occur with 21.5 acres occurring on the Walker Ranch Property.
- Source of Data for Performance Standard. The performance standard for this type was developed from seven transects all of which were located in the S3 Section. Five transects were located on Walker Ranch property and two transects were sampled north of Antelope Road.
- Performance Standard. Based on data from the seven transects, the pre-construction base mean cover value for this type was 23.3 percent. **The revegetation cover performance standard (90% of the base value) is 21 percent.**
- September 2014 Sampling Results. In early September, 15 transects were sampled in this type, 11 of which were located on Walker Ranch property. Mean cover by acceptable species for these 15 transects was **35.7 percent**, which was greater than the required standard. Cover summaries for this soil are presented in Appendix Table A-6 and raw data for this soil group are presented in Appendix Table A-14.
- Comments. Some of the best revegetation along the S3 section occurred in this soil type. On the Walker Ranch Property, the mean vegetation cover by acceptable species was 42.7 percent, which was approximately twice the standard. The results for portions of the Razor series located north of Antelope Road were not as good. Three of the four transects had less than 20 percent cover (two transects had less than 10 percent cover). These sparse transects occurred

in a section of the pipeline route that had been grazed by livestock in 2013. Also, there are prairie dogs in this part of the route.

#### Type F Soil Group (Haverson Series and Ustic Torrifluvents)

- **General Soil Description.** Soils on recent alluvium of moderate texture and salt content. This soil group occurs on sites where ephemeral drainages cross the pipeline route. The approximate extent of this type is only 0.9 acres and all of it was mapped in the part of the route located north of Antelope Road. (The Steel Hollow drainage was not mapped as this type.)
- **Source of Data for Performance Standard.** The performance standard for this type was developed from three transects; two from the S2 Section and one from the S3 section.
- **Performance Standard.** Based on data from the three transects, the pre-construction base mean cover value for this type was 41.3 percent. **The revegetation cover performance standard (90% of the base value) is 37.2 percent.**
- **September 2014 Sampling Results.** Because of the limited extent of this type only one transect was sampled in September 2014. Total vegetation cover by acceptable species was 30 percent. The pre-construction data for this type showed that six percent of the base vegetation cover was provided by introduced annual and biennial forbs and 2.33 percent was provided by introduced perennial forbs. This allows for 90 percent of 8.33 percent (7.5 percent) by non-native species to be included with the cover by acceptable species for a total vegetation cover value of **37.5 percent**, which is slightly greater than the performance standard.
- **Comments.** The bottom of the drainage adjacent to where the transect was sampled was partially flooded in early September. Also, it appeared that the extent of the ponded water was more extensive earlier in the summer. The flooded conditions have prevented the establishment of vegetation in the bottom of the drainage. The transect was sampled as close as possible to the edge of the flooded/previously flooded area.

#### DISCUSSION AND CONCLUSIONS

Species Diversity. Results from field observations and sampling data suggest that 1041 Permit requirements regarding species diversity are being met. The major species in the reclaimed areas are ones that were included in the seed mix and are also the primary species in the adjacent native vegetation. Many species that were not in the seed mix have also become established on the reclaimed area. Seeds for these species were present in the topsoil that was salvaged and then re-spread on the surface as part of the reclamation design.

Noxious Weeds. Even though noxious weed species were noted along the reclaimed pipeline section, they mostly occur in scattered patches or as isolated individuals. The only species that may still be a problem is halogeton, which is commonly seen in the southern part of the S3 section in the Limon and Heldt soil group.

Vegetation Cover. Of the requirements in the 1041 Permit, establishment of satisfactory cover in the various soil groups has received the most attention and has been the focus of most of the post-construction field evaluations. In general, revegetation along the S3 section has been successful, however some parts of the area have not yet satisfactorily met the vegetation cover standard. Table 3 presents a summary of the status of the vegetation based on the vegetation cover data collected in early September, 2014.

Table 3. Evaluation summary regarding attainment of vegetation cover performance standards for soil groups in the S3 Section of the SDS water pipeline in Pueblo County. Based on data collected September 2-4, 2014.

Map Code	Soil Group	Vegetation Cover Performance Standard (%)	Mean total Vegetation Cover (%) based on September 2014 Sampling	Mean Vegetation Cover by Native Species (%) September 2014	Allowable cover by introduced species (based on pre-construction data)	Total cover that can go toward meeting the performance standard	Decision
A	Penrose, Manvel and Minnequa Series	15.5	34	26	4.7	30.7	Standard Met
B	Limon and Heldt	23.9	26.5	24.7	1.6	26.3	Standard Met*
C	Stoneham and Cascajo Series -Right-of-Way	31.5	48.2	30.8	1.3	32.1	Standard Met**
C	Stoneham and Cascajo Series –Staging Area	31.5	60	12.7	1.3	14.0	Standard Not Met
D	Midway – Shale Complex; Shingle Series	15.3	35.6	21.2	0.2	21.4	Standard Met
E	Razor Series	21	46.1	35.7	0.8	36.5	Standard Met
F	Haverson Series; Ustic Torrifluvents	37.2	40	30.0	7.5	37.5	Standard Met

\* While the mean cover value shows that the standard was met, the areas that were repaired or re-worked in 2014 need to be evaluated before a final decision regarding performance standards is made.

\*\* When all the sampled transects for the Stoneham/Cascajo soil group are considered, the performance standard was not met.

The sampling results show that the cover standards for Soil Groups A, B, D and E were met based on native species alone. Even though the standard was shown to have been met for Group B, a considerable amount of repair work was conducted in the southern part of Group B soils in 2014. Any decision regarding whether the standard is being met for this Group should be delayed until data from the repaired areas is collected.

The data show that Soil Group C (Stoneham and Cascajo Series soils) has not yet met the performance standards when both the staging area and ROW data are combined. The data from the ROW alone suggest that the standard is being met when allowable cover data for introduced species is included.

The Group F soils are very limited in extent along the S3 Section and occur only in places where ephemeral drainages cross the ROW. Compared with the other soil groups, the Group F soils have more introduced species. The data show that the cover standard is not being met based only on native species, but when the allowable amounts of introduced species are included, the standard is being met. Because these areas are disturbed by periodic stream flows, it may be difficult to maintain consistent vegetation cover in this soil group.

## APPENDIX A

This appendix includes tabular summaries of the vegetation data collected in September 2014 for each of the six soil groups, the list of species observed along the right –of-way, and raw data for each of the sampled transects in each of the soil groups.



Appendix Table A-1. Mean cover values (%) for Soil Group A (Penrose, Manvel and Minnequa Series).  
Based on data from two 25-meter point transects. September 4, 2014.

SOIL GROUP A: PENROSE, MANVEL AND MINNEQUA		Mean Cover (%)
Vegetation Cover by Acceptable Species		26.0
Vegetation Cover by Weedy Species		8.0
Total Vegetation Cover		34.0
Litter		40.0
Rock		4.0
Bare Soil		22.0
<b>NATIVE SPECIES</b>		
<b>Warm Season Perennial Grasses</b>		
<i>Bouteloua curtipendula</i>		8.0
<i>Chondrosum gracile</i>		7.0
<i>Pleuraphis jamesii</i>		4.0
<i>Sporobolus airoides</i>		1.0
<i>Sporobolus cryptandrus</i>		2.0
Sub-total		22.0
<b>Cool Season Perennial Grasses</b>		
<i>Pascopyrum smithii</i>		3.0
Sub-total		3.0
<b>Perennial Forbs</b>		
<i>Astragalus sp.</i>		<1
<i>Heterotheca villosa</i>		<1
<i>Oligosporus dracunculus</i>		1.0
<i>Psoralidium tenuiflorum</i>		<1
<i>Sphaeralcea coccinea</i>		<1
Sub-total		1.0
<b>Agavoids</b>		
<i>Yucca glauca</i>		<1
<b>NON-NATIVE SPECIES</b>		
<b>Perennial Forbs</b>		
<i>Medicago sativa</i>		<1
<b>Annual Forbs</b>		
<i>Bassia sieversiana</i>		<1
<i>Conyza canadensis</i>		<1
<i>Melilotus officinalis</i>		1.0
<i>Salsola collina</i>		7.0
Sub-total		8.0

Appendix Table A-2. Mean cover values (%) for Soil Group B (Limon and Heldt Series). Based on data from 15 25-meter point transects. September 2, 2014.

SOIL GROUP B: LIMON AND HELDT		Mean Cover (%)
Vegetation Cover by Acceptable Species		24.40
Vegetation Cover by Weedy Species		19.20
Total Vegetation Cover		43.60
Litter		14.67
Rock		0.80
Bare Soil		40.80
<b>NATIVE SPECIES</b>		
<b>Warm Season Perennial Grasses</b>		
<i>Aristida purpurea</i>		<1
<i>Bothriochloa laguroides</i>		<1
<i>Bouteloua curtipendula</i>		3.33
<i>Chondrosum gracile</i>		2.67
<i>Muhlenbergia asperifolia</i>		<1
<i>Pleuraphis jamesii</i>		5.07
<i>Schedonnardus paniculatus</i>		0.13
<i>Sporobolus airoides</i>		5.07
<i>Sporobolus cryptandrus</i>		0.67
Sub-total		16.93
<b>Cool Season Perennial Grasses</b>		
<i>Elymus elymoides</i>		0.13
<i>Pascopyrum smithii</i>		4.53
Sub-total		4.67
<b>Perennial Forbs</b>		
<i>Asclepias subverticillata</i>		<1
<i>Astragalus bisulcatus</i>		0.53
<i>Erigeron divergens</i>		<1
<i>Glandularia bipinnatifida</i>		<1
<i>Grindelia squarrosa</i>		0.13
<i>Machaeranthera bigloevii</i>		<1
<i>Oonopsis foliosa</i>		<1
<i>Sphaeralcea angustifolia</i>		0.53
<i>Sphaeralcea coccinea</i>		0.40
<i>Suaeda sp.</i>		<1
<i>Thelysperma filifolium</i>		<1
Sub-total		1.60

Appendix Table A-2. (Continued) Mean cover values (%) for Soil Group B (Limon and Heldt Series).  
Based on data from 15 25-meter point transects. September 2, 2014.

SOIL GROUP B: LIMON AND HELDT	Mean Cover (%)
<b>Annual Forbs</b>	
<i>Amaranthus arenicola</i>	<1
<i>Chamaesyce glyptosperma</i>	<1
<i>Conyza coulteri</i>	0.13
<i>Dyssodia aurea</i>	0.13
<i>Quincula lobata</i>	<1
Sub-total	0.27
<b>Semi-Shrubs</b>	
<i>Gutierrezia sarothrae</i>	0.13
Sub-total	0.13
<b>Shrubs</b>	
<i>Atriplex canescens</i>	0.67
<i>Atriplex confertifolia</i>	<1
<i>Ceratoides lanata</i>	0.13
Sub-total	0.80
<b>NON-NATIVE SPECIES</b>	
<b>Annual Grasses</b>	
<i>Chloris verticillata</i>	<1
<i>Digitaria sanguinalis</i>	<1
<i>Panicum capillare</i>	<1
<i>Setaria viridis</i>	0.13
Sub-total	0.13
<b>Perennial Forbs</b>	
<i>Trifolium repens</i>	<1
Sub-total	<1
<b>Annual Forbs</b>	
<i>Bassia sieversiana</i>	2.27
<i>Chenopodium album</i>	<1
<i>Conyza canadensis</i>	<1
<i>Halogeton glomeratus</i>	0.27
<i>Helianthus annuus</i>	<1
<i>Melilotus officinalis</i>	0.27
<i>Portulaca oleracea</i>	<1
<i>Salsola australis</i>	0.93
<i>Salsola collina</i>	15.33
<i>Solanum rostratum</i>	<1
<i>Ximenesia encelioides</i>	<1
Sub-total	19.07
<b>Shrubs</b>	
<i>Prosopis (?)</i>	<1
Sub-total	<1

Appendix Table A-3. Mean cover values (%) for Soil Group C (Stoneham and Cascajo Series) along the pipeline right-of-way. Based on data from eight 25-meter point transects. September 3-4, 2014.

SOIL GROUP C: STONEHAM AND CASCAJO		Mean Cover (%)
Vegetation Cover by Acceptable Species		30.75
Vegetation Cover by Weedy Species		17.50
Total Vegetation Cover		48.25
Litter		21.50
Rock		6.00
Bare Soil		23.75
<b>NATIVE SPECIES</b>		
<b>Warm Season Perennial Grasses</b>		
<i>Bothriochloa laguroides</i>		<1
<i>Bouteloua curtipendula</i>		6.25
<i>Chondrosum gracile</i>		12.75
<i>Pleuraphis jamesii</i>		1.50
<i>Sorghastrum avenaceum</i>		<1
<i>Sporobolus airoides</i>		3.75
<i>Sporobolus cryptandrus</i>		1.75
<i>Sporobolus sp.</i>		2.00
Sub-total		28.00
<b>Cool Season Perennial Grasses</b>		
<i>Elymus elymoides</i>		<1
<i>Pascopyrum smithii</i>		2.00
Sub-total		2.00
<b>Perennial Forbs</b>		
<i>Gaillardia aristata</i>		<1
<i>Glandularia bipinnatifida</i>		<1
<i>Oenothera villosa</i>		<1
<i>Psoraleidum tenuiflorum</i>		<1
<i>Senecio flaccidus ssp. douglasii</i>		<1
<i>Sphaeralcea coccinea</i>		<1
<i>Zinnia grandiflora</i>		<1
Sub-total		<1
<b>Annual Forbs</b>		
<i>Conyza coulteri</i>		0.25
<i>Dyssodia aurea</i>		0.25
<i>Dyssodia papposa</i>		<1
Sub-total		0.50

Appendix Table A-3. (Continued) Mean cover values (%) for Soil Group C (Stoneham and Cascajo Series) along the pipeline right-of-way. Based on data from eight 25-meter point transects. September 3-4, 2014.

SOIL GROUP C: STONEHAM AND CASCAJO		Mean Cover (%)
<b>Semi-Shrubs</b>		
<i>Gutierrezia sarothrae</i>		<1
Sub-total		<1
<b>Shrubs</b>		
<i>Atriplex canescens</i>		0.25
Sub-total		0.25
<b>Agavoids</b>		
<i>Yucca glauca</i>		<1
Sub-total		<1
<b>NON-NATIVE SPECIES</b>		
<b>Cool Season Perennial Grasses</b>		
<i>Bromus inermis</i>		<1
Sub-total		<1
<b>Annual Grasses</b>		
<i>Bromus japonicus</i>		<1
<i>Chloris verticillata</i>		0.25
Sub-total		0.25
<b>Perennial Forbs</b>		
<i>Rumex crispus</i>		<1
Sub-total		<1
<b>Annual Forbs</b>		
<i>Bassia sieversiana</i>		2.50
<i>Conyza canadensis</i>		<1
<i>Helianthus annuus</i>		<1
<i>Melilotus alba</i>		<1
<i>Melilotus officinalis</i>		0.25
<i>Salsola australis</i>		0.75
<i>Salsola collina</i>		13.75
<i>Ximenesia encelioides</i>		<1
Sub-total		17.25
<b>Shrubs</b>		
<i>Prosopis (?)</i>		<1
Sub-total		<1

Appendix Table A-4. Mean cover values (%) for Soil Group C (Stoneham and Cascajo Series) in the Staging Area south of Antelope Road. Based on data from three 25-meter point transects. September 3-4, 2014.

SOIL GROUP C: STONEHAM AND CASCAJO - STAGING AREA	Mean Cover (%)
Vegetation Cover by Acceptable Species	12.67
Vegetation Cover by Weedy Species	47.33
Total Vegetation Cover	60.00
Litter	19.33
Rock	0.67
Bare Soil	20.00
<b>NATIVE SPECIES</b>	
<b>Warm Season Perennial Grasses</b>	
<i>Bouteloua curtipendula</i>	8.00
<i>Chondrosum gracile</i>	1.33
<i>Pleuraphis jamesii</i>	<1
<i>Sporobolus airoides</i>	0.67
<i>Sporobolus cryptandrus</i>	<1
<i>Sporobolus sp.</i>	<1
Sub-total	10.00
<b>Cool Season Perennial Grasses</b>	
<i>Pascopyrum smithii</i>	0.67
Sub-total	0.67
<b>Perennial Forbs</b>	
<i>Astragalus sp.</i>	<1
<i>Glandularia bipinnatifida</i>	2.00
<i>Rudbeckia hirta</i>	<1
<i>Sphaeralcea coccinea</i>	<1
<i>Zinnia grandiflora</i>	<1
Sub-total	2.00
<b>Annual Forbs</b>	
<i>Dyssodia aurea</i>	<1
<i>Dyssodia papposa</i>	<1
Sub-total	<1
<b>NON-NATIVE SPECIES</b>	
<b>Annual Forbs</b>	
<i>Bassia sieversiana</i>	1.33
<i>Melilotus officinalis</i>	<1
<i>Salsola collina</i>	46.00
<i>Ximenesia encelioides</i>	<1
Sub-total	47.33



Appendix Table A-5. Mean cover values (%) for Soil Group D (Midway Shale Complex and Shingle Series). Based on data from five 25-meter point transects. September 2-3, 2014.

SOIL GROUP D: MIDWAY SHALE COMPLEX AND SHINGLE SERIES		Mean Cover (%)
Vegetation Cover by Acceptable Species		21.20
Vegetation Cover by Weedy Species		14.40
Total Vegetation Cover		35.60
Litter		11.20
Rock		5.60
Bare Soil		47.60
<b>NATIVE SPECIES</b>		
<b>Warm Season Perennial Grasses</b>		
<i>Bothriochloa laguroides</i>		<1
<i>Bouteloua curtipendula</i>		4.00
<i>Chondrosum gracile</i>		2.80
<i>Pleuraphis jamesii</i>		3.60
<i>Schedonnardus paniculatus</i>		<1
<i>Sporobolus airoides</i>		6.40
<i>Sporobolus cryptandrus</i>		1.60
Sub-total		18.40
<b>Cool Season Perennial Grasses</b>		
<i>Elymus elymoides</i>		<1
<i>Pascopyrum smithii</i>		<1
Sub-total		<1
<b>Perennial Forbs</b>		
<i>Astragalus bisulcatus</i>		2.40
<i>Machaeranthera bigloevii</i>		<1
<i>Picradeniopsis oppositifolia</i>		<1
<i>Sphaeralcea angustifolia</i>		<1
<i>Sphaeralcea coccinea</i>		0.40
Sub-total		2.80
<b>Annual Forbs</b>		
<i>Chamaesyce glyptosperma</i>		<1
<i>Dyssodia aurea</i>		<1
<i>Quincula lobata</i>		<1
Sub-total		<1
<b>Shrubs</b>		
<i>Atriplex canescens</i>		<1
Sub-total		<1
<b>Cacti</b>		
<i>Opuntia polyacantha</i>		<1
Sub-total		<1

Appendix Table A-5. (Continued) Mean cover values (%) for Soil Group D (Midway Shale Complex and Shingle Series). Based on data from five 25-meter point transects. September 2-3, 2014.

SOIL GROUP D: MIDWAY SHALE COMPLEX AND SHINGLE SERIES		Mean Cover (%)
<b>NON-NATIVE SPECIES</b>		
<b>Annual Grasses</b>		
<i>Digitaria sanguinalis</i>		<1
Sub-total		<1
<b>Perennial Forbs</b>		
<i>Rumex crispus</i>		<1
Sub-total		<1
<b>Annual Forbs</b>		
<i>Bassia sieversiana</i>		0.40
<i>Chenopodium sp.</i>		0.00
<i>Halogeton glomeratus</i>		0.00
<i>Helianthus annuus</i>		0.00
<i>Portulaca oleracea</i>		0.00
<i>Salsola australis</i>		6.40
<i>Salsola collina</i>		7.60
<i>Ximenesia encelioides</i>		0.00
Sub-total		14.40

Appendix Table A-6. Mean cover values (%) for Soil Group E (Razor Series). Based on data from 15 25-meter point transects. September 2-4, 2014.

SOIL GROUP E: RAZOR SERIES		Mean Cover (%)
Vegetation Cover by Acceptable Species		35.7
Vegetation Cover by Weedy Species		10.4
Total Vegetation Cover		46.1
Litter		24.8
Rock		2.13
Bare Soil		26.9
<b>NATIVE SPECIES</b>		
<b>Warm Season Perennial Grasses</b>		
<i>Andropogon hallii</i>		0.13
<i>Bothriochloa laguroides</i>		<1
<i>Bouteloua curtipendula</i>		7.47
<i>Chondrosum gracile</i>		4.8
<i>Panicum sp.</i>		<1
<i>Panicum virgatum</i>		0.13
<i>Pleuraphis jamesii</i>		4.53
<i>Schedonnardus paniculatus</i>		0.4
<i>Sporobolus airoides</i>		9.33
<i>Sporobolus cryptandrus</i>		3.33
Sub-total		30.1
<b>Cool Season Perennial Grasses</b>		
<i>Agropyron dasystachyum</i>		<1
<i>Carex sp.</i>		<1
<i>Elymus elymoides</i>		0.13
<i>Pascopyrum smithii</i>		3.2
Sub-total		3.33
<b>Perennial Forbs</b>		
<i>Astragalus bisulcatus</i>		0.4
<i>Astragalus sp.</i>		<1
<i>Erigeron divergens</i>		0.13
<i>Gaillardia aristata</i>		<1
<i>Glandularia bipinnatifida</i>		0.4
<i>Lesquerella sp.</i>		<1
<i>Machaeranthera bigloevii</i>		0.13
<i>Machaeranthera pinnatifida</i>		<1
<i>Oligosporus dracunculus</i>		0.27
<i>Physalis virginiana</i>		<1
<i>Picradeniopsis oppositifolia</i>		<1

Appendix Table A-6. (Continued) Mean cover values (%) for Soil Group E (Razor Series). Based on data from 15 25-meter point transects. September 2-4, 2014.

SOIL GROUP E: RAZOR SERIES		Mean Cover (%)
<i>Solidago canadensis</i>		<1
<i>Sphaeralcea angustifolia</i>		0.13
<i>Sphaeralcea coccinea</i>		0.27
<i>Vicia americana</i>		<1
Sub-total		1.73
<b>Annual Forbs</b>		
<i>Conyza coulteri</i>		<1
<i>Dyssodia aurea</i>		0.4
<i>Dyssodia papposa</i>		0.13
<i>Quincula lobata</i>		<1
Sub-total		0.53
<b>Shrubs</b>		
<i>Atriplex canescens</i>		<1
Sub-total		<1
<b>Cacti</b>		
<i>Cylindropuntia imbricata</i>		
<i>Opuntia polyacantha</i>		<1
Sub-total		<1
<b>Agavoids</b>		
<i>Yucca glauca</i>		<1
Sub-total		<1
<b>NON-NATIVE SPECIES</b>		
<b>Warm Season Perennial Grasses</b>		
<i>Bothriochloa ischaemum</i>		<1
Sub-total		<1
<b>Annual Grasses</b>		
<i>Bromus japonicus</i>		
<i>Chloris verticillata</i>		<1
<i>Digitaria sanguinalis</i>		<1
<i>Setaria viridis</i>		<1
Sub-total		<1

Appendix Table A-6. (Continued) Mean cover values (%) for Soil Group E (Razor Series). Based on data from 15 25-meter point transects. September 2-4, 2014.

SOIL GROUP E: RAZOR SERIES		Mean Cover (%)
<b>Perennial Forbs</b>		
<i>Breea arvensis</i>		<1
<i>Rumex crispus</i>		<1
<i>Taraxacum officinale</i>		<1
<i>Trifolium pratense</i>		<1
Sub-total		<1
<b>Annual Forbs</b>		
<i>Bassia sieversiana</i>		2.13
<i>Chenopodium sp.</i>		0
<i>Conyza canadensis</i>		0
<i>Euphorbia sp.</i>		0
<i>Halogeton glomeratus</i>		0
<i>Helianthus annuus</i>		0
<i>Lepidium sp.</i>		0.13
<i>Melilotus officinalis</i>		0
<i>Salsola australis</i>		1.73
<i>Salsola collina</i>		6.4
<i>Verbena bracteata</i>		0
<i>Ximenesia encelioides</i>		0
Sub-total		10.4
<b>Shrubs</b>		
<i>Tamarix ramosissima</i>		<1
Sub-total		<1

Appendix Table A-7. Cover values (%) for Soil Group F (Haverson Series and Ustic Torrifuvents). Based on data from one 25-meter point transects. September 2-4, 2014.

SOIL GROUP F: HAVERSON SERIES AND USTIC TORRIFLUVENTS	Transect Number
	1
Vegetation Cover by Acceptable Species	30
Vegetation Cover by Weedy Species	10
Total Vegetation Cover	40
Litter	42
Rock	
Bare Soil	18
<b>NATIVE SPECIES</b>	
<b>Warm Season Perennial Grasses</b>	
<i>Chondrosum gracile</i>	<1
<i>Pleuraphis jamesii</i>	2
<i>Sporobolus airoides</i>	<1
<i>Pascopyrum smithii</i>	26
<i>Sporobolus cryptandrus</i>	<1
<i>Bouteloua curtipendula</i>	2
Sub-total	30
<b>Perennial Forbs</b>	
<i>Picradeniopsis oppositifolia</i>	<1
<i>Astragalus bisulcatus</i>	<1
Sub-total	<1
<b>Shrubs</b>	
<i>Atriplex canescens</i>	<1
Sub-total	<1
<b>NON-NATIVE SPECIES</b>	
<b>Annual Forbs</b>	
<i>Bassia sieversiana</i>	10
<i>Helianthus annuus</i>	<1
<i>Conyza canadensis</i>	<1
Sub-total	



Appendix Table A-8. List of species observed along the S3 Section of the SDS water pipeline route in Pueblo County.

Scientific Name	Common Name	Observation Date					
		04/30/13	7/24/2013 7/25/2013	09/12/13	4/29- 30/2014	07/22/14	9/2-4/2013
<b>NATIVE SPECIES</b>							
<b>WARM SEASON PERENNIAL GRASSES</b>							
<i>Andropogon gerardi</i>	Big Bluestem						x
<i>Andropogon hallii</i> (?)	Sandhills Bluestem						x
<i>Bothriochloa barbinodis</i>	Cane Bluestem						x
<i>Bothriochloa laguroides</i>	Silver Beardgrass						x
<i>Bouteloua curtipendula</i>	Side-oats Grama	x	x	x	x	x	x
<i>Buchloe dactyloides</i>	Buffalo Grass			x			
<i>Chondrosum gracile</i>	Blue Grama	x	x	x	x	x	x
<i>Muhlenbergia asperifolia</i>	Alkali Muhly			x			x
<i>Panicum sp.</i>	Panic Grass						x
<i>Panicum virgatum</i>	Switchgrass						x
<i>Pleuraphis jamesii</i>	Galleta Grass		x	x	x	x	x
<i>Sorghastrum avenaceum</i>	Yellow Indiangrass						x
<i>Schedonnardus paniculatus</i>	Tumblegrass					x	x
<i>Sporobolus airoides</i>	Alkali Sacaton		x	x	x	x	x
<i>Sporobolus cryptandrus</i>	Sand Dropseed		x	x	x	x	x
<i>Sporobolus sp.</i>	Dropseed				x	x	x
<b>COOL SEASON PERENNIAL GRASSES</b>							
<i>Aropyron dasystachyum</i>	Thickspike Wheatgrass						x
<i>Aristida purpurea</i>	Three-awn			x			x
<i>Carex sp.</i>	Sedge						x
<i>Elymus trachycaulus</i>	Slender Wheatgrass		x	x	x		x
<i>Pascopyrum smithii</i>	Western Wheatgrass	x	x	x	x	x	x
<i>Puccinellia airoides</i>	Alkali Grass			x			
<i>Sitanion longifolium</i>	Squirreltail Grass		x		x	x	x
<i>Critesion jubatum</i>	Foxtail Barley				x	x	x

Appendix Table A-8. (Continued) List of species observed along the S3 Section of the SDS water pipeline route in Pueblo County.

Scientific Name	Common Name	Observation Date					
		04/30/13	7/24/2013 7/25/2013	09/12/13	4/29- 30/2014	07/22/14	9/2-4/2013
<b>ANNUAL GRASSES</b>							
<i>Munroa squarrosa</i>	False Buffalo Grass		x	x			x
<b>PERENNIAL FORBS</b>							
<i>Argemone polyanthemos</i>	Prickly Poppy		x				x
<i>Asclepias latifolia</i>	Broadleaf Milkweed						x
<i>Asclepias subverticillata</i>	Milkweed		x	x			x
<i>Astragalus bisulcatus</i>	Two-grooved Milkvetch	x	x		x		x
<i>Astragalus sp.</i>	Milkvetch	x	x	x	x		x
<i>Cirsium undulatum</i>	Thistle	x	x				x
<i>Cucurbita foetidissima</i>	Wild Gourd						x
<i>Erigeron strigosus</i> (?)	Daisy Fleabane		x		x	x	x
<i>Eriogonum sp.</i>	Buckwheat		x				x
<i>Euphorbia marginata</i> (?)	Snow-on-the-Mountain		x				
<i>Evolvulus nuttallianus</i>	Evolvulus		x				
<i>Gaillardia aristata</i>	Blanket Flower		x				x
<i>Glandularia bipinnatifida</i>	Showy Vervain	x	x	x	x	x	x
<i>Grindelia squarrosa</i>	Curlycup Gumweed		x	x		x	x
<i>Heterotheca villosa</i>	Golden Aster		x				x
<i>Ipomopsis sp.</i>	Gilia				x	x	x
<i>Lesquerella sp.</i>	Bladderpod	x			x	x	x
<i>Linum lewisii</i>	Blue Flax		x		x		
<i>Lomatium orientale</i> (?)	Biscuitroot	x			x		
<i>Machaeranthera bigloevii</i>	Machaeranthera					x	x
<i>Machaeranthera canescens</i>	Machaeranthera						x
<i>Machaeranthera pinnatifida</i>	Machaeranthera						x
<i>Oenothera caespitosa</i>	Gumbo Lily				x		
<i>Oenothera villosa</i>	Evening Primrose						x
<i>Oligosporus dracunculus</i>	False Tarragon		x		x	x	x

Appendix Table A-8. (Continued) List of species observed along the S3 Section of the SDS water pipeline route in Pueblo County.

Scientific Name	Common Name	Observation Date					
		04/30/13	7/24/2013 7/25/2013	09/12/13	4/29- 30/2014	07/22/14	9/2-4/2013
<i>Oonopsis foliosa</i>	Leafy False Goldenweed						x
<i>Physalis hederifolia</i>	Ground Cherry			x			x
<i>Physalis virginiana</i>	Ground Cherry						x
<i>Physaria</i> sp.	Double Bladderpod			x			
<i>Picradeniopsis oppositifolia</i>	Bahia		x				x
<i>Polanisia dodecandra</i>	Clammy Weed		x				x
<i>Psoralea lanceolata</i>	Scurfpea		x	x			x
<i>Psoralegium tenuiflorum</i>	Scurfpea						x
<i>Rudbeckia hirta</i>	Black-eyed Susan						x
<i>Senecio flaccidus</i> subsp. <i>douglasii</i>	Goldenweed				x	x	x
<i>Solidago canadensis</i>	Canada Goldenrod						x
<i>Sphaeralcea angustifolia</i>	Globe Mallow			x	x	x	x
<i>Sphaeralcea coccinea</i>	Scarlet Globemallow	x	x	x	x	x	x
<i>Stanley pinnata</i>	Prince's Plume					x	
<i>Stephanomeria pauciflora</i>	Wire Lettuce		x				x
<i>Thelesperma filifolium</i>	Plains Greenthread						x
<i>Zinnia grandiflora</i>	Zinnia		x	x		x	x
<b>ANNUAL/BIENNIAL FORBS</b>							
<i>Amaranthus arenicola</i>	Pigweed			x			x
<i>Chamaesyce glyptosperma</i>	Spurge		x	x		x	x
<i>Chamaesyce stictospora</i>	Spurge		x				
<i>Chenopodium leptophyllum</i>	Narrowleaved Goosefoot	x	x				x
<i>Conza coulteri</i>	Coulter Horseweed						x
<i>Cryptantha</i> sp.	Cryptantha		x				
<i>Descurainia pinnata</i>	Tansy Mustard		x	x	x		
<i>Dyssodia aurea</i>	Fetid Marigold	x	x	x			x
<i>Dyssodia papposa</i>	Fetid Marigold			x		x	x
<i>Lappula redowskii</i>	Stickseed		x		x		

Appendix Table A-8. (Continued) List of species observed along the S3 Section of the SDS water pipeline route in Pueblo County.

Scientific Name	Common Name	Observation Date					
		04/30/13	7/24/2013 7/25/2013	09/12/13	4/29- 30/2014	07/22/14	9/2-4/2013
<i>Lepidium densiflorum</i>	Peppergrass		x	x			
<i>Lepidium sp.</i>	Peppergrass					x	x
<i>Machaeranthera sp.</i>	Machaeranthera			x			
<i>Nuttallia decapetala</i>	White Evening Star		x	x	x		x
<i>Plantago patagonica</i>	Woolly Plantain		x		x		
<i>Quincula lobata</i>	Chinese Lantern		x	x			x
<i>Suaeda sp.</i>	Sea-Blite			x			x
<i>Tripterocalyx micranthus</i>	Sand Verbena		x				
<b>SEMI-SHRUBS</b>							
<i>Gutierrezia sarothrae</i>	Broom Snakeweed				x		x
<b>SHRUBS</b>							
<i>Atriplex canescens</i>	Four-wing Saltbush	x	x	x	x	x	x
<i>Atriplex confertifolia</i>	Shadscale			x			x
<i>Chrysothamnus nauseosus</i>	Rubber Rabbitbrush				x		x
<i>Krascheninnikovia lanata</i>	Winterfat						x
<b>TREES</b>							
<i>Populus sargentii</i>	Plains Cottonwood			x			
<b>CACTI</b>							
<i>Cylindropuntia imbricata</i>	Cholla		x	x	x	x	x
<i>Opuntia polyacantha</i>	Plains Prickly-pear Cactus	x	x	x	x		x
<b>AGAVOIDS</b>							
<i>Yucca glauca</i>	Spanish Bayonet	x	x	x	x	x	x
Total Number of Native Species		15	46	38	33	28	76

Appendix Table A-8. (Continued) List of species observed along the S3 Section of the SDS water pipeline route in Pueblo County.

Scientific Name	Common Name	Observation Date					
		04/30/13	7/24/2013 7/25/2013	09/12/13	4/29- 30/2014	07/22/14	9/2-4/2013
NON-NATIVE SPECIES							
WARM SEASON PERENNIAL GRASSES							
<i>Bothriochloa ischaemum</i>	Yellow Bluestem						x
COOL SEASON PERENNIAL GRASSES							
<i>Bromus inermis</i>	Smooth Brome						x
ANNUAL GRASSES							
<i>Bromus japonicas</i>	Japanese Brome		x			x	x
<i>Bromus tectorum</i> **	Cheatgrass		x	x	x		
<i>Chloris verticillata</i>	Windmill Grass			x			x
<i>Chloris virgate</i>	Windmill Grass						x
<i>Digitaria sanguinalis</i>	Crab Grass		x	x			x
<i>Echinochloa crus-galli</i>	Barnyard Grass		x	x		x	x
<i>Eragrostis cilianensis</i>	Lovegrass			x			
<i>Panicum capillare</i>	Witchgrass		x	x			x
<i>Setaria sp.</i>	Foxtail			x			
<i>Setaria viridis</i>	Green Foxtail		x	x			x
<i>Sorghum halepense</i>	Sudan Grass						x
PERENNIAL FORBS							
<i>Convolvulus arvensis</i> **	Field Bindweed		x		x		x
<i>Cirsium (Breea) arvense</i> *	Canada Thistle		x	x	x		x
<i>Malva neglecta</i>	Cheeseweed		x	x	x		
<i>Medicago sativa</i>	Alfalfa						x
<i>Rumex crispus</i>	Curly Dock			x	x		x
<i>Taraxacum officinale</i>	Common Dandelion				x		x
<i>Trifolium pretense</i>	Red Clover		x	x	x		x
<i>Trifolium repens</i>	White Clover						x

\*Colorado Noxious Weed B List Species; \*\*Colorado Noxious Weed C List Species

Appendix Table A-8. (Continued) List of species observed along the S3 Section of the SDS water pipeline route in Pueblo County.

Scientific Name	Common Name	Observation Date					
		04/30/13	7/24/2013 7/25/2013	09/12/13	4/29- 30/2014	07/22/14	9/2-4/2013
ANNUAL/BIENNIAL FORBS							
Amaranthus albus	White Pigweed		x	x			
Amaranthus graecizans	Pigweed		x				x
Amaranthus retroflexus	Pigweed		x	x			x
Artemisia biennis	Biennial Wormwood		x			x	
Bassia sieversiana	Kochia		x	x	x	x	x
Carduus nutans*	Musk Thistle			x	x		
Chamaesyce serpyllifolia	Spurge			x			
Chenopodium album	Goosefoot						x
Chenopodium sp.	Goosefoot	x	x	x	x	x	x
Conyza Canadensis	Horseweed			x		x	x
Daucus carota	Queen Anne's Lace					x	x
Descurainia sp.	Tansy Mustard	x					
Erodium cicutarium	Filaree			x			
Erysimum repandum	Wallflower		x		x	x	
Euphorbia sp.	Spurge						x
Halogeton glomeratus**	Halogeton		x	x	x	x	x
Helianthus annuus	Annual Sunflower			x		x	x
Hibiscus trionum*	Flower-of-the-Hour			x			x
Lactuca serriola	Prickly Lettuce			x			
Matricaria sp.	False Chamomile					x	
Melilotus alba	White Sweetclover		x				x
Melilotus officinalis	Yellow Sweetclover		x	x	x		x
Portulaca oleracea	Purslane		x	x			x
Salsola australis	Russian Thistle		x	x	x	x	x
Salsola collina	Russian Thistle		x	x	x	x	x
Solanum physalifolium	Nightshade			x			
Solanum rostratum	Buffalo Bur		x	x		x	x
Solanum triflorum	Nightshade		x	x			

\*Colorado Noxious Weed B List Species; \*\*Colorado Noxious Weed C List Species

Appendix Table A-8. (Continued) List of species observed along the S3 Section of the SDS water pipeline route in Pueblo County.

Scientific Name	Common Name	Observation Date					
		04/30/13	7/24/2013 7/25/2013	09/12/13	4/29- 30/2014	07/22/14	9/2-4/2013
<b><i>Tribulus terrestris</i>**</b>	Caltrop			x			x
<b><i>Verbascum thapsus</i>**</b>	Common Mullein				x	x	x
<i>Verbena bracteata</i>	Creeping Charlie		x	x		x	x
<i>Ximenesia encelioides</i>	Cowpen Daisy		x	x		x	x
<i>Xanthium strumarium</i>	Cocklebur			x			x
<b>SHRUBS</b>							
<i>Prosopis</i> (?)	Mesquite						x
<b><i>Tamarix ramosissima</i>*</b>	Salt Cedar						x
Number of Native Species		15	46	38	33	28	76
Number of Non-Native Species		2	27	35	16	17	41
Total Number of Species		17	73	73	49	45	117

\*Colorado Noxious Weed B List Species; \*\*Colorado Noxious Weed C List Species

Appendix Table A-9. Transect sampling data for Soil Group A – Penrose Manvel and Minnequa Series.  
Values in percent. September 3, 2014.

SOIL GROUP A: PENROSE, MANVEL AND MINNEQUA SERIES	Transect Number		Mean
	1	2	
Vegetation Cover by Acceptable Species	24	28	26
Vegetation Cover by Weedy Species	2	14	8
Total Vegetation Cover	26	42	34
Litter	46	34	40
Rock	2	6	4
Bare Soil	26	18	22
<b>NATIVE SPECIES</b>			
<b>Warm Season Perennial Grasses</b>			
<i>Bouteloua curtipendula</i>	12	4	8
<i>Chondrosum gracile</i>	6	8	7
<i>Pleuraphis jamesii</i>	<1	8	4
<i>Sporobolus airoides</i>		2	1
<i>Sporobolus cryptandrus</i>		4	2
Sub-total	18	26	22
<b>Cool Season Perennial Grasses</b>			
<i>Pascopyrum smithii</i>	6		3
Sub-total	6		3
<b>Perennial Forbs</b>			
<i>Astragalus sp.</i>	<1		<1
<i>Heterotheca villosa</i>		<1	<1
<i>Oligosporus dracunculus</i>	<1	2	1
<i>Psoraleidum tenuiflorum</i>	<1		<1
<i>Sphaeralcea coccinea</i>	<1	<1	<1
Sub-total	<1	2	1
<b>Agavoids</b>			
<i>Yucca glauca</i>		<1	<1
<b>NON-NATIVE SPECIES</b>			
<b>Perennial Forbs</b>			
<i>Medicago sativa</i>		<1	<1
Sub-total		<1	<1
<b>Annual Forbs</b>			
<i>Bassia sieversiana</i>		<1	<1
<i>Conyza canadensis</i>	<1		<1
<i>Melilotus officinalis</i>	2		1
<i>Salsola collina</i>	<1	14	7
Sub-total	2	14	8



Appendix Table A-10. Transect sampling data for Soil Group B – Limon and Heldt Series. Values in percent. September 2, 2014.

SOIL GROUP B: LIMON AND HELDT SERIES	Transect Number															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Vegetation Cover by Acceptable Species	12	46	20	24	26	30	22	16	30	46	20	16	2	18	38	24.4
Vegetation Cover by Weedy Species	18	4	22	4	12	18	0	4	0	34	52	20	48	38	14	19.2
Total Vegetation Cover	30	50	42	28	38	48	22	20	30	80	72	36	50	56	52	43.6
Litter	16	12	16	26	18	12	14	22	10	12	6	12	4	14	26	14.7
Rock		2	2	4	2								2			0.8
Bare Soil	54	36	40	42	42	40	64	58	60	6	22	52	44	30	22	40.8
<b>NATIVE SPECIES</b>																
<b>Warm Season Perennial Grasses</b>																
<i>Aristida purpurea</i>			<1													
<i>Bothriochloa laguroides</i>		<1														
<i>Bouteloua curtipendula</i>	<1	4	4	6	4	4	2	<1	6	4	4	<1	<1	4	8	3.3
<i>Chondrosum gracile</i>		<1	4	4	4	2	2	2		10	6	2	<1	4		2.7
<i>Muhlenbergia asperifolia</i>						<1										<1
<i>Pleuraphis jamesii</i>		6		8	6	6	6	4	16	4	2	2		4	12	5.1
<i>Schedonnardus paniculatus</i>										2						0.1
<i>Sporobolus airoides</i>	<1	2	<1	2	6	12	4	8	4	14	2	12	2	<1	8	5.1
<i>Sporobolus cryptandrus</i>			2		2					<1	<1	<1		6		0.7
Sub-total	<1	12	10	20	22	24	14	14	26	34	14	16	2	18	28	16.9
<b>Cool Season Perennial Grasses</b>																
<i>Elymus elymoides</i>			2							<1					<1	0.1
<i>Pascopyrum smithii</i>	10	22	4	4	2	4	8	<1	4	2	6	<1		<1	2	4.5
Sub-total	10	22	6	4	2	4	8	<1	4	2	6	<1		<1	2	4.7

Appendix Table A-10. (Continued) Transect sampling data for Soil Group B – Limon and Heldt Series. Values in percent. September 2, 2014.

SOIL GROUP B: LIMON AND HELDT SERIES	Transect Number															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<b>Perennial Forbs</b>																
<i>Asclepias subverticillata</i>		<1	<1													<1
<i>Astragalus bisulcatus</i>		2		<1		<1	<1			<1		<1			6	0.5
<i>Erigeron divergens</i>		<1													<1	<1
<i>Glandularia bipinnatifida</i>		<1				<1			<1							<1
<i>Grindelia squarrosa</i>		<1		<1	<1					2	<1				<1	0.1
<i>Machaeranthera bigloevii</i>											<1			<1		<1
<i>Oonopsis foliosa</i>		<1	<1		<1											<1
<i>Sphaeralcea angustifolia</i>		6		<1	<1	<1	<1			2	<1					0.5
<i>Sphaeralcea coccinea</i>	2		2	<1			<1			2				<1		0.4
<i>Suaeda sp.</i>										<1	<1					<1
<i>Thelysperma filifolium</i>														<1		<1
Sub-total	2	8	2	<1	<1	<1	<1		<1	6	<1	<1		<1	6	1.6
<b>Annual Forbs</b>																
<i>Amaranthus arenicola</i>								<1	<1							<1
<i>Chamaesyce glyptosperma</i>		<1				<1										<1
<i>Conyza coulteri</i>		2	<1							<1		<1			<1	0.1
<i>Dyssodia aurea</i>	<1	<1				2									<1	0.1
<i>Quincula lobata</i>	<1														<1	<1
Sub-total	<1	2	<1			2		<1	<1	<1		<1			<1	0.3
<b>Semi-Shrubs</b>																
<i>Gutierrezia sarothrae</i>		2	<1	<1	<1											0.1
Sub-total		2	<1	<1	<1											0.1

Appendix Table A-10. (Continued) Transect sampling data for Soil Group B – Limon and Heldt Series. Values in percent. September 2, 2014.

SOIL GROUP B: LIMON AND HELDT SERIES	Transect Number															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<b>Shrubs</b>																
<i>Atriplex canescens</i>		<1			2			2		4	<1	<1		<1	2	0.7
<i>Atriplex confertifolia</i>					<1											<1
<i>Ceratoides lanata</i>			2													0.1
Sub-total		<1	2	<1	2			2		4	<1	<1		<1	2	0.8
<b>NON-NATIVE SPECIES</b>																
<b>Annual Grasses</b>																
<i>Chloris verticillata</i>				<1							<1					<1
<i>Digitaria sanguinalis</i>										<1						<1
<i>Panicum capillare</i>								<1								<1
<i>Setaria viridis</i>		2														0.1
Sub-total		2		<1				<1		<1	<1					0.1
<b>Perennial Forbs</b>																
<i>Trifolium repens</i>		<1														<1
Sub-total		<1														<1
<b>Annual Forbs</b>																
<i>Bassia sieversiana</i>	16			2	2			4	<1	4		<1		<1	6	2.3
<i>Chenopodium album</i>						<1										<1
<i>Conyza canadensis</i>				<1											<1	<1
<i>Halogeton glomeratus</i>		<1	4	<1	<1	<1			<1	<1	<1	<1	<1			0.3
<i>Helianthus annuus</i>						<1				<1					<1	<1
<i>Melilotus officinalis</i>			2							2				<1		0.3
<i>Portulaca oleracea</i>															<1	<1
<i>Salsola australis</i>							<1						12	2		0.9

Appendix Table A-10. (Continued) Transect sampling data for Soil Group B – Limon and Heldt Series. Values in percent. September 2, 2014.

SOIL GROUP B: LIMON AND HELDT SERIES	Transect Number															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<i>Salsola collina</i>	2	2	16	2	10	18				28	52	20	36	36	8	15.3
<i>Solanum rostratum</i>		<1														<1
<i>Ximenesia encelioides</i>		<1				<1										<1
Sub-total	18	2	22	4	12	18	<1	4	<1	34	52	20	48	38	14	19.1
<b>Shrubs</b>																
<i>Prosopis (?)</i>		<1														<1
Sub-total		<1														<1

Appendix Table A-11. Transect sampling data for Soil Group C – Stoneham and Cascajo Series along the waterline right-of-way. Values in percent. September 3-4, 2014.

SOIL GROUP C: STONEHAM AND CASCAJO SERIES	Transect Number								Mean
	1	2	3	4	5	6	7	8	
Vegetation Cover by Acceptable Species	46	14	22	34	22	34	40	34	30.75
Vegetation Cover by Weedy Species	12	52	32	14	16	6	2	6	17.5
Total Vegetation Cover	58	66	54	48	38	40	42	40	48.25
Litter	30	10	34	20	16	24	28	10	21.5
Rock		6		4	8	10	4	16	6
Bare Soil	12	18	12	28	38	26	24	32	23.75
<b>NATIVE SPECIES</b>									
<b>Warm Season Perennial Grasses</b>									
<i>Bothriochloa laguroides</i>	<1		<1						<1
<i>Bouteloua curtipendula</i>	6	10	8	10	6	6	4		6.25
<i>Chondrosium gracile</i>	8	2	6	6	12	26	26	16	12.75
<i>Pleuraphis jamesii</i>	<1	<1	<1	<1	<1	2	8	2	1.5
<i>Sorghastrum avenaceum</i>		<1							<1
<i>Sporobolus airoides</i>	8	<1	6	10	4	<1	<1	2	3.75
<i>Sporobolus cryptandrus</i>	2		<1		<1	<1	2	10	1.75
<i>Sporobolus sp.</i>	16	<1		<1					2
Sub-total	40	12	20	26	22	34	40	30	28
<b>Cool Season Perennial Grasses</b>									
<i>Elymus elymoides</i>	<1	<1		<1	<1	<1	<1		<1
<i>Pascopyrum smithii</i>	4			8		<1	<1	4	2
Sub-total	4	<1		8	<1	<1	<1	4	2
<b>Perennial Forbs</b>									
<i>Gaillardia aristata</i>	<1								<1
<i>Glandularia bipinnatifida</i>	<1	<1	<1	<1					<1
<i>Oenothera villosa</i>			<1						<1
<i>Psoralidium tenuiflorum</i>						<1			<1
<i>Senecio flaccidus ssp. douglasii</i>				<1					<1
<i>Sphaeralcea coccinea</i>		<1		<1					<1
<i>Zinnia grandiflora</i>					<1				<1
Sub-total	<1	<1	<1	<1	<1	<1			<1
<b>Annual Forbs</b>									
<i>Conyza coulteri</i>	<1	2							0.25
<i>Dyssodia aurea</i>	<1		2						0.25
<i>Dyssodia papposa</i>	<1		<1						<1
Sub-total	<1	2	2						0.5
<b>Semi-Shrubs</b>									
<i>Gutierrezia sarothrae</i>								<1	<1
Sub-total								<1	<1

Appendix Table A-11. (Continued) Transect sampling data for Soil Group C – Stoneham and Cascajo Series along the waterline right-of-way. Values in percent. September 3-4, 2014.

SOIL GROUP C: STONEHAM AND CASCAJO SERIES	Transect Number								Mean
	1	2	3	4	5	6	7	8	
<b>Shrubs</b>									
<i>Atriplex canescens</i>	2								0.25
Sub-total	2								0.25
<b>Agavoids</b>									
<i>Yucca glauca</i>					<1				<1
Sub-total					<1				<1
<b>NON-NATIVE SPECIES</b>									
<b>Cool Season Perennial Grasses</b>									
<i>Bromus inermis</i>				<1					<1
Sub-total				<1					<1
<b>Annual Grasses</b>									
<i>Bromus japonicus</i>				<1					<1
<i>Chloris verticillata</i>	2								0.25
Sub-total	2			<1					0.25
<b>Perennial Forbs</b>									
<i>Rumex crispus</i>	<1								<1
Sub-total									<1
<b>Annual Forbs</b>									
<i>Bassia sieversiana</i>	<1	<1	8	2	10	<1		<1	2.5
<i>Conyza canadensis</i>		<1	<1	<1					<1
<i>Helianthus annuus</i>			<1						<1
<i>Melilotus alba</i>			<1						<1
<i>Melilotus officinalis</i>				2					0.25
<i>Salsola australis</i>				6					0.75
<i>Salsola collina</i>	10	52	24	4	6	6	2	6	13.75
<i>Ximenesia encelioides</i>			<1						<1
Sub-total	10	52	32	14	16	6	2	6	17.25
<b>Shrubs</b>									
<i>Prosopis (?)</i>	<1								<1
Sub-total	<1								<1

Appendix Table A-12. Transect sampling data for Soil Group C – Stoneham and Cascajo Series in the Staging Area south of Antelope Road. Values in percent. September 3-4, 2014.

SOIL GROUP C: STONEHAM AND CASCAJO SERIES - STAGING AREA	Transect Number			Mean
	1	2	3	
Vegetation Cover by Acceptable Species	14	12	12	12.7
Vegetation Cover by Weedy Species	48	52	42	47.3
Total Vegetation Cover	62	64	54	60.0
Litter	16	22	20	19.3
Rock			2	0.7
Bare Soil	22	14	24	20.0
<b>NATIVE SPECIES</b>				
<b>Warm Season Perennial Grasses</b>				
<i>Bouteloua curtipendula</i>	6	10	8	8.0
<i>Chondrosum gracile</i>	<1	2	2	1.3
<i>Pleuraphis jamesii</i>	<1	<1	<1	<1
<i>Sporobolus airoides</i>		<1	2	0.7
<i>Sporobolus cryptandrus</i>		<1		<1
<i>Sporobolus sp.</i>	<1			<1
Sub-total	6	12	12	10.0
<b>Cool Season Perennial Grasses</b>				
<i>Pascopyrum smithii</i>	2			0.7
Sub-total	2			0.7
<b>Perennial Forbs</b>				
<i>Astragalus sp.</i>			<1	<1
<i>Glandularia bipinnatifida</i>	6		<1	2.0
<i>Rudbeckia hirta</i>	<1			<1
<i>Sphaeralcea coccinea</i>		<1	<1	<1
<i>Zinnia grandiflora</i>		<1		<1
Sub-total	6	<1	<1	2.0
<b>Annual Forbs</b>				
<i>Dyssodia aurea</i>			<1	<1
<i>Dyssodia papposa</i>	<1		<1	<1
Sub-total	<1		<1	<1
<b>NON-NATIVE SPECIES</b>				
<b>Annual Forbs</b>				
<i>Bassia sieversiana</i>			4	1.3
<i>Melilotus officinalis</i>	<1			<1
<i>Salsola collina</i>	48	52	38	46.0
<i>Ximenesia encelioides</i>	<1	<1		<1
Sub-total	48	52	42	47.3

Appendix Table A-13. Transect sampling data for Soil Group D – Midway – Shale Complex and Shingle Series. Values in percent. September 2-3, 2014.

SOIL GROUP D: MIDWAY SHALE COMPLEX AND SHINGLE SERIES	Transect Number					Mean
	1	2	3	4	5	
Vegetation Cover by Acceptable Species	18	24	16	14	34	21.2
Vegetation Cover by Weedy Species	22	30	18	2	0	14.4
Total Vegetation Cover	40	54	34	16	34	35.6
Litter	12	10	6	6	22	11.2
Rock	4	4	6	14		5.6
Bare Soil	44	32	54	64	44	47.6
<b>NATIVE SPECIES</b>						
<b>Warm Season Perennial Grasses</b>						
<i>Bothriochloa laguroides</i>				<1		<1
<i>Bouteloua curtipendula</i>	2	6	2	4	6	4
<i>Chondrosum gracile</i>	<1	6	6	<1	2	2.8
<i>Pleuraphis jamesii</i>	2	4		4	8	3.6
<i>Schedonnardus paniculatus</i>				<1		<1
<i>Sporobolus airoides</i>	14	4	4	4	6	6.4
<i>Sporobolus cryptandrus</i>		4	4		<1	1.6
Sub-total	18	24	16	12	22	18.4
<b>Cool Season Perennial Grasses</b>						
<i>Elymus elymoides</i>			<1			<1
<i>Pascopyrum smithii</i>			<1	<1		<1
Sub-total			<1	<1		<1
<b>Perennial Forbs</b>						
<i>Astragalus bisulcatus</i>		<1			12	2.4
<i>Machaeranthera bigloevii</i>		<1			<1	<1
<i>Picradeniopsis oppositifolia</i>		<1				<1
<i>Sphaeralcea angustifolia</i>			<1			<1
<i>Sphaeralcea coccinea</i>		<1	<1	2	<1	0.4
Sub-total		<1	<1	2	12	2.8
<b>Annual Forbs</b>						
<i>Chamaesyce glyptosperma</i>			<1			<1
<i>Dyssodia aurea</i>		<1				<1
<i>Quincula lobata</i>		<1				<1
Sub-total		<1	<1			<1
<b>Shrubs</b>						
<i>Atriplex canescens</i>		<1			<1	<1
Sub-total		<1			<1	<1
<b>Cacti</b>						
<i>Opuntia polyacantha</i>				<1		<1
Sub-total				<1		<1



Appendix Table A-13. (Continued) Transect sampling data for Soil Group D – Midway – Shale Complex and Shingle Series. Values in percent. September 2-3, 2014.

SOIL GROUP D: MIDWAY SHALE COMPLEX AND SHINGLE SERIES	Transect Number					Mean
	1	2	3	4	5	
<b>NON-NATIVE SPECIES</b>						
<b>Annual Grasses</b>						
<i>Digitaria sanguinalis</i>				<1		<1
Sub-total				<1		<1
<b>Perennial Forbs</b>						
<i>Rumex crispus</i>		<1				<1
Sub-total		<1				<1
<b>Annual Forbs</b>						
<i>Bassia sieversiana</i>		2				0.4
<i>Chenopodium sp.</i>		<1		<1	<1	0
<i>Halogeton glomeratus</i>	<1					0
<i>Helianthus annuus</i>				<1		0
<i>Portulaca oleracea</i>				<1		0
<i>Salsola australis</i>	4	28	<1	<1		6.4
<i>Salsola collina</i>	18	<1	18	2	<1	7.6
<i>Ximenesia encelioides</i>		<1				0
Sub-total	22	30	18	2	<1	14.4

Appendix Table A-14. Transect sampling data for Soil Group E – Razor Series. Values in percent. September 2-4, 2014.

SOIL GROUP E: RAZOR SERIES	Transect Number															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Vegetation Cover by Acceptable Species	34	62	36	30	48	40	66	34	30	40	50	4	8	16	38	35.7
Vegetation Cover by Weedy Species	22	0	8	0	0	6	2	10	4	4	10	22	26	30	12	10.4
Total Vegetation Cover	56	62	44	30	48	46	68	44	34	44	60	26	34	46	50	46.1
Litter	10	24	18	16	34	28	20	24	26	32	32	30	28	22	28	24.8
Rock						4		2	6			14	6			2.1
Bare Soil	34	14	38	54	18	22	12	30	34	24	8	30	32	32	22	26.9
<b>NATIVE SPECIES</b>																
<b>Warm Season Perennial Grasses</b>																
<i>Andropogon hallii</i>					2	<1										0.1
<i>Bothriochloa laguroides</i>							<1		<1							<1
<i>Bouteloua curtipendula</i>	2	10	20	6	8	2	8	8	12	16	10	<1	<1	<1	10	7.5
<i>Chondrosum gracile</i>	4	6	2	8		12	12	2	2	6	4	<1	<1	4	10	4.8
<i>Panicum sp.</i>								<1								<1
<i>Panicum virgatum</i>					<1	<1	<1	<1			2					0.1
<i>Pleuraphis jamesii</i>	2	10	<1	4	10	8	4	10	4	4	6				6	4.5
<i>Schedonnardus paniculatus</i>						2	2	<1					<1		2	0.4
<i>Sporobolus airoides</i>	22	14	<1	2	12	12	36	8	4	14	4	2	8	<1	2	9.3
<i>Sporobolus cryptandrus</i>	4	12	<1	4		2	<1	<1	4		20			4	<1	3.3
Sub-total	34	52	22	24	32	38	62	28	26	40	46	2	8	8	30	30.1
<b>Cool Season Perennial Grasses</b>																
<i>Agropyron dasystachyum</i>			<1													<1
<i>Carex sp.</i>								<1			<1					<1
<i>Elymus elymoides</i>		<1	<1	<1	<1	<1			<1	<1	<1		<1	2	<1	0.1
<i>Pascopyrum smithii</i>		4	12	4	10	2		6			<1	<1	<1	6	4	3.2
Sub-total		4	12	4	10	2		6	<1	<1	<1	<1	<1	8	4	3.3

Appendix Table A-14. (Continued) Transect sampling data for Soil Group E – Razor Series. Values in percent. September 2-4, 2014.

SOIL GROUP E: RAZOR SERIES	Transect Number															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<b>Perennial Forbs</b>																
<i>Astragalus bisulcatus</i>					6				<1	<1						0.4
<i>Astragalus sp.</i>											<1					<1
<i>Erigeron divergens</i>		2						<1			<1		<1			0.1
<i>Gaillardia aristata</i>															<1	<1
<i>Glandularia bipinnatifida</i>		2	<1	<1	<1	<1	2	<1	<1	<1	2		<1	<1		0.4
<i>Lesquerella sp.</i>															<1	<1
<i>Machaeranthera bigloevii</i>	<1	2		<1		<1			<1		<1					0.1
<i>Machaeranthera pinnatifida</i>															<1	<1
<i>Oligosporus dracunculus</i>												<1			4	0.3
<i>Physalis virginiana</i>											<1					<1
<i>Picradeniopsis oppositifolia</i>		<1	<1									<1			<1	<1
<i>Solidago canadensis</i>							<1									<1
<i>Sphaeralcea angustifolia</i>	<1	<1				<1	2	<1	<1							0.1
<i>Sphaeralcea coccinea</i>		<1	2	<1	<1	<1	<1	<1	<1	<1	2		<1	<1		0.3
<i>Vicia americana</i>			<1													<1
Sub-total	<1	6	2	<1	6	<1	4	<1	<1	<1	4	<1	<1	<1	4	1.7
<b>Annual Forbs</b>																
<i>Conyza coulteri</i>		<1			<1			<1			<1		<1	<1	<1	<1
<i>Dyssodia aurea</i>	<1	<1		2	<1	<1	<1	<1	4		<1					0.4
<i>Dyssodia papposa</i>						<1	<1	<1	<1			2	<1			0.1
<i>Quincula lobata</i>		<1	<1		<1	<1	<1	<1			<1					<1
Sub-total	<1	<1	<1	2	<1	<1	<1	<1	4	0	<1	2	<1	<1	<1	0.5
<b>Shrubs</b>																
<i>Atriplex canescens</i>	<1				<1			<1		<1		<1		<1		<1
Sub-total	<1				<1			<1		<1		<1		<1		<1

Appendix Table A-14. (Continued) Transect sampling data for Soil Group E – Razor Series. Values in percent. September 2-4, 2014.

SOIL GROUP E: RAZOR SERIES	Transect Number															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<b>Cacti</b>																
<i>Cylindropuntia imbricata</i>	<1					<1	<1		<1		<1					
<i>Opuntia polyacantha</i>									<1							<1
Sub-total	<1				<1	<1	<1	<1	<1		<1					<1
<b>Agavoids</b>																
<i>Yucca glauca</i>															<1	<1
Sub-total															<1	<1
<b>NON-NATIVE SPECIES</b>																
<b>Warm Season Perennial Grasses</b>																
<i>Bothriochloa ischaemum</i>										<1	<1					<1
Sub-total										<1	<1					<1
<b>Annual Grasses</b>																
<i>Bromus japonicus</i>			<1				<1	<1								
<i>Chloris verticillata</i>											<1					<1
<i>Digitaria sanguinalis</i>											<1					<1
<i>Setaria viridis</i>						<1					<1					<1
Sub-total			<1			<1	<1	<1			<1					<1
<b>Perennial Forbs</b>																
<i>Breea arvensis</i>											<1					<1
<i>Rumex crispus</i>			<1													<1
<i>Taraxacum officinale</i>															<1	<1
<i>Trifolium pratense</i>			<1													<1
Sub-total			<1								<1				<1	<1

Appendix Table A-14. (Continued) Transect sampling data for Soil Group E – Razor Series. Values in percent. September 2-4, 2014.

SOIL GROUP E: RAZOR SERIES	Transect Number															Mean
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<b>Annual Forbs</b>																
<i>Bassia sieversiana</i>				<1		<1	2	4				20	2		4	2.1
<i>Chenopodium sp.</i>		<1		<1			<1		<1				<1			0.0
<i>Conyza canadensis</i>		<1			<1		<1	<1			<1				<1	<1
<i>Euphorbia sp.</i>						<1										<1
<i>Halogeton glomeratus</i>						<1										<1
<i>Helianthus annuus</i>	<1			<1												<1
<i>Lepidium sp.</i>													<1		2	0.1
<i>Melilotus officinalis</i>			<1		<1											0.0
<i>Salsola australis</i>	14		4					2	2		4					1.7
<i>Salsola collina</i>	8	<1	4	<1	<1	6	<1	4	2	4	6	2	24	30	6	6.4
<i>Verbena bracteata</i>								<1			<1	<1				<1
<i>Ximenesia encelioides</i>	<1	<1	<1						<1	<1		<1		<1		<1
Sub-total	22	<1	8	<1	<1	6	2	10	4	4	10	22	26	30	12	10.4
<b>Shrubs</b>																
<i>Tamarix ramosissima</i>					<1											<1
Sub-total					<1											<1

## APPENDIX B

# VEGETATION CHANGES AT ESTABLISHED

## PHOTO POINTS

April 2013 – September 2014

This section includes series of photographs taken at the same locations along the S3 Section of the SDS water line route in Pueblo County. Not all of the photo points were established at the outset of the field work. Some were added as appropriate as new points of interest developed along the route. Not all of the photo points were visited in September 2013 because of inclement weather.

PHOTO LOCATION 1 - N38° 24' 38.6"; W104° 41' 23.9" - Looking North



Southern end of the S3 section of the SDS pipeline. April 30, 2013.



Southern end of the S3 section of the SDS pipeline. July 24, 2013.



PHOTO LOCATION 1 - N38° 24' 38.6"; W104° 41' 23.9" - Looking North



Southern end of the S3 section of the SDS pipeline. September 12, 2013



Southern end of the S3 section of the SDS pipeline. April 29, 2014.



PHOTO LOCATION 1 - N38° 24' 38.6"; W104° 41' 23.9" - Looking North



Southern end of the S3 section of the SDS pipeline. July 22, 2014.



Southern end of the S3 section of the SDS pipeline. September 2, 2014.



PHOTO LOCATION 2 - N38° 25' 13.5"; W104° 41' 25.1" - Looking Southeast



Small drainage with erosion control netting near Southern end of the S3 section of the SDS pipeline.  
April 30, 2013.



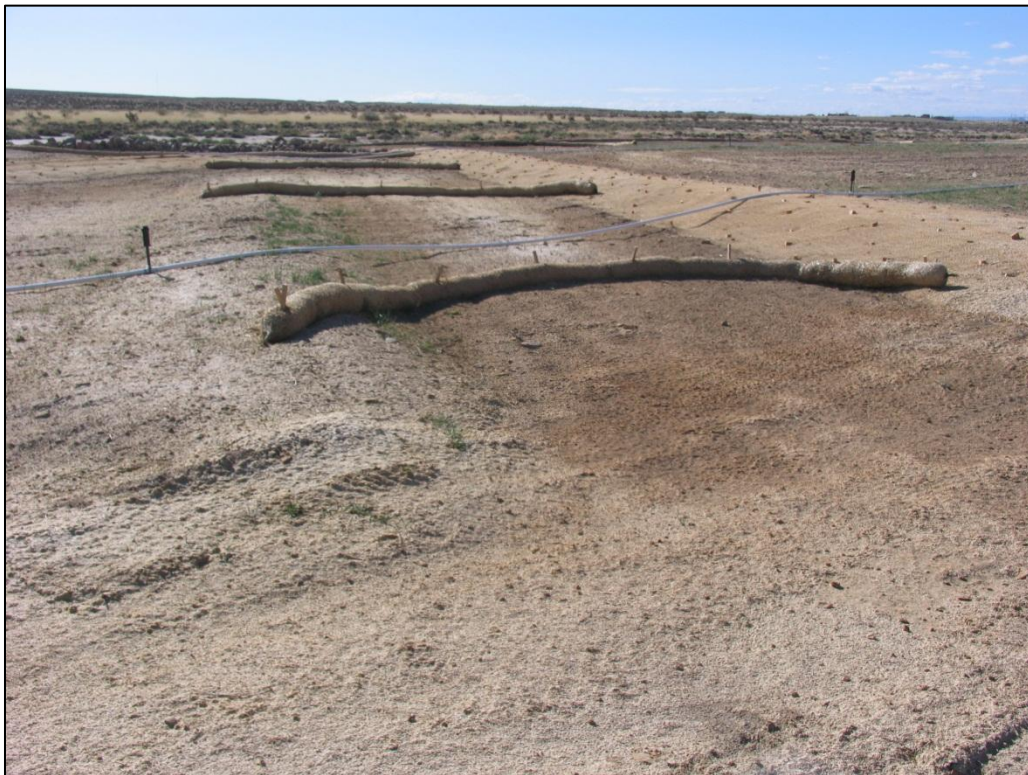
Small drainage with erosion control netting near Southern end of the S3 section of the SDS pipeline.  
July 24, 2013.



PHOTO LOCATION 2 - N38° 25' 13.5"; W104° 41' 25.1" - Looking Southeast



Small drainage with erosion control netting near Southern end of the S3 section of the SDS pipeline.  
September 12, 2013.



Small drainage with erosion control netting near Southern end of the S3 section of the SDS pipeline.  
April 29, 2014.



PHOTO LOCATION 2 - N38° 25' 13.5"; W104° 41' 25.1" - Looking Southeast



Small drainage with erosion control netting near Southern end of the S3 section of the SDS pipeline.  
July 22, 2014.



Small drainage with erosion control netting near Southern end of the S3 section of the SDS pipeline.  
September 2, 2014.



PHOTO LOCATION 3 - N38° 26' 15.3"; W104° 41' 24.3" - Looking North



Rip-Rap drainage channel installed in early 2014 in Southern Part of S3 section of the SDS pipeline.  
April 29, 2014.



Rip-Rap drainage channel installed in early 2014 in Southern Part of S3 section of the SDS pipeline.  
July 22, 2014.

PHOTO LOCATION 3 - N38° 26' 15.3"; W104° 41' 24.3" - Looking North



Rip-Rap drainage channel installed in early 2014 in Southern Part of S3 section of the SDS pipeline.  
September 2, 2014.



PHOTO LOCATION 4 - N38° 26' 54.8"; W104° 41' 24.6" - Looking South



Central part of the S3 section of the SDS pipeline (looking south). April 30, 2013.



Central part of the S3 section of the SDS pipeline (looking south). July 24, 2013.



PHOTO LOCATION 4 - N38° 26' 54.8"; W104° 41' 24.6" - Looking South



Central part of the S3 section of the SDS pipeline (looking south). April 29, 2014.



Central part of the S3 section of the SDS pipeline (looking south). July 22, 2014.



PHOTO LOCATION 4 - N38° 26' 54.8"; W104° 41' 24.6" - Looking South



Central part of the S3 section of the SDS pipeline (looking south). September 2, 2014.

PHOTO LOCATION 5 - N38° 26' 54.8"; W104° 41' 24.6" - Looking North



Central part of the S3 section of the SDS pipeline (looking north). April 30, 2013.



Central part of the S3 section of the SDS pipeline (looking north). July 24, 2013.



PHOTO LOCATION 5 - N38° 26' 54.8"; W104° 41' 24.6" - Looking North



Central part of the S3 section of the SDS pipeline (looking north).  
Photo taken near the location shown above. September 12, 2013.



Central part of the S3 section of the SDS pipeline (looking north).  
April 29, 2014.



PHOTO LOCATION 5 - N38° 26' 54.8"; W104° 41' 24.6" - Looking North



Central part of the S3 section of the SDS pipeline (looking north).  
July 22, 2014.



Central part of the S3 section of the SDS pipeline (looking north).  
September 2, 2014.



PHOTO LOCATION 6 - N38° 27' 38.2"; W104° 41' 24.5" - Looking South



Sparse vegetation development on the Midway Shale Complex; Shingle Series (Soil Group D).  
April 29, 2014.



Sparse vegetation development on the Midway Shale Complex; Shingle Series (Soil Group D).  
July 22, 2014.

PHOTO LOCATION 6 - N38° 27' 38.2"; W104° 41' 24.5" - Looking South



Sparse vegetation development on the Midway Shale Complex; Shingle Series (Soil Group D).  
September 2, 2014.



PHOTO LOCATION 7 - N38° 28' 11.2"; W104° 41' 24.9" - Looking Southeast  
Steel Hollow Crossing



Erosion control netting installed at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking southeast). April 30, 2013.



Erosion control netting installed at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking southeast). July 24, 2013.



PHOTO LOCATION 7 - N38° 28' 11.2"; W104° 41' 24.9" - Looking Southeast  
Steel Hollow Crossing



Vegetation growth on erosion control netting installed at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking southeast). September 12, 2013.



Vegetation growth on erosion control netting installed at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking southeast). April 30, 2014.



PHOTO LOCATION 7 - N38° 28' 11.2"; W104° 41' 24.9" - Looking Southeast  
Steel Hollow Crossing



Vegetation growth on erosion control netting installed at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking southeast). July 22, 2014.



Vegetation growth on erosion control netting installed at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking southeast). September 2, 2014.



PHOTO LOCATION 8 - N38° 28' 11.2"; W104° 41' 24.9" - Looking Northwest  
2014 Erosion Netting Installation at Steel Hollow Crossing



Vegetation growth on erosion control netting installed in 2014 at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking northwest). April 30, 2014.



Vegetation growth on erosion control netting installed in 2014 at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking northwest). July 22, 2014.



PHOTO LOCATION 8 - N38° 28' 11.2"; W104° 41' 24.9" - Looking Northwest  
2014 Erosion Netting Installation at Steel Hollow Crossing



Vegetation growth on erosion control netting installed in 2014 at the Steel Hollow Crossing point along the S3 section of the SDS pipeline (looking northwest). September 2, 2014.

PHOTO LOCATION 9 - N38° 29' 04.2"; W104° 41' 24.5" - Looking South



Northern Portion of the S3 section of the SDS pipeline  
South of Antelope Road (Looking South). April 30, 2013.



Northern Portion of the S3 section of the SDS pipeline  
South of Antelope Road (Looking South). July 24, 2013.



PHOTO LOCATION 9 - N38° 29' 04.2"; W104° 41' 24.5" - Looking South



Northern Portion of the S3 section of the SDS pipeline  
South of Antelope Road (Looking South). September 12, 2013.



Northern Portion of the S3 section of the SDS pipeline  
South of Antelope Road (Looking South). April 30, 2014.



PHOTO LOCATION 9 - N38° 29' 04.2"; W104° 41' 24.5" - Looking South



Northern Portion of the S3 section of the SDS pipeline  
South of Antelope Road (Looking South). July 22, 2014.



Northern Portion of the S3 section of the SDS pipeline  
South of Antelope Road (Looking South). September 2, 2014.



PHOTO LOCATION 10 - N38° 29' 40.1"; W104° 41' 25.9" - Looking Southeast



2014 Erosion Control fabric installation along northern Portion of the S3 section of the SDS pipeline South of Antelope Road (Looking Southeast). April 30, 2014.



2014 Erosion Control fabric installation along northern Portion of the S3 section of the SDS pipeline South of Antelope Road (Looking Southeast). July 22, 2014.

PHOTO LOCATION 10 - N38° 29' 40.1"; W104° 41' 25.9" - Looking Southeast



2014 Erosion Control fabric installation along northern Portion of the S3 section of the SDS pipeline South of Antelope Road (Looking Southeast). September 2, 2014.



PHOTO LOCATION 11 - N38° 29' 25.3"; W104° 41' 25.8" –  
Staging Area -Looking Southeast



Staging Area South of Antelope Road (Looking Southeast). September 12, 2013.



Staging Area South of Antelope Road (Looking Southeast). April 30, 2014.



PHOTO LOCATION 11 - N38° 29' 25.3"; W104° 41' 25.8" –  
Staging Area -Looking Southeast



Staging Area South of Antelope Road (Looking Southeast). July 22, 2014.



Staging Area South of Antelope Road (Looking Southeast). September 2, 2014.



PHOTO LOCATION 12 - N38° 29' 51.2"; W104° 41' 19.6" - Looking South



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking south). April 30, 2013.



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking south). July 25, 2013.



PHOTO LOCATION 12 - N38° 29' 51.2"; W104° 41' 19.6" - Looking South



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking south). April 29, 2014.



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking south). July 22, 2014.

PHOTO LOCATION 12 - N38° 29' 51.2"; W104° 41' 19.6" - Looking South



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking south). September 2, 2014.



PHOTO LOCATION 13 - N38° 29' 51.2"; W104° 41' 19.6" - Looking North



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking north). April 30, 2013.



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking north). July 25, 2013.



PHOTO LOCATION 13 - N38° 29' 51.2"; W104° 41' 19.6" - Looking North



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking north). April 29, 2014.



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking north). July 22, 2014.

PHOTO LOCATION 13 - N38° 29' 51.2"; W104° 41' 19.6" - Looking North



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group A – Penrose) (looking north). September 2, 2014.



PHOTO LOCATION 14 - N38° 31' 00.9"; W104° 41' 20.7" - Looking South



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group E – Razor) (looking south). April 30, 2013.



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group E – Razor) (looking south). July 25, 2013.



PHOTO LOCATION 14 - N38° 31' 00.9"; W104° 41' 20.7" - Looking South



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group E – Razor) (looking south). April 29, 2014.



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group E – Razor) (looking south). July 22, 2014.

PHOTO LOCATION 14 - N38° 31' 00.9"; W104° 41' 20.7" - Looking South



Segment of the S3 section of the SDS pipeline north of Antelope Road (Soil Group E – Razor)  
(looking south). September 2, 2014.



PHOTO LOCATION 15 - N38° 31' 09.4"; W104° 41' 17.7" - Looking North



Northern Segment of the S3 section of the SDS pipeline near the Pueblo County Line (Soil Group E – Razor) seeded in early 2014 (looking north). April 29, 2014.



Northern Segment of the S3 section of the SDS pipeline near the Pueblo County Line (Soil Group E – Razor) seeded in early 2014 (looking north). July 22, 2014.



PHOTO LOCATION 15 - N38° 31' 09.4"; W104° 41' 17.7" - Looking North



Northern Segment of the S3 section of the SDS pipeline near the Pueblo County Line (Soil Group E – Razor) seeded in early 2014 (looking north). September 2, 2014.

PHOTO LOCATION 16 - N38° 29'26.0"; W104° 41' 19.1" - Looking North



Segment of the S3 section of the SDS pipeline just north of Antelope Road  
(Soil Group C – Stoneham and Cascajo Series - looking north). September 12, 2013.



Segment of the S3 section of the SDS pipeline just north of Antelope Road  
(Soil Group C – Stoneham and Cascajo Series - looking north). April 29, 2014.



PHOTO LOCATION 16 - N38° 29'26.0"; W104° 41' 19.1" - Looking North



Segment of the S3 section of the SDS pipeline just north of Antelope Road  
(Soil Group C – Stoneham and Cascajo Series - looking north). July 22, 2014.



Segment of the S3 section of the SDS pipeline just north of Antelope Road  
(Soil Group C – Stoneham and Cascajo Series - looking north). September 2, 2014.

## APPENDIX C

### VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

September 2-4, 2014

This section presents photographs of each of the transects sampled in September 2014. Photographs were also taken of the adjacent native areas along the east and west sides of the pipeline route at the locations where the transects were sampled.



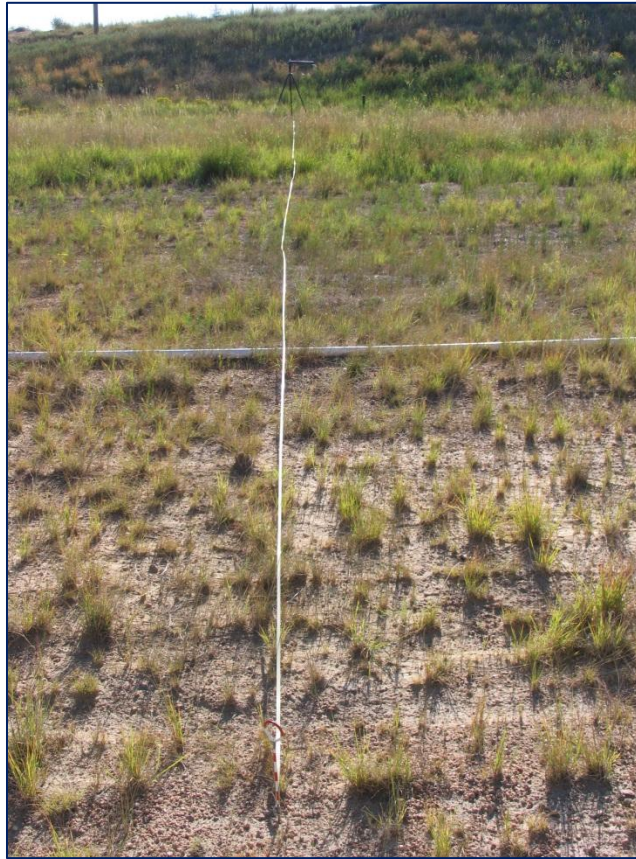
## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group A - Penrose, Manvel and Minnequa Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 1 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group A - Penrose, Manvel and Minnequa Series  
Transect 1 - N38° 29' 44.4"; W104° 41' 19.7  
Looking East  
September 3, 2014

Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group A - Penrose, Manvel and Minnequa Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 2 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group A - Penrose, Manvel and Minnequa Series  
Transect 2 - N38° 29' 54.0"; W104° 41' 19.0  
Looking Northwest  
September 3, 2014

Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 1 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 1 - N38° 24' 42.3"; W104° 41' 24.5"  
Looking East  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 1 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 2 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 2 - N38° 24' 52.0"; W104° 41' 24.2"  
Looking Southwest  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 2 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 3 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 3 - N38° 25' 8.2"; W104° 41' 24.1"  
Looking South  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 3 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 4 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 4 - N38° 25' 11.6"; W104° 41' 24.7"  
Looking North  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 4 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 5 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 5 - N38° 25' 21.0"; W104° 41' 24.5"  
Looking Northeast  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 5 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 6 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 6 - N38° 25' 28.6"; W104° 41' 24.5"  
Looking Southeast  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 6 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 7 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 7 - N38° 25' 33.4"; W104° 41' 24.7"  
Looking Northeast  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 7 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 8 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 8 - N38° 25' 42.2"; W104° 41' 24.9"  
Looking East  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 8 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 9 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 9 - N38° 25' 44.8"; W104° 41' 24.1"  
Looking Southwest  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 9 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 10 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 10 - N38° 25' 52.6"; W104° 41' 24.5"  
Looking Southeast  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 10 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 11 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 11 - N38° 26' 2.6"; W104° 41' 24.9"  
Looking Southeast  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 11 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 12 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 12 - N38° 26' 7.2"; W104° 41' 24.2"  
Looking Southeast  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 12 Location  
Looking East  
September 2, 2014

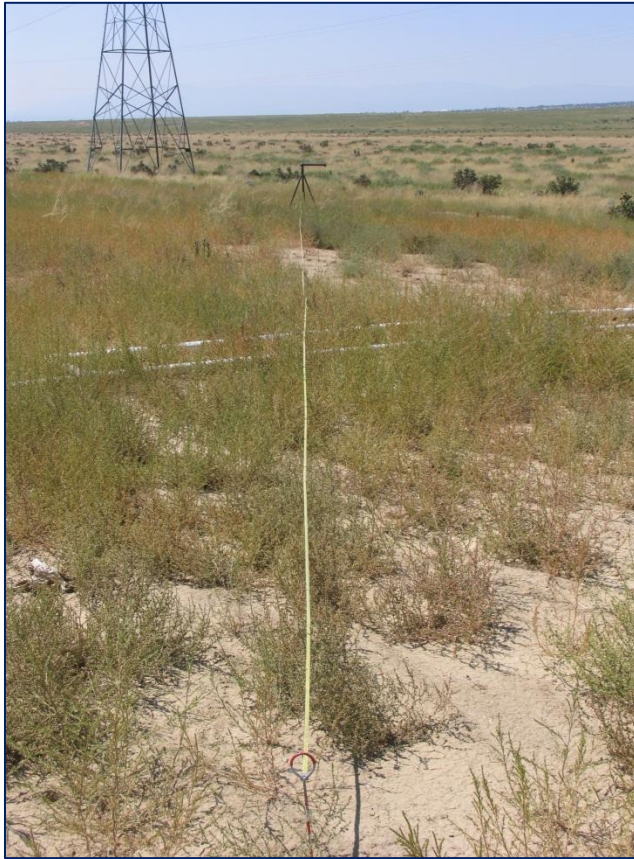


## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Transect Photograph



Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 13 Location  
Looking West  
September 2, 2014

Soil Group B – Limon and Heldt  
Transect 13 - N38° 26' 13.4"; W104° 41' 24.5"  
Looking Southwest  
September 2, 2014

Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 13 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



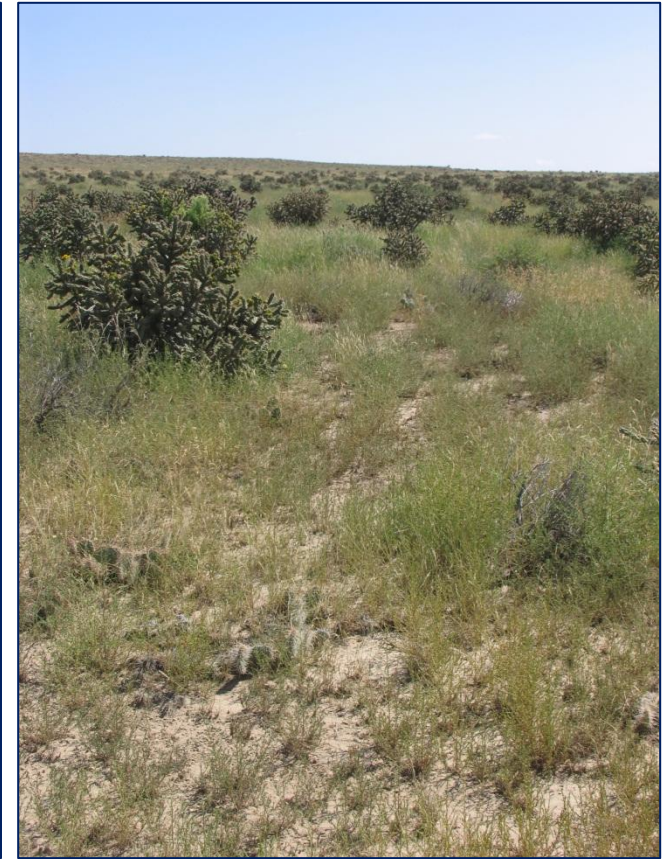
Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 14 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 14 - N38° 26' 22.2"; W104° 41' 24.1"  
Looking West  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 14 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on West Side of Right-of-Way at  
Transect 15 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group B – Limon and Heldt  
Transect 15 - N38° 27' 5.7"; W104° 41' 25.2"  
Looking Southeast  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group B – Limon and Heldt  
Native Vegetation on East Side of Right-of-Way at  
Transect 15 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



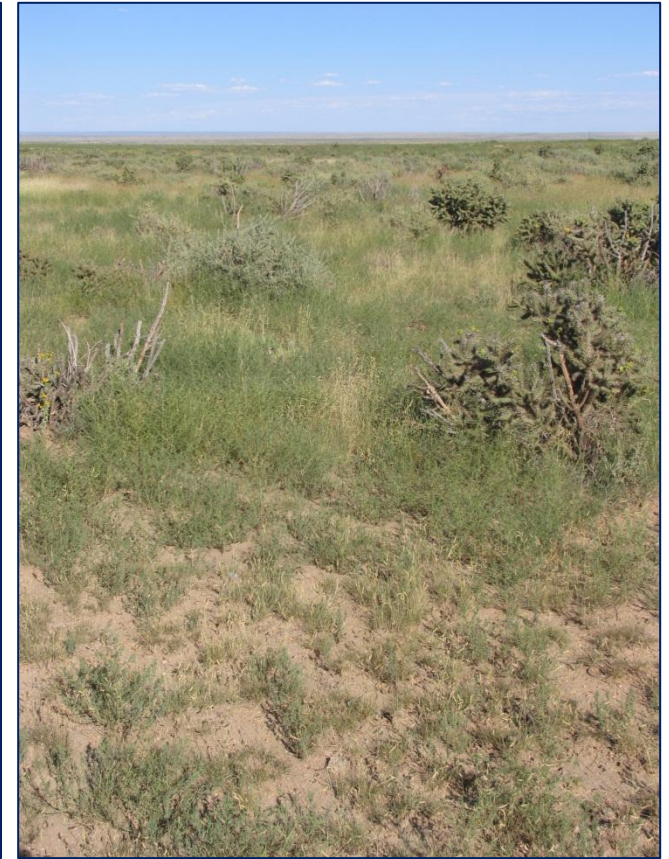
Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 1 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group C – Stoneham and Cascajo Series  
Transect 1 - N38° 29' 11.2"; W104° 41' 24.6"  
Looking Southwest  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 1 Location  
Looking East  
September 3, 2014



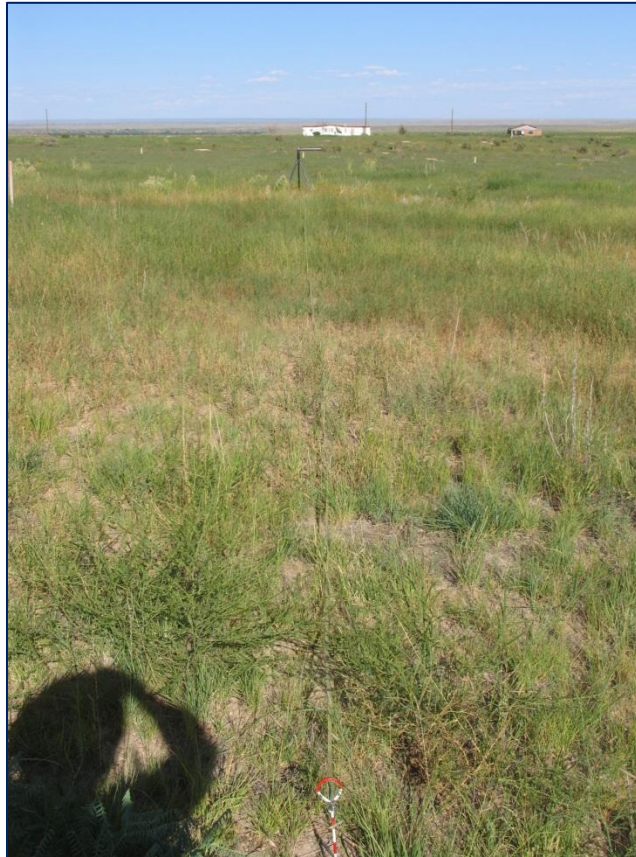
## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW

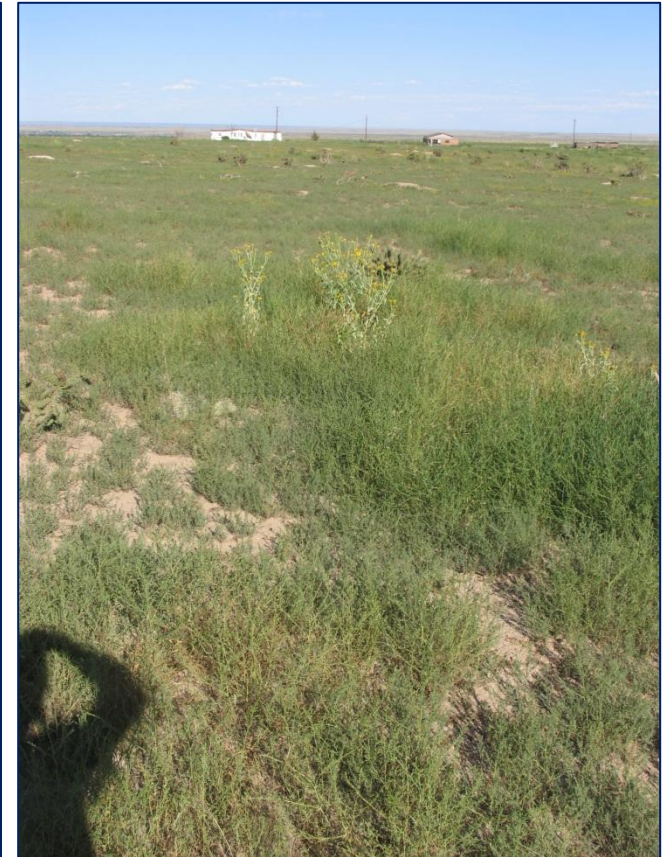
Transect Photograph

Native Vegetation on East Side of ROW

No Photograph taken on West Side  
West Side is the Staging Area south of Antelope Road



Soil Group C – Stoneham and Cascajo Series  
Transect 2 - N38° 29' 20.0"; W104° 41' 21.0"  
Looking East  
September 3, 2014



Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 2 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW

Transect Photograph

Native Vegetation on East Side of ROW

No Photograph taken on West Side  
West Side is the Staging Area south of Antelope Road



Soil Group C – Stoneham and Cascajo Series  
Transect 3 - N38° 29' 23.6"; W104° 41' 18.3"  
Looking Northwest  
September 3, 2014



Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 3 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 4 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group C – Stoneham and Cascajo Series  
Transect 4 - N38° 29' 38.4"; W104° 41' 19.5"  
Looking East  
September 3, 2014

Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 5 Location  
Looking West  
September 4, 2014

Transect Photograph



Soil Group C – Stoneham and Cascajo Series  
Transect 5 - N38° 30' 10.2"; W104° 41' 18.6"  
Looking Southwest  
September 4, 2014

Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road

## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 6 Location  
Looking West  
September 4, 2014

Transect Photograph



Soil Group C – Stoneham and Cascajo Series  
Transect 6 - N38° 30' 18.8"; W104° 41' 19.3"  
Looking Southwest  
September 4, 2014

Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 7 Location  
Looking West  
September 4, 2014

Transect Photograph



Soil Group C – Stoneham and Cascajo Series  
Transect 7 - N38° 30' 23.0"; W104° 41' 20.5"  
Looking South  
September 4, 2014

Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road



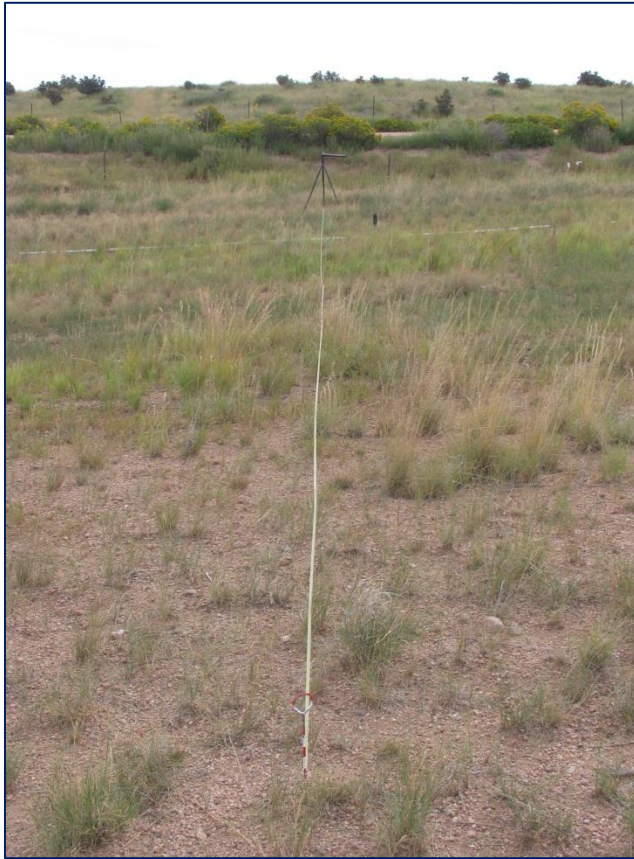
## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group C – Stoneham and Cascajo Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 8 Location  
Looking West  
September 4, 2014

Transect Photograph



Soil Group C – Stoneham and Cascajo Series  
Transect 8 - N38° 30' 26.4"; W104° 41' 20.8"  
Looking East  
September 4, 2014

Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road

## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW

Transect Photograph

Native Vegetation on East Side of ROW

No Photograph Taken on West Side

No Photograph Taken on East Side



Soil Group C – Stoneham and Cascajo Series

**Antelope Road Staging Area**

Transect 1 - N38° 29' 23.6"; W104° 41' 20.9"

Looking Northwest

September 4, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW

Transect Photograph

Native Vegetation on East Side of ROW

No Photograph Taken on West Side

No Photograph Taken on East Side



Soil Group C – Stoneham and Cascajo Series

**Antelope Road Staging Area**

Transect 2 - N38° 29' 21.6"; W104° 41' 22.9"

Looking East

September 4, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Transect Photograph



Native Vegetation on East Side of ROW

No Photograph Taken on East Side

Soil Group C – Stoneham and Cascajo Series  
**Antelope Road Staging Area**  
Native Vegetation on West Side of Staging Area  
Looking West  
September 4, 2014

Soil Group C – Stoneham and Cascajo Series  
**Antelope Road Staging Area**  
Transect 3 - N38° 29' 23.8"; W104° 41' 24.4"  
Looking Northwest  
September 4, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group D – Midway Shale Complex; Shingle Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 1 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group D – Midway Shale Complex; Shingle Series  
Transect 1 - N38° 26' 49.1"; W104° 41' 23.7"  
Looking West  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group D – Midway Shale Complex; Shingle Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 1 Location  
Looking East  
September 2, 2014

## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW

Transect Photograph

Native Vegetation on East Side of ROW

No Photograph Taken of Vegetation on West Side



No Photograph Taken of Vegetation on East Side

Soil Group D – Midway Shale Complex; Shingle Series  
Transect 2 - N38° 26' 56.9"; W104° 41' 23.8"  
Looking Southwest  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group D – Midway Shale Complex; Shingle Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 3 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group D – Midway Shale Complex; Shingle Series  
Transect 3 - N38° 27' 31.7"; W104° 41' 24.2"  
Looking West  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group D – Midway Shale Complex; Shingle Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 3 Location  
Looking East  
September 3, 2014



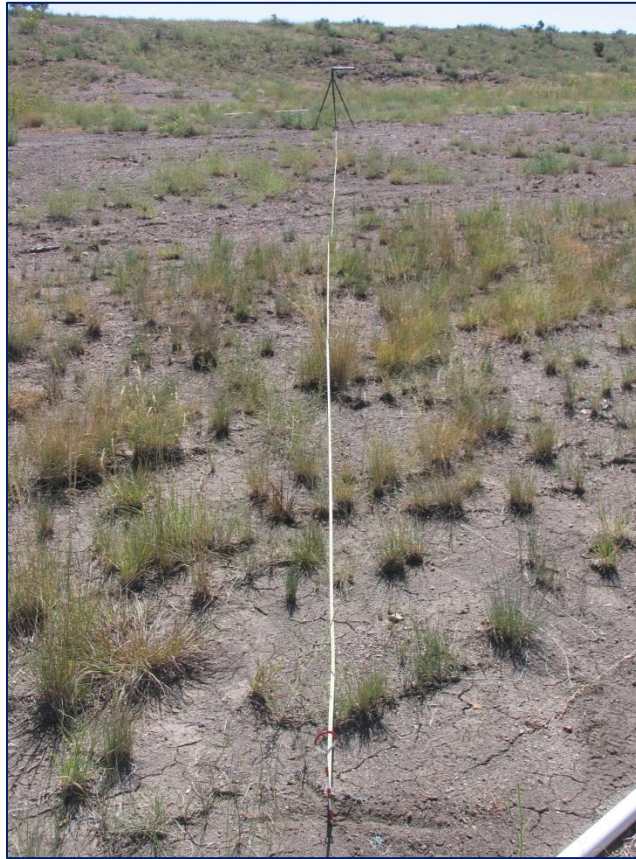
## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



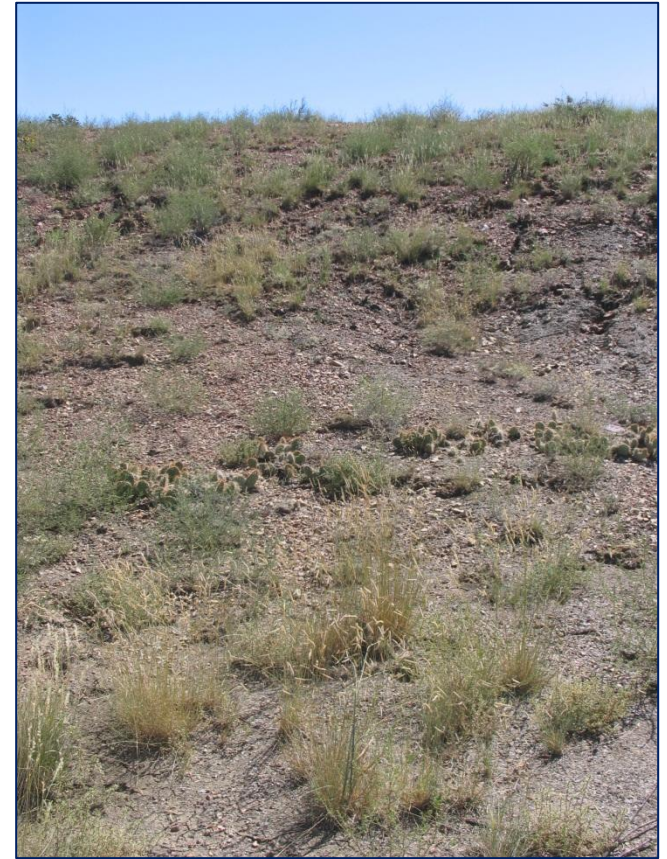
Soil Group D – Midway Shale Complex; Shingle Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 4 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group D – Midway Shale Complex; Shingle Series  
Transect 4 - N38° 27' 37.1"; W104° 41' 25.2"  
Looking Southeast  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group D – Midway Shale Complex; Shingle Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 4 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group D – Midway Shale Complex; Shingle Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 5 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group D – Midway Shale Complex; Shingle Series  
Transect 5 - N38° 27' 55.2"; W104° 41' 24.9"  
Looking North  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group D – Midway Shale Complex; Shingle Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 5 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 1 Location  
Looking West  
September 2, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 1 - N38° 26' 41.8"; W104° 41' 24.4"  
Looking North  
September 2, 2014

Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 1 Location  
Looking East  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW

Transect Photograph

Native Vegetation on East Side of ROW

No Photograph Taken of Vegetation on West Side



No Photograph Taken of Vegetation on East Side

Soil Group E – Razor Series  
Transect 2 - N38° 27' 15.9"; W104° 41' 24.6"  
Looking Northeast  
September 2, 2014

## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW

Transect Photograph

Native Vegetation on East Side of ROW

No Photograph Taken of Vegetation on West Side



No Photograph Taken of Vegetation on East Side

Soil Group E – Razor Series  
Transect 3 - N38° 27' 24.2"; W104° 41' 25.0"  
Looking South  
September 2, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 4 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 4 - N38° 27' 46.9"; W104° 41' 25.0"  
Looking Northeast  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 4 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 5 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 5 - N38° 28' 15.2"; W104° 41' 24.3"  
Looking Southeast  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 5 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 6 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 6 - N38° 28' 24.4"; W104° 41' 25.1"  
Looking Southeast  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 6 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 7 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 7 - N38° 28' 29.6"; W104° 41' 25.0"  
Looking North  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 7 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 8 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 8 - N38° 28' 36.8"; W104° 41' 25.2"  
Looking Southeast  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 8 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Transect Photograph



Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 9 Location  
Looking West  
September 3, 2014

Soil Group E – Razor Series  
Transect 9 - N38° 28' 42.4"; W104° 41' 24.9"  
Looking East  
September 3, 2014

Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 9 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 10 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 10 - N38° 28' 50.8"; W104° 41' 25.2"  
Looking South  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 10 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 11 Location  
Looking West  
September 3, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 11 - N38° 28' 59.2"; W104° 41' 24.5"  
Looking South  
September 3, 2014

Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 11 Location  
Looking East  
September 3, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Transect Photograph



Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road

Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 12 Location  
Looking West  
September 4, 2014

Soil Group E – Razor Series  
Transect 12 - N38° 30' 39.1"; W104° 41' 20.6"  
Looking Northwest  
September 4, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Transect Photograph



Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road

Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 13 Location  
Looking West  
September 4, 2014

Soil Group E – Razor Series  
Transect 13 - N38° 30' 54.5"; W104° 41' 21.2"  
Looking East  
September 4, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Transect Photograph



Native Vegetation on East Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 14 Location  
Looking West  
September 4, 2014

Soil Group E – Razor Series  
Transect 14 - N38° 31' 00.6"; W104° 41' 20.3"  
Looking Southwest  
September 4, 2014

Soil Group E – Razor Series  
Native Vegetation on East Side of Right-of-Way at  
Transect 14 Location  
Looking East  
September 4, 2014



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Soil Group E – Razor Series  
Native Vegetation on West Side of Right-of-Way at  
Transect 15 Location  
Looking West  
September 4, 2014

Transect Photograph



Soil Group E – Razor Series  
Transect 15 - N38° 31' 05.5"; W104° 41' 19.8"  
Looking West  
September 4, 2014

Native Vegetation on East Side of ROW

No Photograph Taken on East Side  
East Side is a gravel road



## VEGETATION TRANSECT PHOTOGRAPHS – S3 SECTION OF SDS WATER PIPELINE RIGHT-OF-WAY – PUEBLO COUNTY

Native Vegetation on West Side of ROW



Transect Photograph



Vegetation in Bottom of Draw



Soil Group F – Haverson Series and  
Ustic Torrifuvents

Native Vegetation on West Side of Right-of-Way at  
Transect 1 Location  
Looking West  
September 4, 2014

Soil Group F – Haverson Series and  
Ustic Torrifuvents

Transect 1 - N38° 30' 04.2"; W104° 41' 19.3"  
Looking Northeast  
September 4, 2014

Soil Group F – Haverson Series and  
Ustic Torrifuvents

Flooded Vegetation in the Bottom of the Draw at  
Transect 1 Location  
Looking East  
September 4, 2014