MEMO

To: Ms. Catherine Roy, Colorado Oil and Gas Conservation Commission (COGCC)

From: Mr. Clint Casey, SME Environmental, Inc. (SME); Ms. Lori Notor, ConocoPhillips Company (COPC)

cc: Mr. Mike Smith, COPC

Date: 7/24/2015

Re: *Final reclamation plan for Argenta 34-10 #31 1 oil and gas infrastructure and response to the COGCC field inspection.*

The purpose of this memorandum is to provide a response to the required actions that were cited during a COGCC field inspection dated March 24, 2015 and to provide additional information requested by the COGCC on June 19, 2015 for the Argenta 34-10 #31 1 oil and gas infrastructure. The field inspection report document number is 667100413.

- Detailed schedule for reclamation activities -*provided as Attachment A.*
- Methods for decompaction, gravel and equipment removal, and recontouring -*provided as Attachment B.*
- Site specific Stormwater Management Plan –*Stormwater Management Plan provided in Attachment C.*
- Site specific Weed Management Plan –*Weed Management Plan provided in Attachment D.*
- Mulch type and application rate –*specified within Weed Management Plan.*
- Seed mix, application rate (in PLS/square foot), and application method -*specified within Weed Management Plan.*
- Fertilizer, soil amendments, and water -*specified within Weed Management Plan.*

-The channel that was redirected to the south side of the access road and formed an erosional channel will be reclaimed as well as the channel in the northern portion of the project area that was diverted during grading activities. Details on stream stabilization methods and erosion prevention techniques are outlined within the attached Stormwater Management Plan. General phases and timing of best management practices (BMPs) are also outlined within this document.

-The area where the incised ditch intersects the natural wash will be reseeded by hand in a manner that will minimize disturbing any existing vegetation or more soil than necessary (Attachment C, Figure 2A/Figure 2B). This portion of the diverted wash has an average depth of 2-3 inches, with a maximum depth of 5 inches at its deepest point. This area will be considered stable after the adjacent road and associated ditch are reclamated because there will no longer be concentrated run on to cause additional erosion.

-SME mapped and flagged aquatic features in the field to assist with the placement of BMPs and to ensure that the areas outside of the identified impact zones are not disturbed during reclamation/ regrading activities.

The above-referenced attachments were initially submitted to COGCC on May 22, 2015 for review. Below are the comments provided by the COGCC concerning the reports during their review of the May 2015 submittal and the responses to these comments.

COGCC Comments and SME/ COCP Responses

1. The entire project area needs to be recontoured and reclaimed. This includes areas not proposed for reclamation in the plan such as the eastern portion of the well pad, the diverted stream channel along the northern edge of the project area and the small corner of the well pad north of the current stream channel in the northeastern corner of the project area. Please amend the report and include recontouring and reclamation of the entire project area.

The plans have been updated to recontour and reclaim the entire area and a stream restoration plan (SWMP; Figures 3 and 4) has been developed to restore the stream channel along the eastern portion of the project area.

2. In several places the word "should" is used when stating that a necessary action will be completed. The term "should" needs to be replaced with "will" in instances that the action will be completed. Please amend as appropriate.

"Should" was replaced with "will" where appropriate throughout all documents.

3. How will the stream that was diverted over the northern portion of the project area be contoured and stabilized?

This specification is addressed on page 7 of the revised Stormwater Management Plan. A stream restoration plan has been developed to restore the stream channel along the eastern portion of the project area. Details of this stream restoration plan are provided as Figure 3 and 4 of the revised Stormwater Management Plan.

4. Maps show that both waterways are considered Wetlands or Waters of the U.S. Please provide documentation as to consultation with the U.S. Army Corps of Engineers as to the regulatory status of these waterways and if permitting is required for the work, then copies of the permit documentation will be needed.

Informal correspondence between SME and the USACE has already occurred to determine the appropriate permit for this scenario. A Clean Water Act Section 404 Nationwide Permit 27 for Aquatic Habitat Restoration, Establishment and Enhancement Activities is being submitted to the USACE for approval, this permit will cover all historic impacts to WOUS as well as impacts that will occur as part of reclamation.

5. On page 8 under "Final Site Stabilization and Long term Stormwater Quality", it says that final stabilization is achieved when a uniform cover of 70 percent pre-disturbance is achieved. This should specify that this is to CDPHE standards and COGCC requires 80 percent of pre-disturbance or reference area cover to clarify the difference between the two.

This specification is addressed on page 8 and 9 of the revised Stormwater Management Plan.

"Final stabilization for CDPHE is achieved when soil disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 70% of pre-disturbance levels. Final stabilization for COGCC reclamation standards is achieved when soil disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 80% of pre-disturbance levels."

6. The report states that stormwater inspections will not be completed when there is snow cover, please indicate how it will be determined that inspections will resume so that snow melt events can be evaluated.

This is addressed in greater detail on page 9 of the revised Stormwater Management Plan.

"Inspections will not occur when snow cover exists over the entire site for an extended period. The inspector will monitor local weather patterns and terrain at similar elevations to determine if snow cover exists at the site."

7. It is unclear if the report is proposing that weeds only be treated within the area mapped as the "infestation area"? Noxious weeds were observed throughout the project area and therefore need to be controlled throughout.

This is addressed on the revised Weed Management Map and throughout the revised Weed Management Plan. If the entire site is re-contoured, then the seeding plan would apply to the entire regraded area.

8. In the event that weeds such as kochia or Russian thistle that are not noxious, but competitive with desirable vegetation become established, how will these be managed? This is necessary because aggressive weeds will often compete with desirable vegetation and impede upon achievement of the 80 percent re-vegetation goal.

This is addressed on page 7 of the revised Weed Management Plan. Multiple integrated weed management plans are defined. Seeding Methods-The seeding plan in the Weed Management Plan includes re-vegetation goals for the best outcome for establishing desirable species at the site and 80% cover of desirable species. We expect that the timing of seeding and moisture/ precipitation levels will determine, to some extent, the establishment of cover. Also, the report includes monitoring efforts that would ensure that outbreaks of noxious weed cover would be remedied (i.e. sprayed and reseeded as necessary) to achieve 80% re-vegetation.

9. Recontouring should not be completed "to the extent practicable". Recontouring needs to be completed as "close to the original contour as practicable" throughout the project area as stated in the final reclamation rules.

The reference "to the extent practicable" was only observed on the project maps and has been updated. The option to not grade the entire pad was previously discussed with the COGCC and portrayed in the previous reclamation plan; however, due to the need for additional fill material and to adhere to COGCC regulations, recontouring will be completed as "close to the original contour as practicable" throughout the project area.

10. According to the reclamation rules, decompaction should be conducted to a minimum depth of 18 inches (or to bedrock layer if shallower) as opposed to 12 inches which is proposed on page 6 of plan.

The decompaction depths were changed from 12 to 18 inches (or to bedrock layer if shallower) on the grading plan (Attachment B).

11. The proposed dryland pasture seed mix is not appropriate for this location. This location is not pasture and the dry land seed mix is largely non-native species. The Foothills Native seed mix is closer to an appropriate mix. Please amend report with appropriate seed mix and omit the inappropriate seed mix.

This is addressed on pages 6 and 7 of the revised Weed Management Plan. Seeding Methods- Foothills native seed mix is specified for this project and dryland pasture is excluded.

12. Typically, we do not recommend use of a cover crop such as Quick Guard.
Often the cover crop will rapidly establish and can out-compete desirable species. COGCC would not use this method; however, we cannot require that you do not to use this method.

Page 7 of the Weed Management Plan was revised to include the use of Quick Guard. We are listing multiple seeding and integrated weed management plans to ensure the site is seeded successfully and monitored.

13. COGCC does not separate between "enforceable" and "non-enforceable"
noxious weeds. Noxious weeds need to be controlled on the location until it passes final reclamation.

Amended – page 5 and though-out the Weed Management Plan to state that noxious weeds that dominate the site, and do not allow native cover to establish, will be controlled.

14. Monitoring of weeds and re-vegetation progress is not sufficiently described. Will it be conducted at the same time as SWMP inspections? Not clear as to frequency of SWMP inspections. Someone experienced in weed identification and vegetation assessment needs to be present to identify weed species and re-vegetation should be monitored.

Yes, the weed monitoring will coincide with the Stormwater Management Plan inspections as specified in the Stormwater Management Plan and in the Weed Management Plan. Also, a yearly site visit by a biologist during the growing season is included on Page 7 of the revised Weed Management Plan and page 9 and 10 of the revised Stormwater Management Plan.

From the revised Stormwater Management Plan- "During SWMP inspections seeded areas will be assessed for revegetation progress. Weed species will be monitored by personnel familiar with invasive species identification on an annual basis during growing season. Additionally, corrective action of deficiencies in certain BMPs or invasive species observed in the inspection will be noted and corrected."

15. Weeds need to be monitored and controlled until location passes final reclamation. The provided SWMP Inspection sheet does not identify that weeds will be monitored.

The Stormwater Management Plan inspection sheet has been revised to include onsite weed observations for cover and species and noxious weed outbreaks on site.

S:\Projects\150020 argenta stormwater

Attachment A

Argenta 34-10 31-1
Reclamation Schedule

Operations will commence on September 14, 2015.

Day 1 - Move in, construct tracking pad and pioneer road to pad with D-7 dozer & excavator. Begin setting waddles.

Day 2 – Complete waddle and silt fence installation. Close pit utilizing dozer & excavator.

Day 3 – Begin re-contouring with excavator & dozer.

Day 4 – Continue re-contouring.

Day 5 – Finish re-contouring.

Day 6 – Spread Humate soil conditioner and re-seed pad.

Day 7 – Begin road reclamation, pull culverts and install reventment mats and soil retention mats.

Day 8 – Complete road reclamation.

Day 9 – Re-seed reclaimed road.

Attachment B

Argenta 34-10 31-1
Grading Activities and Methods

This document outlines Conoco Phillips grading activities and methods.

- The method utilized to de-compact the soil involves ripping with a dozer and/or discing with a farm type tractor, decompaction will be conducted to a minimum depth of 18 inches (or to bedrock layer if shallower).

- Gravel will be scraped up & hauled out or used on another producing COP location. The operator will use a loader and dump truck.

- Re-contouring will be accomplished with a dozer, excavator, and front end loader. The operator will re-contour the location to as close to the original contour as possible.

Attachment C

STATE OF COLORADO
GENERAL PERMIT FOR DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES
STORMWATER MANAGEMENT PLAN (SWMP) FOR ARGENTA 34-10 #31-1 RECLAMATION

Prepared for:

ConocoPhillips

ConocoPhillips Company
3401 East 30 Street
Farmington, New Mexico 87402-8807

Prepared by:

SME
ENVIRONMENTAL CONSULTANTS
679 East 2nd Avenue, Unit E2
Durango, CO 81301-5563

May 2015

"*A copy of this SWMP **must be kept on-site**, for ready availability to the operator, and so that Division or EPA personnel can review it during an inspection*."

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ATTACHMENTS AND FIGURES

1. Site Description

a) Location, Size and Purpose:
The proposed project area is located approximately 8 miles southwest of the City of Durango in La Plata County, Colorado. The proposed project area is depicted on the Basin Mountain, Colo. 7.5' U.S. Geologic Survey (USGS) quadrangle map and lies within Section 31, Township 34 North, Range 10 West, NMPM (Figure 1). The proposed project area is located on private parcel # 590731400049. The construction area expected to undergo clearing, excavation and grading is approximately 2.35 acres (Figures 1 and 2). The proposed activity involves the reclamation of road and oil and gas infrastructure to pre-disturbance topography and removal of any remaining oil and gas infrastructure.

b) Construction Sequence:
The sequence for major activities at the Argenta 34-10 #31-1 Reclamation project site includes clearing, grading, cut/fill activities, stream restoration, and reseeding.

c) Nearby Potential Pollution Sources:
There are multiple well pads and oil and gas infrastructure adjacent to the project area; there was no evidence of releases of hazardous material from these sites.

d) Surface Water Drainage:
Surface water drainage from the site would flow toward La Posta Canyon and then to the Animas River.

e) Receiving Waters:
The project's receiving waters include La Posta Canyon. La Posta Canyon discharges into the Animas River approximately 4.75 miles east of the project area.

f) Soils:
According to the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey, soils found within the analysis area are comprised of the Zyme clay loam and badland component.

Approximately 85% of the project area is located on the Zyme Clay Loam component. Slopes are 3 to 25 percent. This component is found on hills and ridges. The parent material consists of residuum weathered from shale. Depth to a restrictive feature, paralithic bedrock, is 6 to 20 inches. The natural drainage class is well drained and the runoff class is very high.

Approximately 15% of the project area is located on the Badland component. Slopes are 30 to 60 percent. This component is also found on hills. The parent material consists of weathered bedrock. Depth to a restrictive feature, paralithic bedrock, is 0 to 3 inches. The natural drainage class is not defined and the runoff class is very high (Web Soil Survey, 5/8/2015).

g) Vegetation*:*
The historic vegetative community surrounding the Argenta 34-10 Unit 31-1 reclamation site is dominated by Piñon- Juniper community including Gamble's Oak (*Quercus gambelii*),

antelope bitterbrush (*Purshia tridentata*), cliff fendlerbush *(Fendlera rupicola)*, rubber rabbitbrush (*Ericameria nauseosa*), and big sage (*Artemisia tridentata*).

h) Hydrology:
The project area is located within the USGS-designated Animas Watershed (HUC: 14080104). An unnamed ephemeral/intermittent stream is located approximately 50 feet east of the well site. The perennial Animas River is located approximately 4.75 miles east of the well site. The Animas River, downstream of the project area, is listed as impaired for pathogens, nutrients, sediment, temperature, and turbidity (EPA, Hows My Waterway?, 5/8/2015).

2. Site Map

Figure 1 is an overall location map, which identifies the project boundaries. Figure 2A (phase 1) and Figure 2B (phase 2) are site specific aerial maps, which depict the approximate disturbance area and locations of best management practices (BMPs). Figure 3 is a site specific aerial map, which depicts the northern stream restoration plan and Figure 4 are the cross sections for the northern stream restoration plan.

3. Stormwater Management Controls

a) SWMP Administrator

The Stormwater Management Plan (SWMP) administrator is responsible for implementing the Argenta 34-10 #31-1 Reclamation SWMP. The SWMP administrator develops, implements, and modifies required SWMP activities (i.e. evaluations, training, BMPs). The SWMP administrator is the key point of contact for all SWMP activities. The SWMP administrator has the authority to manage day-to-day stormwater quality management activities for the proposed project.

SWMP Administrator: Ms. Lori Notor

b) Identification of Potential Pollutant Sources

Potential pollutant sources include disturbed and stored soils, and there is a potential for vehicle tracking. Both of these potential pollutants associated with the proposed project could contribute sediment to stormwater. Within the boundaries of the proposed project all stormwater will be isolated with BMPs.

c) Best Management Practices for Stormwater Pollution Prevention

i. Structural Practices for Erosion and Sediment Controls

Structural practices involve the installation of devices to divert, store or limit runoff. These practices have several objectives, including sediment and erosion control or management of runoff. BMPs are to be utilized within the project area and are depicted on the Site Map (Figure 2A, Figure 2B) and BMP Technical Drawings (Attachment A). BMPs to be implemented at the site include the following:

Silt Fences

Purpose

- Creates a physical barrier for trapping sediment laden runoff.
- Creates a physical barrier for preventing the accidental filling (or spilling) of sediment that frequently occurs with site grading activities.
- Directs site runoff to other BMPs and away from particularly sensitive areas.
- Provides a visual delineation to assist construction personal in avoiding the accidental disturbance of sensitive areas.

Location

Silt fencing will be placed as specified on BMP Technical Drawings and Site Specific BMP Maps. The silt fences will be erected as close to the work area as possible. In addition, silt fence will placed around spoil piles and disturbed soils to prevent spoils from migrating down slope and potentially entering aquatic resources.

Maintenance

1. Inspect the silt fence after storm events.
2. Repair or replace any damaged areas immediately.
3. Sediment will be removed from behind the silt fences when it accumulates half way up the filter material; removed sediment will be properly disposed of.
4. Silt fences are only effective if there are no gaps. Therefore, the fence will be standing upright and buried into the ground. Certain sections of fence may need to be periodically re-buried or re-erected, which may require new fabric, stakes and staples.

Straw or Fiber Wattles

Purpose

- Filter sediment laden runoff.
- Help reduce sheet and rill erosion.
- Can be used in place of silt fencing and are easy to install.
- Good to use in streams and wet areas for sedimentation filtration.

Location

Straw wattles will be installed as specified on BMP Technical Drawings and Site Specific BMP Maps. The wattles will be as close to the work area as possible. In the event that additional fill material is required wattle locations will be adjusted to encompass any disturbed material.

Maintenance

- Inspect the straw wattles after a storm event.
- Repair or replace any damaged areas immediately.
- Check to make sure stakes are still secure and wattles are not eroding underneath.

Check Dams

Purpose

- Slow water flows to allow suspended sediments to settle out.
- Filter sediment laden runoff.

- Prevent erosion and head-cutting in channels.
- Also used as a coffer dam when working within flowing surface waters

Location or use with other BMPs
Check dams can be made with rock, straw bales, sand bags or wattles depending on the expected flows. Check dams will be installed as specified on BMP Technical Drawings and Site Specific BMP Maps.

Installation
1. Place rock, wattles or hay bales in a channel or swale in a manner that will allow for shallow ponding.
2. Secure the dam as necessary to prevent a wash out during a large storm.
3. Install completely across the drainage.
4. Use large enough rocks or stones to prevent washouts.
5. Stack rocks, hay bales, or wattles tightly.

Maintenance
a. Periodically remove sediment build up to avoid water flowing around the sides and properly disposed of according to the SWMP.
b. Repair or replace rocks or stones as needed.
c. Potential to reuse the rip-rap at the construction site.

Soil Retention Blanket

Purpose
- To control erosion and retain sediment resulting from sheet flow runoff.
- Protect newly seeded areas.

Location or use with other BMPs
Soil retention blankets will be used within the disturbed area of the adjacent banks to the washes where the culverts will be removed and will be installed after construction is complete. Soil retention blankets will be installed as specified on BMP Technical Drawings and Site Specific BMP Maps.

Installation
1. Lay in blankets similar to roof shingles; start at the lowest part of the slope, then work your way up. Uphill pieces overlap downhill sections.
2. Secure blanket as necessary to prevent a wash out during a large storm.
3. Do not stretch blankets.

Maintenance
a. Re-anchor loosened matting and replace missing matting and staples as required.
b. Repair or replace blanket as needed.

Bank Armoring

Purpose

- To control erosion and prevent erosion or stream capture from large storm events.
- Provide long-term stream stability.

Location or use with other BMPs

Bank armoring will be created from rock material found on site and will be used below and above the ordinary high water mark upstream of where the northern culvert will be removed. Once the culvert is functional, the erosional feature on the south side of the road will be backfilled and the bank armoring will be installed as soon as possible to prevent the wash from eroding this bank and being channelized along the road again. Bank armoring will be installed as specified on BMP Technical Drawings and Site Specific BMP Maps.

Installation

1. Place rip rap at existing grade, in a an interlocked manner such that there is minimal space between rock that would allow flows to erode material behind rip rap; start at the lowest part of the slope, then work your way up.
2. Secure rip rap as necessary to prevent a wash out during a large storm.

Maintenance

c. Re-anchor loosened matting and replace missing matting as required.
d. Repair or replace mats as needed.

Grade Control Structure

Purpose

- To control erosion and prevent head-cutting from large storm events.
- Provide long-term stream stability.

Location or use with other BMPs

Grade control structures will be used below the ordinary high water mark and on the adjacent banks to the washes where the culverts will be removed. They will be installed after construction is complete. Grade control structures will be installed as specified on BMP Technical Drawings and Site Specific BMP Maps.

Installation

1. Lay in concrete revetment mats at existing grade, in a manner such that the top of the mats are not above the grade of the wash or banks; start at the lowest part of the slope, then work your way up. Keep the mats connected to each other to prevent stream degradation from occurring between mats.
2. Secure mats as necessary to prevent a wash out during a large storm.

Maintenance

e. Re-anchor loosened matting and replace missing matting as required.
f. Repair or replace mats as needed.

Tracking Pad

Purpose

- Remove mud and sediment from vehicles when leaving disturbed area.

Location or use with other BMPs

Tracking pad is made with rock, usually larger sized cobbles (4-6”). Tracking pad will be installed as specified on BMP Technical Drawings and Site Specific BMP Maps.

Installation

1. Place rock in a manner that will cause material to be loosened from vehicles.
2. Secure the dam as necessary to prevent a wash out during a large storm.
3. Install completely across the roadway at the entrance exit points to a minimum of 70 ft in length.
4. Install geotextile beneath course aggregate.

Secondary Containment of Above Ground Storage Tanks

Purpose

- Although no above ground storage tanks (AST) are anticipated at the site, in the event that they are needed, secondary containment will be implemented. Appropriate containment and/or diversionary structures will be installed to prevent a discharge of oil and be constructed in a manner such that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs.

Location or use with other BMPs

Secondary containment will be placed below any AST’s if applicable.

Installation

1. Place containment in a manner that will capture any material leaking from AST, containment will be secured so that it is not relocated by wind events.

ii) Non-Structural Practices for Erosion and Sediment Controls

The following non-structural BMPs will be utilized, as practical, to initiate runoff management, and improve and facilitate the management of stormwater impacts.

Vehicle and Equipment Maintenance: All vehicles left on-site will be properly maintained and serviced regularly. Vehicles will be inspected daily for leaks or signs of wear which could lead to leaks in the future.

Minimize Clearing: Minimization of clearing activities incorporates several components of BMPs for runoff control; only the existing cover will be removed where necessary for the operation of equipment or for use as fill material.

Mulching: Mulching, in conjunction with seeding, provides erosion protection prior to the onset of plant growth. In addition, mulching protects newly-applied seeds, providing a

higher likelihood of successful re-vegetation. To maintain its effectiveness, mulch will be anchored to resist wind displacement. Details pertaining to mulching and reseeding are given in the Weed Management Plan.

iii) Phased BMP Implementation

Phase 1. Silt fences, wattles and other BMPs will be installed before or during construction setup as shown in Figure 2A. As the operator brings in equipment and materials, secondary storage containment will be constructed for any ASTs. BMPs will be phased with the major sequence of events. During remediation activities, while the road is being used for access, the west culvert that was previously blocked will be made operational or replaced if necessary and the deep roadside ditch will be backfilled and armored near the culvert to redirect any flows that may occur during construction through this culvert. This armor will be sufficient enough to act as a permanent barrier to keep the swale in its original path and away from its current course along the access road once this culvert is removed and the drainage is restored. A stream channel was also previously impacted during grading activities along the northern portion of the project area. This stream segment will be restored to its previous approximate location as shown on Figure 3. The re-established stream segments are anticipated to be more stable than the current channels (Figure 4), both of which have become deeply incised and are a significant sediment source to La Posta Canyon. To confirm that the restored channels result in increased stream stability, the streams will be monitored for three years following completion of the project. Monitoring will consist of pedestrian surveys of the restored channels by a qualified restoration consultant. The general condition of the channels will be photo-documented, and any locations of instability will be photographed and noted. Significant channel instability will be addressed via adaptive management prescribed by the restoration consultant. Examples of potential adaptive management include but are not limited to additional seeding, placement of additional bank armor, and/or placement of additional grade control structures.

Phase 2. When reclamation and seeding is complete on the pad, the operator will work their way east towards the main access road, returning the existing road to pre-construction topography and seeding along the way (a detailed revegetation plan is provided in the Weed Management Plan). Existing culverts will be removed and the swale returned to pre-construction topography. The drainage will be stabilized using BMPs, grade control structures, and bank armoring as shown in Figure 2B and as specified on BMP Technical Drawings. The area where the incised ditch intersects the natural wash will be reseeded by hand in a manner that will not disturb any existing vegetation or more soil than necessary (Figure 2A/Figure 2B). Soil retention blankets and wattles will be comprised of biodegradable material and will be left in place to assist with sediment management until revegetation is complete. All other temporary BMPs, including the tracking pad, will be removed.

iv) Materials Handling and Spill Prevention Controls

Potential pollutant sources are areas in which construction activities are exposed to stormwater. The following items identify the procedure for the handling of materials that may contribute pollutants to runoff.

- Absorbent pads will be used for any leaking vehicles or generators.

- No heavy equipment will be stored in streams or open water sources including wetlands, etc.
- Contractors will not conduct fueling or lubricating of construction equipment or other motor vehicles within 100 ft of open water sources or other aquatic resource areas (including wetlands), etc.
- Major construction equipment repairs will be performed offsite, where practicable.
- Storage of chemicals, petroleum products or other hazardous materials will have secondary containment.
- Containment structures sufficiently impervious to prevent a discharge to aquatic resources, such as containment dikes, containment walls, drip pans, or equivalent protection actions, are to be constructed and maintained around all qualifying bulk oil storage facilities, including tank batteries, consistent with the U.S. Environmental Protection Agency's (EPA) Spill Prevention Control and Countermeasures (SPCC) regulation (40 CFR 112) as required.
- Spill prevention and responses are further discussed below.

Spill Prevention: A spill preventive program involves inspections and maintenance of stormwater management devices and routine inspections of facility operations to detect faulty equipment. Storage areas and equipment, such as tanks, containers, and drums, will be checked regularly for signs of deterioration. No solid materials, including floatable debris, will be stored in or near waters. Vehicle tracking, materials, and sediment, along with the generation of dust, will be minimized. Waste receptacles will be onsite and adequately maintained; sanitary facilities will be provided onsite at all times**.**

v) Dedicated Concrete or Asphalt Batch Plants

There will be no concrete or asphalt batch plants utilized on the site.

vi) Vehicle Tracking Control

A vehicle tracking pad will be implemented when the project starts to disturb soils.

vii) Waste Management and Disposal, Including Concrete Washout

Trash receptacles will be available and maintained to facilitate a sanitary work environment. If concrete is utilized at this site, a concrete washout will be implemented, where appropriate.

viii) Groundwater and Stormwater Dewatering

No groundwater or stormwater dewatering activities are to occur on the project site.

4. Final Site Stabilization and Long-term Stormwater Quality

Final stabilization will commence soon after construction activities have been completed. Final stabilization for CDPHE is achieved when soil disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 70% of

pre-disturbance levels. Final stabilization for COGCC reclamation standards is achieved when soil disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 80% of pre-disturbance levels. Mulching and seeding will take place according to the Weed Management Plan. All temporary BMPs will be removed.

The following actions will be taken to reach final stabilization.

- BMPs will remain in place until the site revegetation has been approved and erosion control is permanent.
- The disturbed area will be revegetated to help stabilize exposed soils, reduce sediment loss, reduce noxious weed growth, reduce maintenance costs, maintain scenic quality and forage, and protect habitat.

5. Inspection and Maintenance Procedures

Inspections will be conducted at least every 14 calendar days and within 24 hours of any precipitation or snowmelt event that causes surface erosion during construction activities. For completed sites that have not yet reached final stabilization criteria, reduced inspection schedules to once a month will be conducted. Inspections will not occur when snow cover exists over the entire site for an extended period. The inspector will monitor local weather patterns and terrain at similar elevations to determine if snow cover exists at the site.

Temporary and permanent erosion and sediment control BMPs will be inspected and maintained, as necessary, to assure continued performance of their intended function. Site inspections will be conducted by a knowledgeable person in the principles and practices of erosion and sediment controls. This person will possess the skills to assess conditions at the site that could impact stormwater quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the entire site. Inspection forms are located in Attachment B.

Inspection procedures:

Inspections will include all areas of the site disturbed by activity. The site inspector(s) must look for evidence of, or the potential for, pollutants entering the stormwater conveyance system. Sedimentation and erosion control measures will be observed to ensure proper operation. Discharge locations will be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to aquatic resources (wetlands, streams, ponds). Locations where vehicles enter or exit the site will be inspected for evidence of off-site sediment tracking. During SWMP inspections seeded areas will be assessed for revegetation progress. Weed species will be monitored by personnel familiar with invasive species identification on an annual basis during growing season. Additionally, corrective action of deficiencies in certain BMPs or invasive species observed in the inspection will be noted and corrected. Monitoring records will be maintained with the stormwater inspection sheets. The following would be observed during inspections:

- Construction site perimeter and discharge points including discharges into a storm sewer system.
- All disturbed areas.
- Areas used for material storage that are exposed to precipitation.
- Other areas determined to have a significant potential for stormwater pollution.
- Erosion and sediment control measures identified in the SWMP.
- Any other structural BMPs that may require maintenance, such as secondary containment around fuel tanks or the condition of spill response kits.
- Seeded areas will be assessed for revegetation progress and weed species will be identified by a knowledgeable person

Maintenance Procedures

Temporary and permanent erosion and sediment control BMPs will be maintained and repaired as needed to assure continued performance of their intended function. All maintenance and repair will be conducted in accordance with BMP inspections. Maintenance activities to correct problems noted during inspections must be documented. If a BMP is replaced or added, this SWMP must be updated to within at least three (3) calendar days.

All structural control measures will be properly installed and maintained in accordance with any relevant manufacturer specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the SWMP manager would replace or modify the control for site situations as soon as possible. If litter, debris or chemicals could be exposed to stormwater, they need to be prevented from becoming a pollutant source in stormwater discharges.

Temporary erosion and sediment control BMPs will be removed after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment will be removed or stabilized on site. Disturbed soil areas resulting from removal of BMPs or vegetation will be permanently stabilized as soon as possible.

Record Keeping

Documentation of the inspections would be conducted and maintained until the site has achieved final stabilization and the stormwater permit is terminated. The following items will be documented during the inspections:

- Date of Inspection.
- Any incidence of non-compliance and a brief explanation of measures to be taken to prevent future violations and measures taken to clean up the sediment that has left the site.
- The report will contain a signed certification indicating the site is in compliance once adequate measures have been taken and recorded to correct any problems.
- Any notes on the need for and performance of preventative maintenance and other repairs.

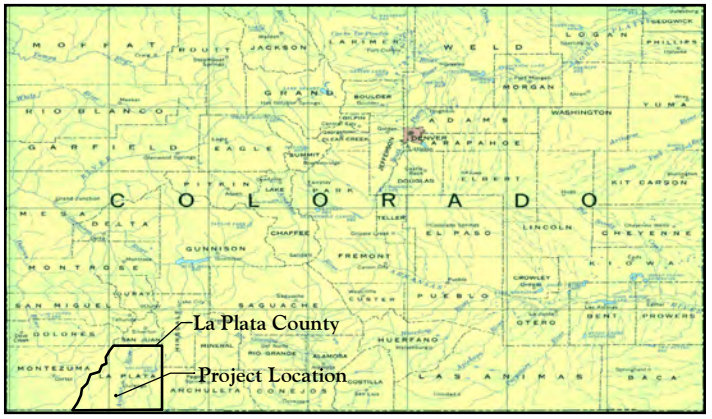
References

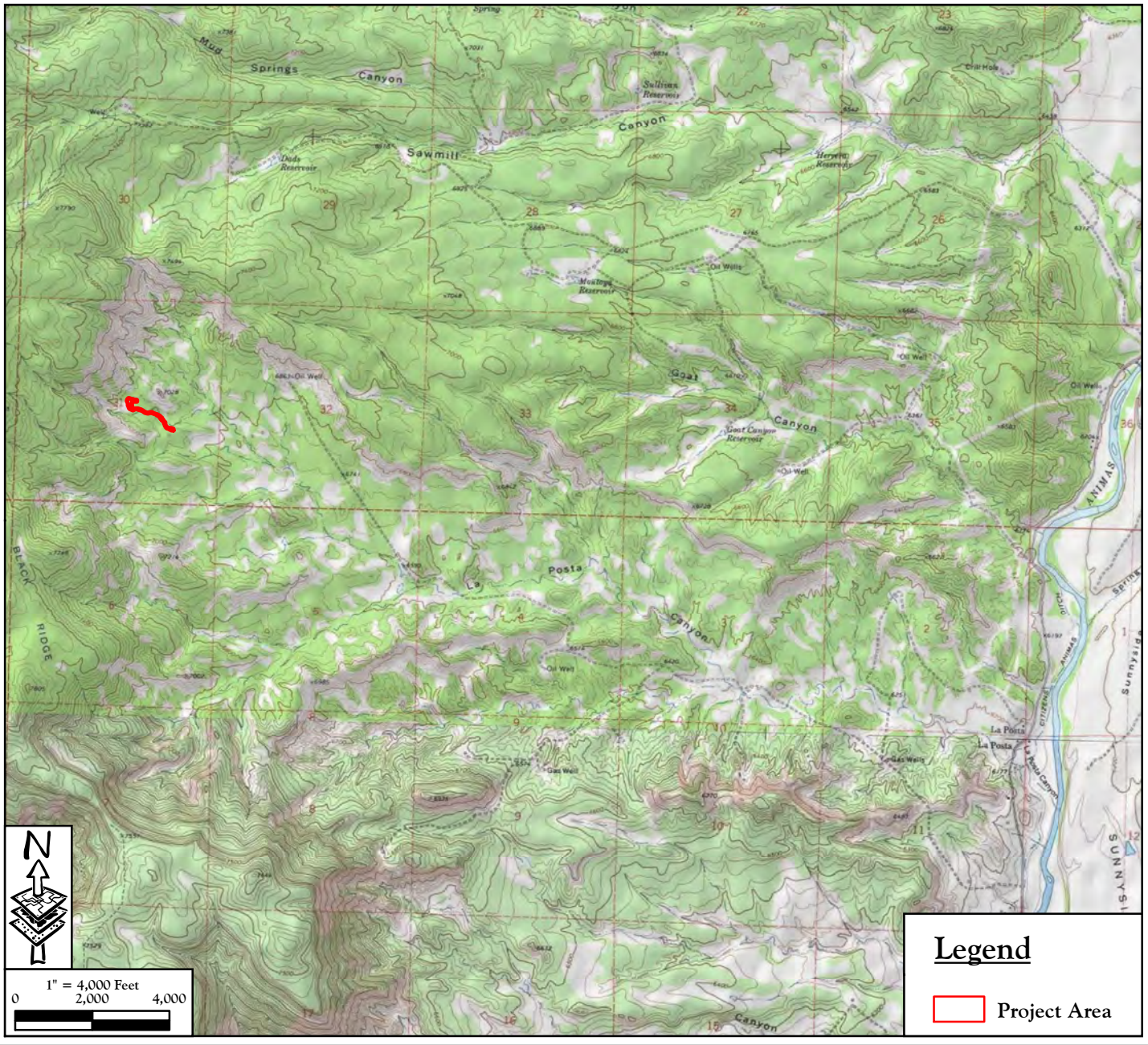
Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed [05/8/2015].

EPA, Hows My Waterway? web. 8 May 2015.
http://watersgeo.epa.gov/mywaterway/rdetail.html

PROJECT LOCATION:
Township 34 North, Range 10 West, Section 31
New Mexico Principal Meridian,
La Plata County, Colorado.

CENTROID LOCATION:
Latitude: 37° 8' 48.528" N
Longitude: -107° 58' 24.161" W





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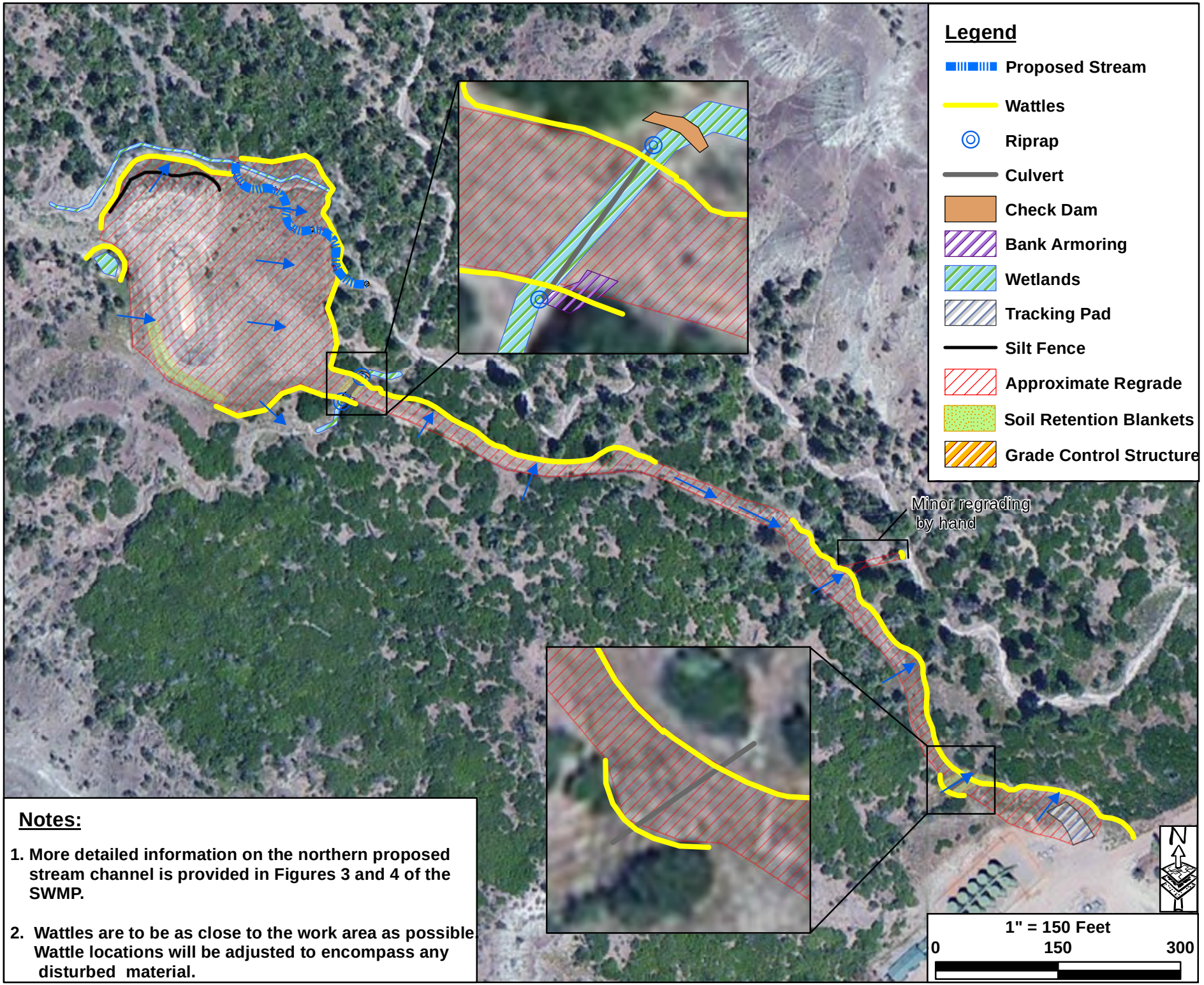
PROJECT LOCATION MAP

ARGENTA 34-10 #31-1 RECLAMATION
STORMWATER MANAGEMENT PLAN

FIGURE 1

Source: Basin Mountain. 7.5' USGS Quadrangle.



Notes:

1. More detailed information on the northern proposed stream channel is provided in Figures 3 and 4 of the SWMP.

2. Wattles are to be as close to the work area as possible. Wattle locations will be adjusted to encompass any disturbed material.

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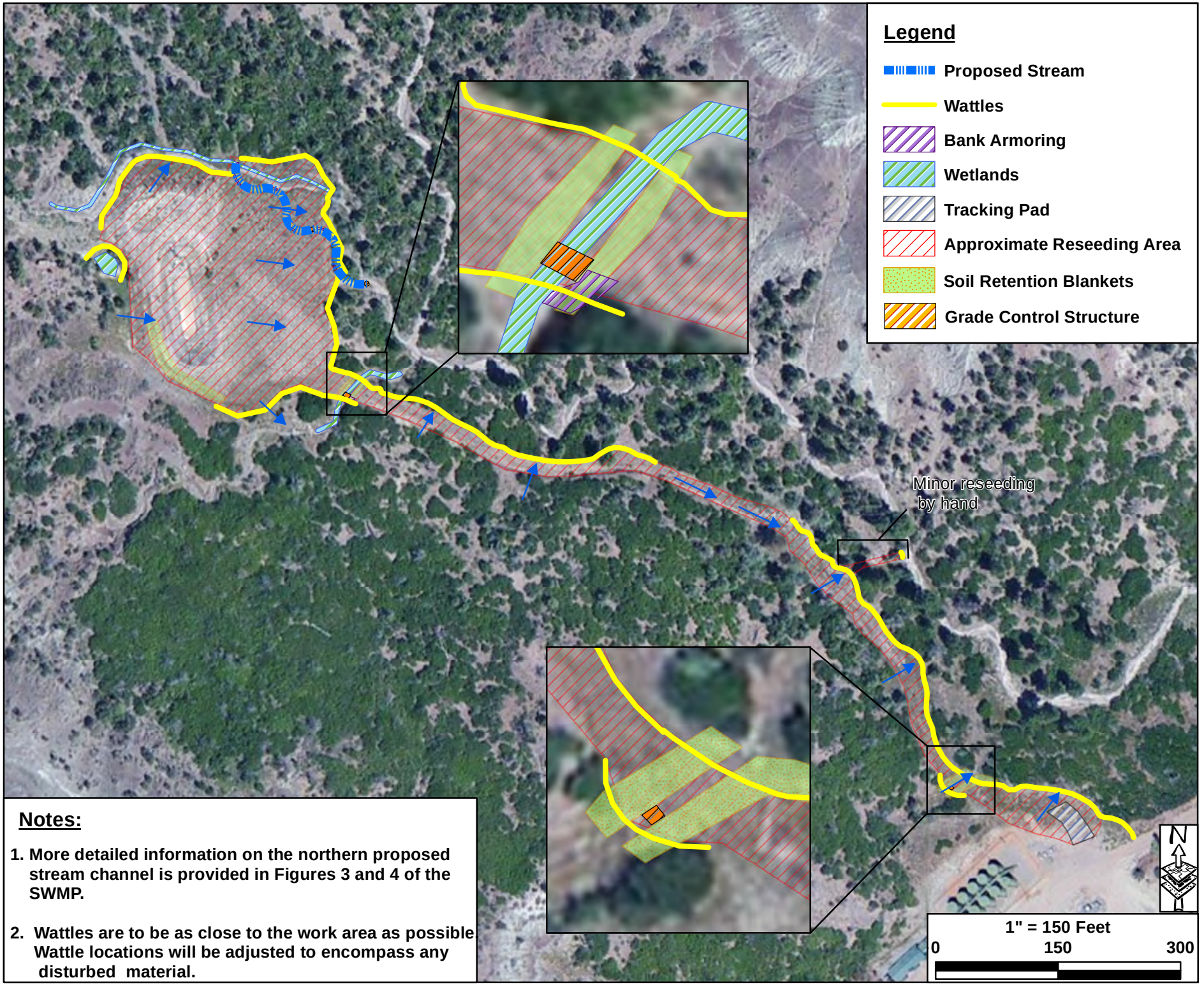
BMP LOCATION MAP: PHASE 1
STORMWATER MANAGEMENT PLAN
ARGENTA 34-10 #31-1 RECLAMATION

Date:	7/22/2015
Pro #:	1500020
Name:	Figure 3.0
Scale:	1" = 150'

Source: (c) 2014 ESRI ArcGIS Online.

2A



Notes:

1. More detailed information on the northern proposed stream channel is provided in Figures 3 and 4 of the SWMP.

2. Wattles are to be as close to the work area as possible. Wattle locations will be adjusted to encompass any disturbed material.

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BMP LOCATION MAP: PHASE 2
STORMWATER MANAGEMENT PLAN
ARGENTA 34-10 #31-1 RECLAMATION

Date:	7/22/2015
Pro #:	1500020
Name:	Figure 3.0
Scale:	1" = 150'

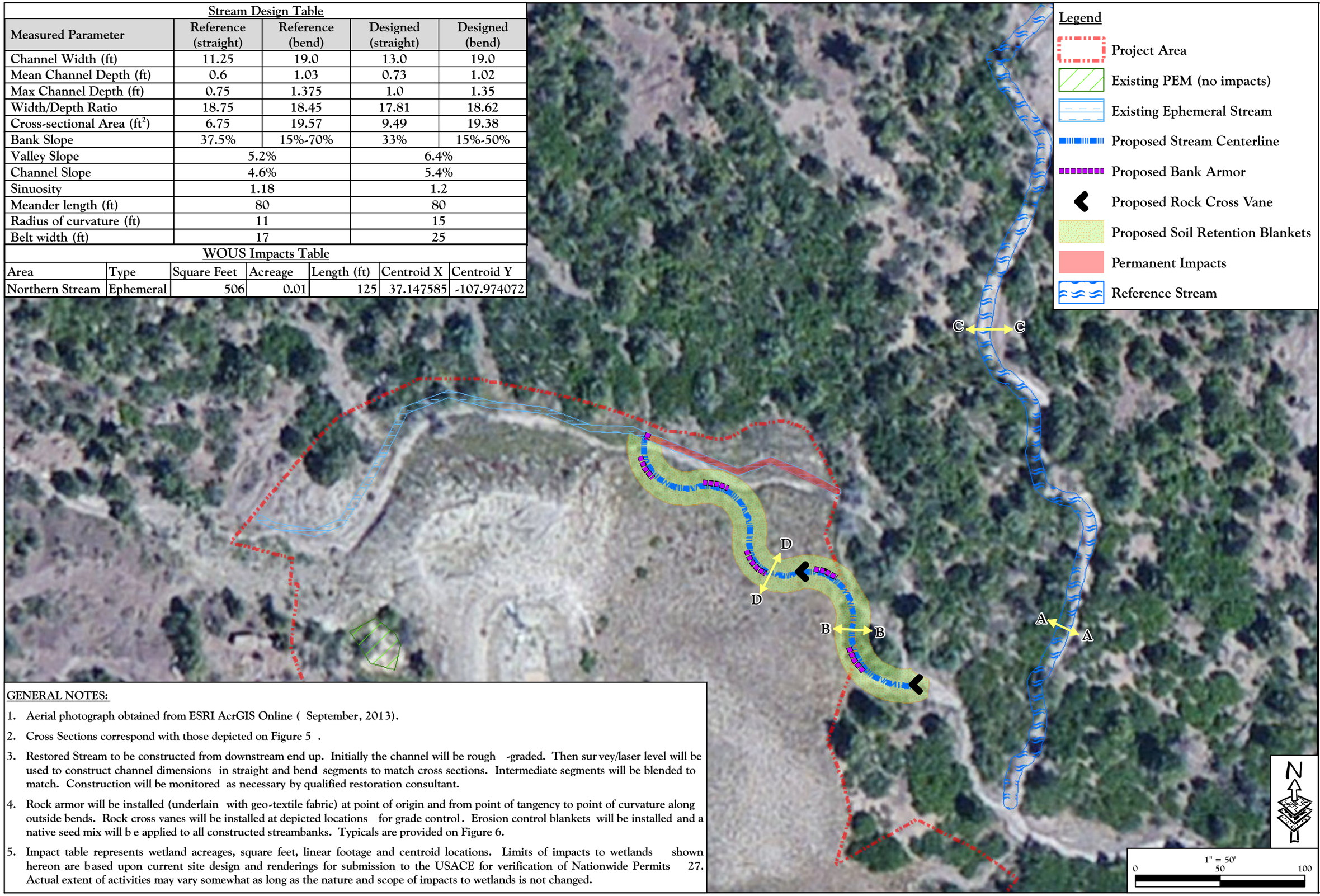
2B

Stream Design Table

Measured Parameter	Reference (straight)	Reference (bend)	Designed (straight)	Designed (bend)
Channel Width (ft)	11.25	19.0	13.0	19.0
Mean Channel Depth (ft)	0.6	1.03	0.73	1.02
Max Channel Depth (ft)	0.75	1.375	1.0	1.35
Width/Depth Ratio	18.75	18.45	17.81	18.62
Cross-sectional Area (ft^2)	6.75	19.57	9.49	19.38
Bank Slope	37.5%	15%-70%	33%	15%-50%
Valley Slope	5.2%		6.4%	
Channel Slope	4.6%		5.4%	
Sinuosity	1.18		1.2	
Meander length (ft)	80		80	
Radius of curvature (ft)	11		15	
Belt width (ft)	17		25	

WOUS Impacts Table

Area	Type	Square Feet	Acreage	Length (ft)	Centroid X	Centroid Y
Northern Stream	Ephemeral	506	0.01	125	37.147585	-107.974072



Legend

- Project Area
- Existing PEM (no impacts)
- Existing Ephemeral Stream
- Proposed Stream Centerline
- Proposed Bank Armor
- Proposed Rock Cross Vane
- Proposed Soil Retention Blankets
- Permanent Impacts
- Reference Stream

GENERAL NOTES:

1. Aerial photograph obtained from ESRI AcrGIS Online (September, 2013).
2. Cross Sections correspond with those depicted on Figure 5 .
3. Restored Stream to be constructed from downstream end up. Initially the channel will be rough -graded. Then sur vey/laser level will be used to construct channel dimensions in straight and bend segments to match cross sections. Intermediate segments will be blended to match. Construction will be monitored as necessary by qualified restoration consultant.
4. Rock armor will be installed (underlain with geo-textile fabric) at point of origin and from point of tangency to point of curvature along outside bends. Rock cross vanes will be installed at depicted locations for grade control. Erosion control blankets will be installed and a native seed mix will b e applied to all constructed streambanks. Typicals are provided on Figure 6.
5. Impact table represents wetland acreages, square feet, linear footage and centroid locations. Limits of impacts to wetlands shown hereon are based upon current site design and renderings for submission to the USACE for verification of Nationwide Permits 27. Actual extent of activities may vary somewhat as long as the nature and scope of impacts to wetlands is not changed.

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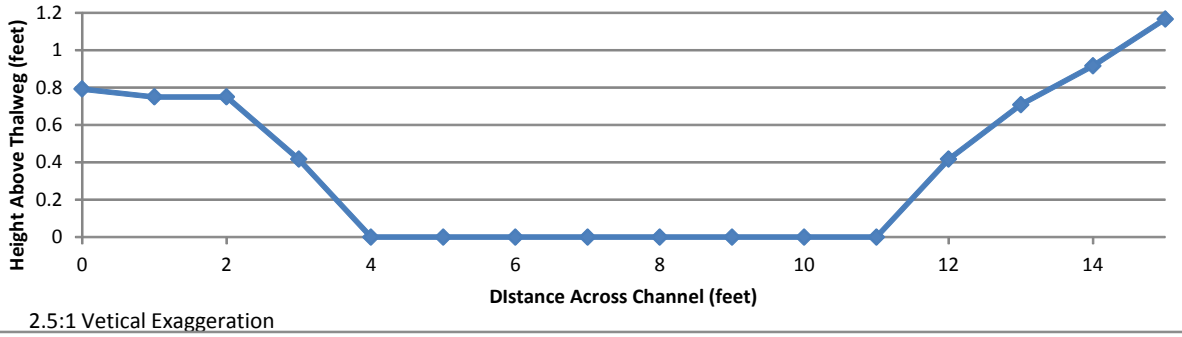
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

NORTHERN STREAM RESTORATION PLAN
AREGENTA 34-10 #31-1 RECLAMATION
STORMWATER MANAGEMENT PLAN

Date: 07/19/2015
Pro. #: 150020
Prepared by: T. Funk

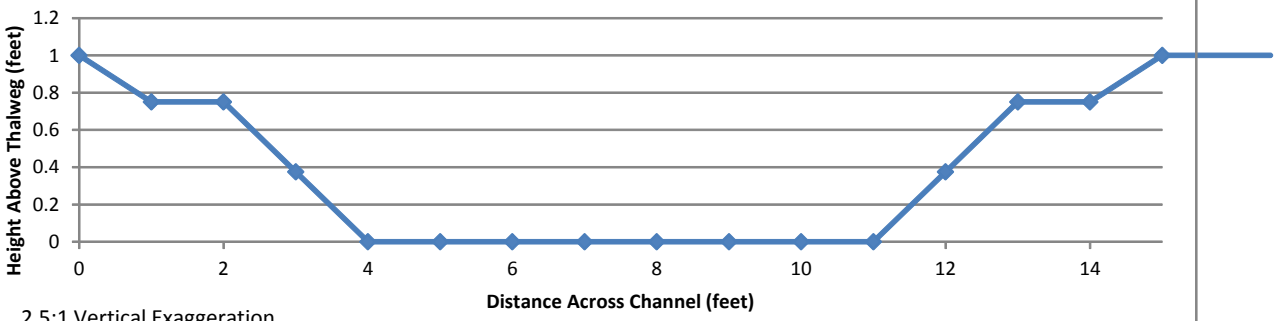
Source: Aerial photo provided by ESRI ArcGIS Online.

Cross Section A-A: Reference Straight



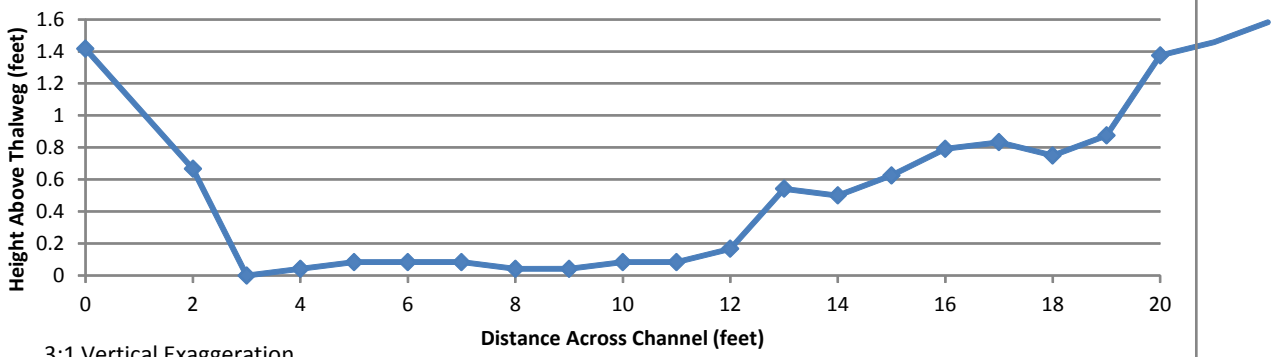
2.5:1 Vetical Exaggeration

Cross Section B-B: Designed Straight



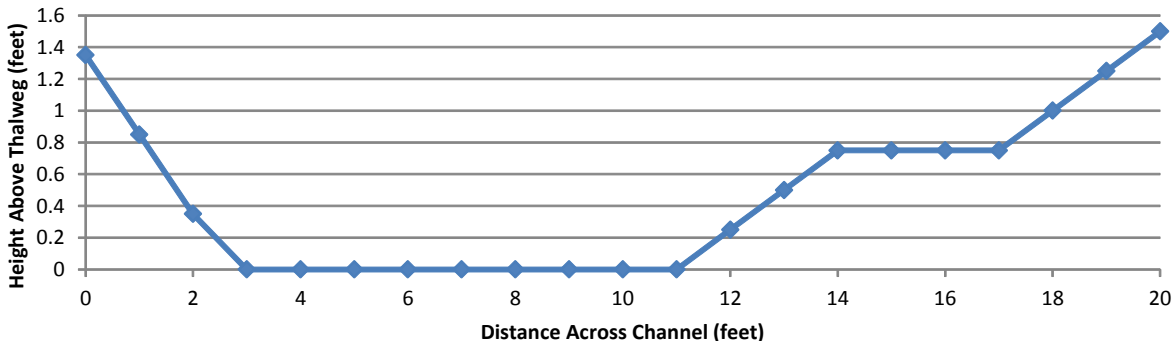
2.5:1 Vertical Exaggeration

Cross Section C-C: Reference Bend



3:1 Vertical Exaggeration

Cross Section D-D: Designed Bend



3:1 Vertical Exaggeration

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STREAM RESTORATION
CROSS SECTIONS

AREGENTA 34-10 #31-1 RECLAMATION
NORTHERN STREAM RESTORATION
STORMWATER MANAGEMENT PLAN

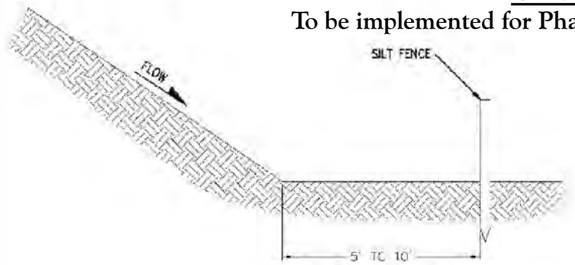
FIGURE 4

Notes: Based Field Surveyed Measurements

ATTACHMENT A
BMP TECHNICAL DRAWINGS

Silt Fence

To be implemented for Phase 1 and removed for Phase 2

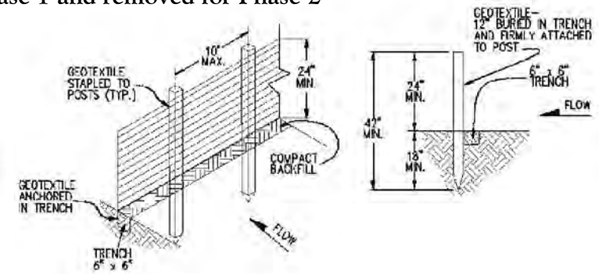


SECTION A–A

TOE OF SLOPE PROTECTION

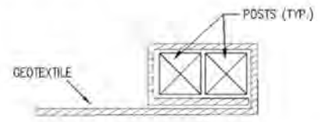
NOTES

1. SILT FENCE SHALL HAVE A MAXIMUM DRAINAGE AREA OF ONE–QUARTER ACRE PER 100 FEET OF SILT FENCE LENGTH; MAXIMUM SLOPE LENGTH BEHIND BARRIER IS 100 FEET; MAXIMUM GRADIENT BEHIND THE BARRIER IS 2:1.
2. SILT FENCE USED AT TOE OF SLOPE SHALL BE PLACED 5 TO 10 FEET BEYOND TOE OF SLOPE TO PROVIDE STORAGE CAPACITY.
3. SILT FENCE SHALL BE PLACED ON THE CONTOUR, WITH ENDS FLARED UP SLOPE.



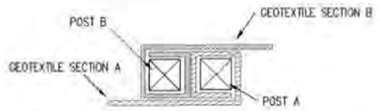
SILT FENCE

GEOTEXTILE SHALL BE ATTACHED TO WOOD POSTS WITH THREE OR MORE STAPLES PER POST. STAPLES SHALL BE 1/2"
WOOD POST SHALL BE 1 1/2" X 1 1/2" NOMINAL.



END SECTION DETAIL (PLAN VIEW)

GEOTEXTILE SHALL BE FOLDED AROUND TWO POSTS ONE FULL TURN. SECURE GEOTEXTILE TO POSTWITH THREE STAPLES MINIMUM.

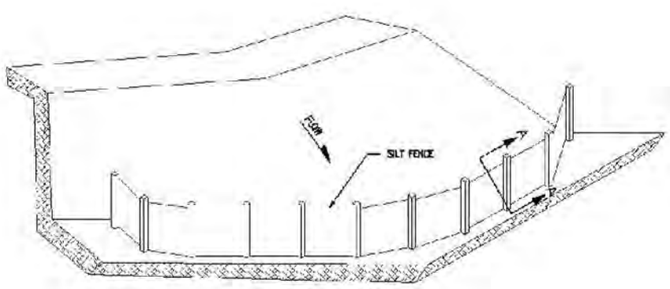


JOINING SECTION DETAIL (PLAN VIEW)

FOLD GEOTEXTILE AROUND EACH POST ONE FULL TURN. SECURE GEOTEXTILE TO POST WITH THREESTAPLES MINIMUM.POSTS SHALL BE TIGHTLY ABUTTED WITH NOGAPS TO PREVENT POTENTIAL FLOW–THROUGHOF SEDIMENT AT JOINT.

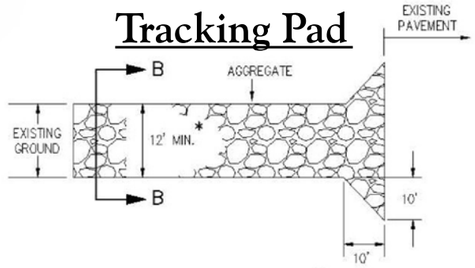
SILT FENCE

GEOTEXTILE SHALL BE ATTACHED TO WOOD POSTS WITH THREE OR MORE STAPLES PER POST. STAPLES SHALL BE 1/2"
WOOD POST SHALL BE 1 1/2" X 1 1/2" NOMINAL.



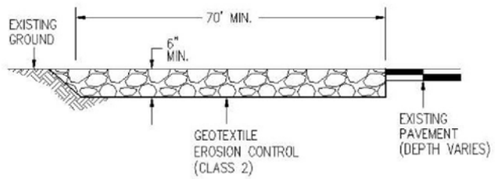
ISOMETRIC VIEW

Tracking Pad

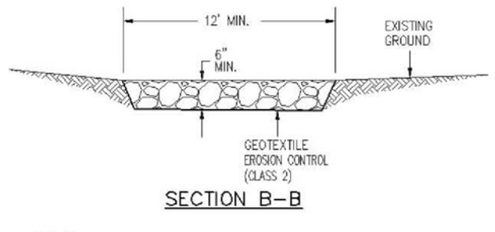


PLAN VIEW

* SHALL EXTEND FULL WIDTH OF INGRESS AND EGRESS OPERATION.



ELEVATION SECTION



SECTION B–B

NOTES:

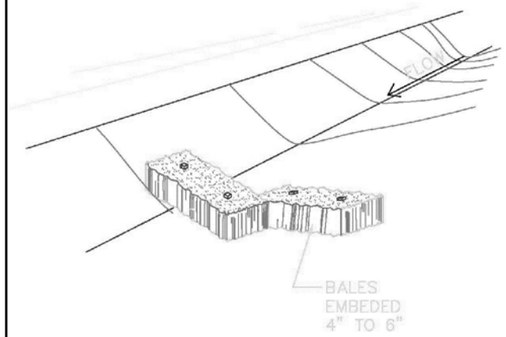
THE CONTRACTOR SHALL PROTECT CURB AND GUTTER THAT CROSSES THE ENTRANCE FROM DAMAGE. PROTECTION OF THE CURB AND GUTTER WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.

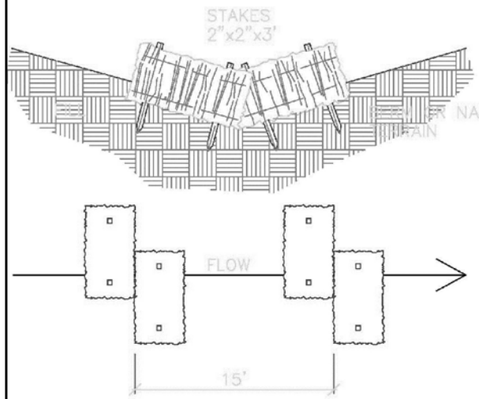
VEHICLE TRACKING PAD

To be implemented for Phase 1 and removed after Phase 2

Check Dam

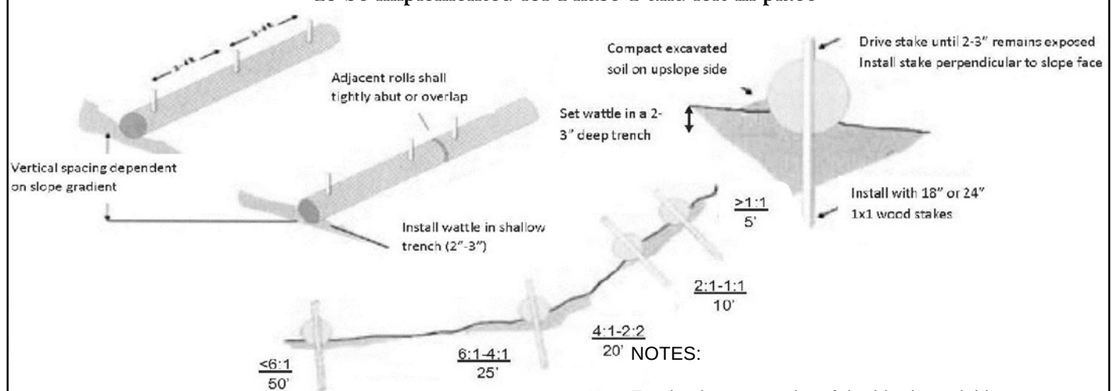
To be implemented for Phase 1 and removed for Phase 2





Erosion Logs

To be implemented for Phase 1 and left in place



NOTES:

Erosion logs are to be of the bio-degradable type
Recommend logs remain in place upon final stabilization

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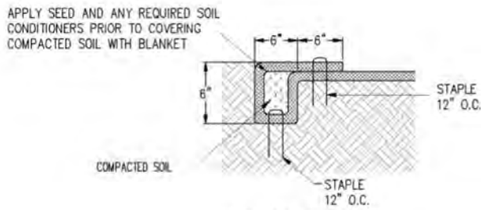
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

BMP INSTALLATION AND MAINTENANCE DETAILS
STORMWATER MANAGEMENT PLAN
ARGENTA 34-10 #31-1 RECLAMATION

Date: 05/11/2015
Pro. #: 150020

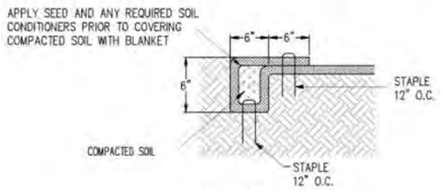
Soil Retention Blankets

To be implemented for Phase 2 and left in place



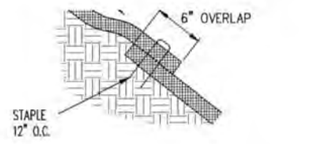
ANCHOR TRENCH
SECTION A

TO BE USED AT THE BEGINNING AND END OF THE CHANNEL ACROSS IT'S ENTIRE WIDTH.



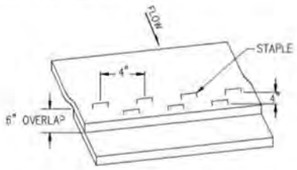
ANCHOR TRENCH
SECTION A

TO BE USED AT THE BEGINNING AND END OF THE CHANNEL ACROSS IT'S ENTIRE WIDTH.



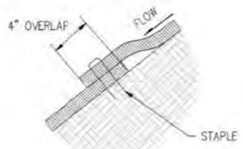
CONSECUTIVE ROLL OVERLAP
SECTION B

TO BE USED WHEREVER ONE ROLL OF BLANKET ENDS AND ANOTHER BEGINS WITH THE UPHILL BLANKET PLACED ON TOP OF THE BLANKET ON THE DOWNHILL SIDE.



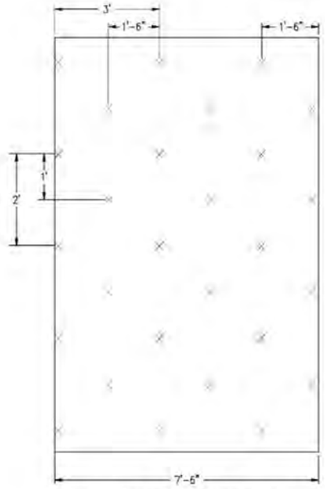
CONSECUTIVE ROLL OVERLAP
SECTION B

TO BE USED WHEREVER ONE ROLL OF BLANKET ENDS AND ANOTHER BEGINS WITH UPSTREAM BLANKET PLACED ON TOP OF THE BLANKET ON THE DOWNSTREAM SIDE.



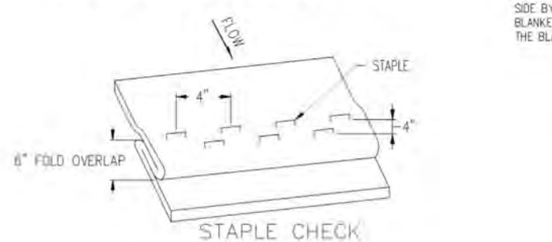
SIDE SEAM OVERLAP
SECTION C

TO BE USED FOR OVERLAP WHEN 2 WIDTHS OF BLANKET ARE APPLIED SIDE BY SIDE WITH THE UPHILL BLANKET PLACED ON TOP OF THE BLANKET ON THE DOWNHILL SIDE.



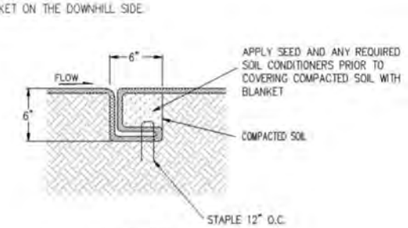
TYPICAL STAPLE PATTERN
FOR CHANNEL APPLICATION

SEE SUBSECTION 216.05.



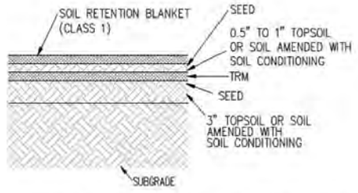
STAPLE CHECK
SECTION C

TO BE USED ON SLOPE EVERY 35 FEET.



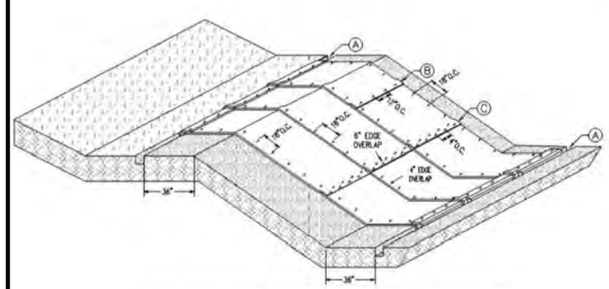
CHANNEL CHECK SLOT
SECTION D

TO BE USED AT 30' INTERVALS IN CHANNEL FLOWLINE.

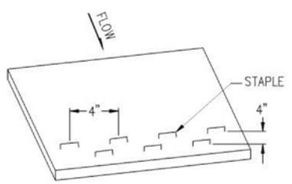


SOIL FILLED TRM APPLICATION

1. PLACE 3" TOPSOIL OR SOIL AMENDED WITH SOIL CONDITIONING.
2. APPLY SEED AND RAKE INTO SOIL.
3. INSTALL TRM.
4. PLACE 0.5" TO 1" TOPSOIL OR SOIL AMENDED WITH SOIL CONDITIONING.
5. APPLY SEED AND RAKE INTO SOIL.
6. INSTALL SOIL RETENTION BLANKET (CLASS 1).

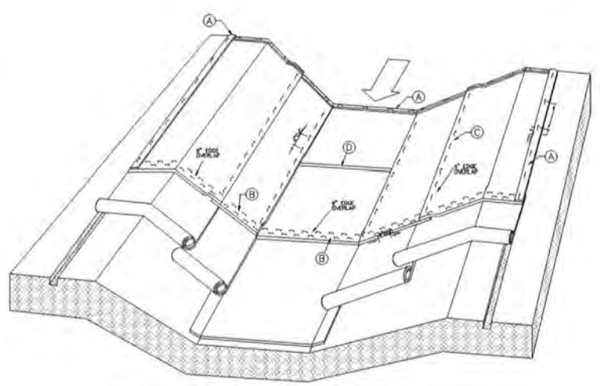


SOIL RETENTION BLANKETS/TURF REINFORCEMENT MATS (TRM)
SLOPE APPLICATION



DOWNSLOPE END STAPLE CHECK

TO BE USED WHEN SLOPE RUNS INTO A RECEIVING WATER AND CANNOT BE EXTENDED 3 FEET BEYOND SLOPE.

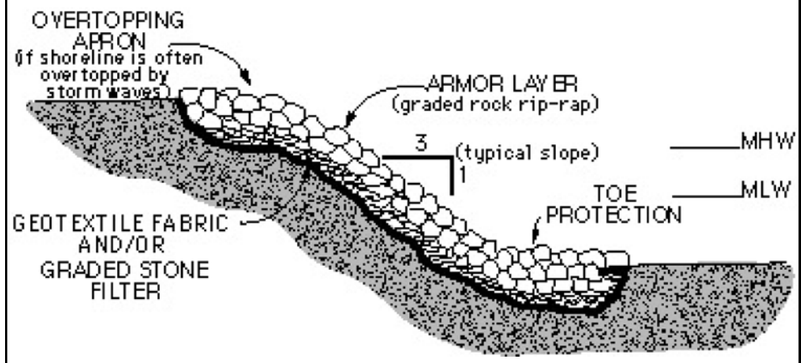


SOIL RETENTION BLANKETS/TURF REINFORCEMENT MATS (TRM)
CHANNEL APPLICATION

IN ACCORDANCE WITH SECTION 216.

Bank Armoring

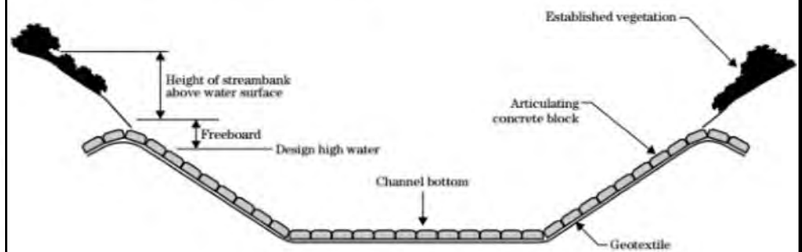
To be implemented for Phase 1 and left in place



Grade Control

To be implemented for Phase 2 and left in place

Armoring the entire cross section



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PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

BMP INSTALLATION AND MAINTENANCE DETAILS
STORMWATER MANAGEMENT PLAN
ARGENTIA 34-10 #31-1 RECLAMATION

Date: 05/11/2015
Pro. #: 150020

ATTACHMENT B
INSPECTION CHECKLIST

Argenta 34-10 #31-1 Reclamation
Erosion and Sediment Control Inspection Form

Inspector(s):_____Date:_____

Current Weather Conditions:_____

Description of current discharges:_____

_____

BMP Designation	O.K	Not O.K.	BMP Condition, Corrective Action, General Notes
Construction Access Trackout? Street Clean?			
Soil Stabilization Signs of Erosion: Gullies? Slope Failures? Rills?			
Slope Protection Plastic Condition? Grass Growing? Hydroseed Condition? Matting?			
Perimeter Control Clearing Limits Marked? Silt Fences? Swales?			
Conveyances Stable Ditches? Check Dams Intact? Slope Drains?			
SWMP Update Revisions Required?			

Argenta 34-10 #31-1 Reclamation
Erosion and Sediment Control Inspection Form

BMP Designation	O.K	Not O.K.	BMP Condition, Corrective Action, General Notes
Outlet Protection Stabilized?			
Storm water Detention Basins %filled w/ Sediment?			
General BMP Maintenance and Stormceptors %filled w/ Sediment?			
Dust Control Veg Cover?			
Spill Prevention Material Storage? Spill Containment Kit? Secondary Containment?			
Condition of Discharge Water Sediment? Oil Sheen? Foam?			
Condition of Preserve Fencing? Discharges? Hydrology Impacts?			

Location(s) of discharges of sediment or pollutants from the site:

Location(s) of BMPs that need to be maintained:

Location(s) of BMPs that failed to operate as designed or are inadequate:

Corrective action required including any changes to the SWMP necessary and implementation dates:

Additional Comments:

Note: A record of each inspection and any actions taken must be retained as part of this SWMP for at least three years from the date the permit coverage expires or is terminated.

Inspector Name and Title

Attachment D

WEED MANAGEMENT PLAN

Argenta 34-10 # 31-1 Reclamation

LA PLATA COUNTY, COLORADO

Prepared for:

ConocoPhillips

3401 East 30th Street
Farmington, New Mexico 87402

Prepared by:

SME
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JULY 2015

INTRODUCTION

This document addresses a site specific weed management plan included within the required actions that were cited during a Colorado Oil and Gas Conservation Commission (COGCC) field inspection dated March 24, 2015 of the ConocoPhillips Argenta 34-10 #31-1 site.

Since 1990, the Colorado State Department of Agriculture has protected the state's natural resources by enforcing regulations controlling noxious weeds. More recent revisions to the *Colorado Noxious Weed Act (35-5.5-101-119 C.R.S.)* enables County and City governments to implement management programs aimed at noxious weeds in order to reclaim infested acres and protect weed-free land. The Act requires landowners and managers to manage noxious weeds if they are likely to damage neighboring lands. This Act provides that each county in Colorado shall adopt a noxious weed management plan for the unincorporated portions of the county. *The La Plata County Weed Management and Enforcement Plan* provides a framework to control those plant species that are listed as "noxious" in La Plata County.

This document details the specific weed management plan for final reclamation of the ConocoPhillips Argenta 34-10 #31-1 site has been prepared based on requirements and guidelines of noxious weed identified by the commissioner or the department by rule pursuant to the terms and provisions of the Colorado Noxious Weed Act. Such weeds may be referred to herein as "state A list," "state B list" or "state C list" weeds depending upon their designation as such by the commissioner pursuant to the terms of *C.R.S. § 35-5.5-108* and the *La Plata County Weed Management and Enforcement Plan Annex B Pursuant to Article II of Chapter 58 of the La Plata County Code and the Colorado Noxious Weed Act* (attached within Appendix A).

DESCRIPTION OF THE PROJECT AREA

ConocoPhillips Company proposes reclamation of the existing ConocoPhillips Argenta 34-10 #31-1 site (Figure 1). The undeveloped site is located on La Posta Canyon Road, approximately 8 miles southwest of Durango, Colorado. This site is on private lands within unincorporated La Plata County. Reclamation would be confined to the previously permitted area within Section 31 of Township 34 N and Range 10 W. The project area is situated within La Posta Canyon at an elevation of approximately 7,000 feet above sea level. A location map is included within the SWMP for the existing ConocoPhillips Argenta 34-10 #31-1 site (Figure 1).

This weed management plan includes 72,652 sq. ft. (1.67 acres) of surface disturbances associated with the reclamation of the Argenta 34-10 #31-1 site and access road (Weed Management Plan Figure 1). In the event that additional fill material is required for reclamation the disturbance area may increase. These areas will be reclaimed accordingly.

An onsite field investigation was conducted on April 24, 2015 to survey the surrounding historical habitat. Evidence of past fire events within La Posta Canyon include charred snags of fire damaged (*Pinus edulis*) Colorado Pinyon and (*Juniperus osteosperma*) Utah juniper trees. The historic vegetative community surrounding the Argenta 34-10 Unit 31-1 site is dominated by Piñon- Juniper community including Gambel's Oak (*Quercus gambelii*), antelope bitterbrush (*Purshia tridentata*), cliff fendlerbush (*Fendlera rupicola*), rubber rabbitbrush (*Ericameria*

nauseosa), and big sage (*Artemisia tridentata*). The historical habitat supports dominant associated understory species including tufted evening primrose (*Oenothera caespitosa*), broom snakeweed (*Gutierrezia sarothrae*), double bladderpod (*Physaria acutifolia)*, and graminoid species including ricegrass (*Oryzopsis hymenoides*), an alkali sacaton (*Sporobolus airoides*). Areas specified in reference photos below were successfully reclaimed with penstemon species (Penstemon sp.), yellow sweet clover (*Melilotus officinalis*), sunflower (*Helianthus annuus*), Fendler's Biscuitroot (*Cymopterus glomeratus*), smooth brome (*Bromus inermes*), and regrowth of Gambel's oak, rabbit brush, and big sage shrubs.

INVENTORY OF WEED SPECIES

An inventory of La Plata County listed weed species was conducted during the April 24, 2015 field investigation. The entire site, including previously graded areas, access road and adjacent habitat was surveyed, mapped and flagged. The site was surveyed for areas that have successfully been revegetated and currently have vegetative cover of 80% pre- existing vegetation. Areas defined as infestations were based on the density (% vegetation cover) and distribution of La Plata County listed weed species. Areas that were dominated by listed weed species and did not meet 80% of pre-existing vegetation, excluding noxious weeds, were mapped as infestation areas (Figure 1). Site photograph PP1 (below) taken on April 24, 2015 captures site conditions of weed infestation areas mapped on Figure 1.

Weed species found at the Argenta 34-10 Unit 31-1 site include musk thistle (*Carduus nutans*), Canada thistle (*Cirsium arvense*), and houndstongue (*Cynoglossum officinale*). All three species are La Plata County B list weeds, defined within the La Plata County Management Plan as:

> *B list weeds shall mean all populations of noxious weeds in the county that are designated for required management, either by the commissioner pursuant to the terms of C.R.S. § 35-5.5-108 or by local designation by the BOCC.*

PP1is looking northwest at the ephemeral channel to the north of the existing well pad location. Approximately 200 ft of the 2ft wide channel is dominated by Canada thistle and will be re-contoured and re-aligned to the historic channel location see Figure 1.

MANAGEMENT GOALS AND WEED MANAGEMENT OBJECTIVES FOR THE PROPERTY

The Argenta 34-10 #31-1 site will need to comply with Colorado Oil and Gas Conservation Commission (COGCC) http://cogcc.state.co.us/ *1000 Series Reclamation Rules guidelines for weeds and reclamation* and meet requirements for Final Reclamation. *Rule 1004e- Final Reclamation- Weed Control* states*:*

Final Reclamation

- *Reclaim to reference area or final land use*
- *Plug well, remove associated production facilities*
- *Includes lease roads, culverts, road base*
- *Pit Closure: Production and special purpose pits*
- *Re-vegetation to 80% of pre-disturbance vegetation*
- *Weed Control*

The operator will submit a plan for the surface reclamation or stabilization of all disturbed areas that reflects pre-disturbance or reference area forbs, shrubs, and grasses. The site will reach a total plant cover of at least 80% pre-disturbance reference area levels, excluding noxious weeds.

The land management goal for the Argenta 34-10 #31-1 site is final reclamation. Reclamation efforts will adhere to the Stormwater Management Plan (SWMP) and this Weed Management Plan to achieve Final Reclamation requirements. Weed control will be ongoing, in conjunction with the SWMP, in order to reach land management goals to eliminate or control La Plata County listed weed species, as well as meet legal requirements associated with final reclamation. Proliferation of noxious weed species at the site will interfere with the goal of achieving 80% vegetative cover of pre-disturbance vegetation, excluding noxious weeds and prolong land management goals. Therefore, specific integrated weed management plans are defined below for each species that occurs at the site.

Areas to be reclaimed will be re-contoured to blend with the surrounding landscape, emphasizing restoration of existing drainage patterns and landform to pre-construction condition, to the extent practicable. Success of the re-vegetation will be monitored during stormwater inspections. Refer to the Storm Water Management Plan for additional water management/erosion control.

Following final contouring, the backfilled or ripped surfaces will be covered evenly with stockpiled topsoil. Final seedbed preparation will consist of raking or harrowing the spread topsoil prior to seeding to promote a firm (but not compacted) seedbed without surface crusting. Seedbed preparation may not be necessary for topsoil storage piles or other areas of temporary seeding.

At the reclamation contractor's discretion, seedbed preparation of compacted areas will be ripped to a minimum depth of 12 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping will be conducted in two passes at perpendicular directions. Disking will be conducted if large clumps or clods remain after ripping. Any tilling or disking that occurs along the contour of the slope and seed drills will also be run along the contour to provide terracing and prevent rapid run-off and erosion. Where broadcast seeding is used and erosion blankets are needed, a dozer or other tracked equipment will track perpendicular to the slope prior to broadcast seeding.

Soil Amendments

Humate soil conditioner will be applied via broadcasting at 200 to 250 lbs. per acre prior to all seeding applications. Humic acid will improve plant's ability to take in vital nutrients, thus aiding in growth and development.

Seeding Methods

Per the NRCS 2009 Recommended Planting Rates, seeding is defined as the amount of seed of an individual species that's needed to achieve an adequate stand. This is expressed in pure live seed (PLS) pounds per acre and is based on planting a predetermined number of live seeds per square foot to achieve a specific plant density. For conservation purposes, seeding rates have been established to achieve the desired plant density of around 20-60 live seeds per square foot. Foothills native mix would be appropriate for the site. Seed mixes ordered to specify the PLS % is recommended to ensure successful seeding rates and final successful vegetative cover.

The reclamation contractor will ensure that perennial grasses and shrubs are planted at the appropriate depth. Intermediate size seeds (such as wheatgrasses and shrubs) will be planted at a

depth of 1 to 2 inches. Small seeds (such as alkali sacaton and sand dropseed) will be planted at a depth of 0.25 inches. In situations where differing planting depths are not practicable using available equipment, the entire seed mix will be planted no deeper than 0.25 inch. Seeding is to be applied at double the specified application rate with the addition of a sterile, fast-growing cover crop (such as QuickGuard) to develop a dense fibrous vegetation to stabilize soils while allowing the desirable perennial species to establish. Watering would be dependent upon seasonal conditions and timing of seeding. Monitoring rainfall at the site during the phased reclamation would ensure adequate measures are taken to supply water to seeded areas.

Broadcast Seeding

Broadcast seeding will be the preferred seeding method on steep slopes or other areas that cannot be accessed with other seeding equipment, areas that will be covered with erosion control blankets and other areas determined appropriate by the inspector. Seed will be broadcast with a mechanical or hand seeder immediately after the seedbed has been prepared and the soil is loose. This will allow the seeds to be lightly covered as the soil settles. Broadcast seeding will occur immediately prior to installation of erosion fabric or application of mulch (straw or wood). Broadcast application of seed requires a doubling of the drill-seeding rate. The seed will then be raked or harrowed into the ground so that the seed is planted no deeper than 0.25 inch below the surface.

Drill Seeding

Drill seeding will be used on gently sloping areas where equipment and drills can safely operate and in areas that do not specify erosion blankets (Phase 2 BMP Map- Figure 2 of the SWMP. Where drill seeding is not practicable due to topography, the reclamation contractor will hand-broadcast seed using a “cyclone” hand seeder or similar broadcast seeder.

Mulching

Dry straw mulch will be applied on all areas where necessary to stabilize the soil except in those areas specifically calling for the implementation of erosion blankets. Mulch sources will be comprised of dry straw mulching and erosion blankets.

Dry Straw Mulch

Dry straw/hay mulch will be certified weed-free and will be uniformly applied to cover the entire site with no bare areas within four hours of seeding completion. Hay is to be applied at 1.5 tons per acre and is generally preferred to straw which is to be applied at 2 tons per acre. Mulch is to be anchored into the ground via mechanical crimping to a depth of 1 to 2 inches, mechanical crimping must be performed parallel to contour in order too effectively reduce erosion and encourage plant growth. Do not apply dry straw mulch when windy conditions are present.

Erosion Blankets

Steep slopes shall be protected with erosion blankets to control erosion, retain sediment resulting from sheet-flow runoff and protect newly seeded area.

The disturbed area shall be uniform with no large rocks, vegetation or rilling prior to placing blankets. Areas where blankets are to be installed shall be properly prepared with topsoil and seeded prior to installation. Blankets at the top and bottom of the slope shall be trenched in 6 inches wide by 6 inches deep with the trench at the top of the slope extending beyond the crest of the slope. Blankets shall be placed smoothly but loosely on the soil surface without stretching and stapled to the soil as specified by the manufacturer. Details on soil retention blanket installation and specific locations can be found in the Argenta 34-10 #31-1SWMP.

MONITORING

Inspection of the project area for noxious or invasive weeds listed by the Colorado Department of Agriculture will occur after earthwork and seeding activities and in conjunction with storm water inspections. Monitoring both for the Stormwater Management in addition to yearly monitoring by a biologist during the growing season will ensure that outbreaks of noxious weed cover would be documented and remedied (i. e. sprayed and re-seeded) as necessary to achieve 80% re-vegetation, excluding weeds. Specific weed management plans for noxious weed species found on site are included below.

Should listed weeds considered "Enforceable" by the Colorado Noxious Weed Act and outbreaks of noxious weed cover be documented during monitoring, ConocoPhillips will comply with La Plata County Weed Office requirements in addition to instructions for weed treatments and integrated weed management plans included above to remedy noxious weed cover. This will include documenting the period of treatment, approved herbicides that may be used, and any other site-specific instructions that may be applicable. ConocoPhillips will manage weeds at the proposed site with the following general practices:

- Any "Enforceable" or noxious weeds will be treated prior to commencement of construction to prevent incorporation into the soil.

Final stabilization is achieved and reclamation complete when the disturbed areas are returned to 80 % vegetative cover of pre-disturbance conditions, excluding listed weed species as practicable according to La Plata County requirements and COGCC 1000 Series Reclamation Rules guidelines for weeds and reclamation for final abandonment for the ConocoPhillips Argenta 34-10 #31-1 site.

INTEGRATED WEED MANAGEMENT PLANS FOR HIGH-PRIORITY WEED SPECIES

Scientific name: *Carduus nutans*_____
Common name: Musk thistle _____
Date _April 24, 2015_____ Updated _____

A. PRIORITY __B Listed__

B. DESCRIPTION

• First-year rosettes are usually large and compact with a large taproot that is hollow near the crown
• Second year adults grow one or more stems from the base which become highly branched above
• Leaves are alternate with leaf margins and midrib often whitish. Scotch leaves extend down the stem giving it a winged appearance.
• Purple flowers appear in the second season, 1-2 in. wide. Musk flowers nod when mature and are solitary on stems with pinecone-like prickly bracts below.
• Reproduce only by seed (up to 20,000 seeds per plant)

C. CURRENT DISTRIBUTION ON THE PROPERTY

See Figure 1 Weed Management Map.

D. DAMAGE & THREATS

• Highly competitive: invades disturbed areas, pastures, rangelands, forests and croplands throughout most of the United States
• Impacts agricultural production
• Infestations reduce or eliminate wildlife use

E. WEED MANAGEMENT OBJECTIVE

Infestation area will be graded. Site to be planted

F. MANAGEMENT OPTIONS

Viable control options are:
(1) **Chemical Control** (always add non-ionic surfactant @ 1 oz for each 3 gallons of water) **Stopping flowering and seed production is critical for success. Mowing is ineffective. *Full* Flowering Stage of growth is the worst time to apply herbicides**
(2) **Mechanical**
• Cut tap root one to two inches below ground
• Digging up the entire root or spraying herbicide on the remaining root section is not necessary
Reference: **www.laplataweeds.org** for specific treatment options

INTEGRATED WEED MANAGEMENT PLANS FOR HIGH-PRIORITY WEED SPECIES

Scientific name: *Cynoglossum officinale* _____
Common name: Houndstongue
Date __April 24, 2015_____ **Updated** _____

A. PRIORITY __B Listed ___

B. DESCRIPTION

• Taprooted rosettes form in the first year of a two year growth cycle. A stiff central stem bolts in the second season and produces reddish purple
flowers by early-summer.
• Leaves are oblong to lance-shaped and alternate along the stem, 1-12 in. long, 1-3 in. wide with unique vein patterns
• Mature plants, 1-4 ft. tall, produce velcro-like seeds that readily attach to clothing and animal fur as a method of dispersal
• Reproduces only by seed
• A problem in forests, rangelands and pastures

C. CURRENT DISTRIBUTION ON THE PROPERTY

See Figure 1 Weed Management Map.

D. DAMAGE & THREATS

• Poisonous to grazing animals. If choices are limited or in baled hay fed in winter, animals maybe forced to eat it.
• 2 pounds is a fatal dose
• Reduces agricultural production
• Infestations reduce or eliminate wildlife use

E. WEED MANAGEMENT OBJECTIVE

The infestation area will be regarded. Insure successful re- vegetation with re-seeding – and shrub establishment upon reclamation.

F. MANAGEMENT OPTIONS

Viable control options are:
(1) **Chemical Control** (Always add non-ionic surfactant @ 1 oz for each 3 gallons of water)
(2) **Mechanical Control:**
• **Live plants**: Cut taproot 2 inches below soil
• If seeds are formed, carefully bag and dispose of
• **Old seedy stalks**: Prior years dead plants with hanging seeds can be carefully bagged
• Garden pruning snips, wire cutters or a sharp knife works well for collecting old seed stalks for disposal. Stopping flowering and seed production is critical for success. Mowing is ineffective.
Reference: **www.laplataweeds.org** for specific treatment options

INTEGRATED WEED MANAGEMENT PLANS FOR HIGH-PRIORITY WEED SPECIES

Scientific name: *Cirsium arvense*
Common name: Canada thistle
Date: April 24, 2015 **Updated** _____

A. PRIORITY __B listed___

B. DESCRIPTION

- Rosette present every spring
- Perennial that re-grows each year from a massive, spreading root system 15 ft. deep
- Stem is hollow, erect and covered with fine hairs1-4 ft. tall
- Leaves lance shaped, spine tipped lobes, hairless or fi ne hairs present
- Flowers pink to purple, 1/2-3/4 in. width
- Flowers June through August
- Seeds are 40% viable

C. CURRENT DISTRIBUTION ON THE PROPERTY

See Figure 1 Weed Management Map.

D. DAMAGE & THREATS

Canada thistle has invaded the intermittent channel adjacent to the well pad and surface of the well pad with the infestation areas.

E. WEED MANAGEMENT OBJECTIVE

Application timing for all products:

- Apply in late spring to plants in the pre-bud growth stage or in the fall at frost
- Use higher rates during drought or poor growing conditions

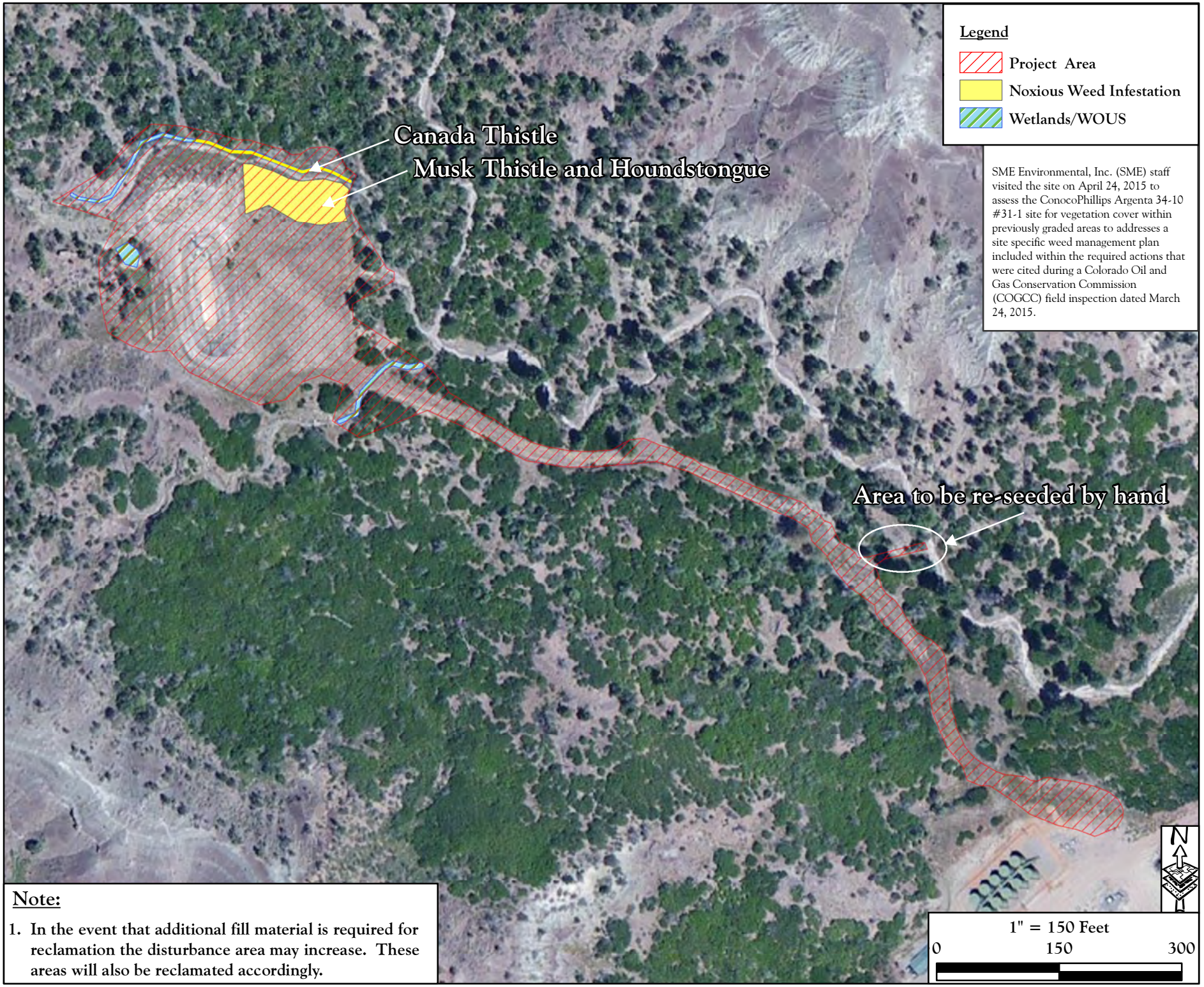
F. MANAGEMENT OPTIONS

Viable control options are:

(1) **Chemical Control** (always add non-ionic surfactant @1 oz for each 3 gallons of water)

(2) **Mechanical Control:** Mowing at bud stage of growth twice during the growing season followed by fall applied herbicides on full re-growth is the best management practice. **Mowing alone is ineffective. Roto tilling, discing and plowing increases density and is ineffective**

Reference: **www.laplataweeds.org** for specific treatment options



Note:

1. In the event that additional fill material is required for reclamation the disturbance area may increase. These areas will also be reclamated accordingly.

ENVIRONMENTAL CONSULTANTS
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WEED LOCATION MAP
WEED MANAGEMENT PLAN
ARGENTA 34-10 #31-1 RECLAMATION

Date:	7/20/2015
Pro #:	1500020
Name:	Figure 1.0
Scale:	1" = 150'

Source: (c) 2014 ESRI ArcGIS Online.

1.0

ATTACHMENT A

La Plata County Weed Management and Enforcement Plan

Annex B
La Plata County Weed Management and Enforcement Plan
Pursuant to Article II of Chapter 58 of the La Plata County Code and
the Colorado Noxious Weed Act

PART 1
GENERAL PROVISIONS

Sec. 101. Title.

This Plan shall be known and referred to as the "La Plata County Weed Management and Enforcement Plan" and shall be effective throughout the unincorporated areas of La Plata County.

Sec. 102. Definitions.

See Sec. 58-31 of the La Plata County Code.

Sec. 103 Introduction.

A. The provisions of this plan relate to the Colorado General Assembly's findings that noxious weeds have become a threat to the natural resources of Colorado and that an organized and coordinated effort must be made to stop the spread of noxious weeds.

B. This plan represents a coordinated effort of the Weed Office and the Advisory Commission to develop and oversee a comprehensive management plan for the control of noxious weeds in La Plata County.

C. This plan further recognizes that because the spread of noxious weeds can largely be attributed to the movement of seed and plant parts on motor vehicles and noxious weeds are becoming an increasing maintenance problem on highway right-of-ways in the state, local cooperative efforts have been undertaken to proceed with noxious weed management.

D. This plan is designed in accordance with the statutory provisions of the Colorado Noxious Weed Act. The provisions of this plan do not interpret, apply, or incorporate any provisions of the Colorado Pest Control District Act, codified at C.R.S. § 35-5-101, et seq.

Sec. 104. Objectives and Goals of the La Plata County Weed Office.

A. Education**.**

(1) Educate the public on the state mandated weed law (the Colorado Noxious Weed Act) and the state's mandate that La Plata County act to manage, and sometimes to eradicate, certain noxious weeds so designated by the Department.

(2) Raise public awareness that noxious weeds disrupt intended land use and degrade the environment.

(3) Raise public awareness that the county has limited funds with which to control noxious weeds.

(4) Assist landowners and private enterprise in preparing integrated weed management plans.

(5) Educate and make the public aware of the State of Colorado A, B and C weed species, and additional weeds designated for management by the BOCC.

B. Mapping.

(1) Continue mapping of noxious weeds countywide and compiling of information in cooperation with other agencies.

(2) Management and Buffering Strategies: All landowners and land managers with county listed weed species will be required to implement the following management strategies:

(a) Infestations of one acre or less:

(i) Isolated small populations: Intensive best management practices applied with eradication goals in mind. Prevent seed formation and root spread on an annual basis.

(ii) Satellite populations proximate to larger populations: Intensive best management practices applied with eradication, containment, and reduction goals in mind. Prevent seed formation and root spread on an annual basis.

(b) Larger populations of more than one acre:

(i) Using effective, best management practices, apply containment and perimeter buffering management practices at a minimum of fifty feet wide each growing season. Prevent seed formation and root spread on an annual basis.

(ii) Continue weed management in the year-one fifty-foot buffer zone. Perimeter buffering management practices shall be stepped inward toward the center of the infestation at a minimum of fifty feet wide each season thereafter until the desired goals of the weed management plan have been met.

(c) Priority Management Areas:

(i) Infestations adjacent to property lines, easements, rights-of-way, ditches, canals, streams, rivers, trails, wildlife migration routes and private and public roadways: Buffering will be required each growing season and applied to the entire perimeter of the infestation at a minimum of fifty feet wide at the proper timing in order to prevent seed formation and root spread. Annual stepped in buffering and reduction management shall be required.

C. Support of private enterprise.

(1) It is the intent of the BOCC not to compete with private enterprise.

(2) Encourage an expansion in services by existing commercially licensed applicators.

(3) Encourage the development of new weed management businesses.

D. Environment. Environmental quality shall always remain a high priority of the La Plata County Weed Management Plan.

Sec. 105. Management Plan.

A. Program of integrated management.

(1) It is the intent of the BOCC to implement a coordinated program of integrated management (hereinafter sometimes referred to as "IM"). The purpose of integrated management is to achieve healthy and productive natural and agricultural ecosystems through a balanced program. This program will include, but not be limited to, education, prevention measures, good stewardship and control methods.

(2) Integrated management is a strategy using a comprehensive, interdisciplinary approach to plant management. By viewing a problem in its entirety, one is better able to design a management plan that is safe, cost effective and gets results, without unreasonable damage to natural controls and the environment. An IM approach to weed management includes choosing from a variety of available weed control strategies and predicting their long term effects.

(3) The major weed control tactics to be considered in an IM program are:

(a) Education should be considered the number one priority (e.g., plant identification, life cycles, mapping infestations).

(b) Prevention (e.g., eliminate undesirable plant seed dispersal, irrigation management, soil fertility and range management).

(c) Mechanical and physical (e.g., cutting, mowing, burning, cultivation and cross fencing).

(d) Cultural (e.g., crop rotation, establishment of competitive crops and mulching).

(e) Biological (e.g., grazing, predators, parasites and pathogens).

(f) Chemical (e.g., weed oils, nonselective and selective herbicides, and plant growth regulators).

While these tactics can be used singularly, they are usually most effective when used in combination. Once it is determined why the weeds are occurring in the first place, strategies can be developed not only to reduce existing weed populations and change the size of infestations, but also to prevent future weed problems.

B. The A, B and C Weed Lists and Management Plans annexed hereto and made a part hereof as Attachments A through G shall be utilized in the administration of the Management Plan pursuant to Chapter 58 of the La Plata County Code.

Sec. 106. Education.

A. Education must be the first step in the plan. It must be an ongoing process, ever changing and utilizing all available resources.

B. Colorado State University Cooperative Extension (sometimes hereinafter referred to as "Cooperative Extension") will partner with the BOCC and the La Plata County Undesirable Plant and Rodent Advisory Commission in communicating to the public broad, efficient, and cost effective weed management programs.

C. The role of Cooperative Extension in the management of noxious weeds will be that of education. Cooperative Extension will help people identify and understand their needs and problems in regard to noxious weed management and will provide practical solutions to these problems using research-based information and new technology.

D. The objective of the Advisory Commission in partnership with Cooperative Extension and other governmental agencies will be to provide the community with the necessary educational and technical assistance required to implement this plan.

E. The overall goal of Cooperative Extension will be to provide a forum, on a continuous basis, for the education process to occur. Activities may include, but not be limited to, the following:

(1) Newsletters on a timely basis providing research based information;

(2) Workshops and educational seminars in weed management techniques;

(3) Communication with the local press and the placement of new technology articles and releases on weed management;

(4) Advising individual producers on developing weed management plans;

(5) Private pesticide certification workshops;

(6) Development and implementation of test plots demonstrating effective weed management techniques and recommendations;

(7) Identification of noxious weeds;

F. Cooperative Extension will report to the BOCC and the Advisory Commission on an annual basis, as to activities in the educational arena for weed management.

Sec. 107. Implementation.

The Weed Office through its officers and agents, will:

A. Assist Cooperative Extension with public awareness and education programs.

B. Comply with laws governing pest application and licensing and follow label directions.

C. Maintain a current list of designated noxious weeds for the state.

D. Maintain a reference library of related materials for management of designated and noxious weeds.

E. Strive to obtain, complete and update a set of maps showing designated weed infestations within the county.

F. Assist county property owners and managers in preparation of weed management plans. Each individual undesirable plant management plan should be an integrated plan utilizing all effective tools. A plan must be sustainable and financially sound. The plan should provide both short term control, containment, reduction strategies and long term management and monitoring activities. It will take an active concentrated effort by all landowners in the county to bring weeds under control and allow intended land utilization. Cooperation will be the key to the success of this plan.

G. Develop a set of standards and guidelines outlining steps to be taken in the preparation of these plans.

H. Prepare a complete set of standard operating procedures detailing how recommendations for individual management plans will be prepared. The Weed Manager will also set a time table for response after learning of a suspected noxious weed infestation. These steps are:

(1) Request for inspection or observation from right-of-way;

(2) Notification of inspection;

(3) Inspection;

(4) Notification of infestation and control recommendation;

(5) Approve or cooperate with landowner to prepare management plan or wait for management plan from arbitration panel;

(6) Supervise plan as necessary;

(7) Inspect results of control measures;

(8) Submit invoices for all enforcement work;

(9) Certify any unpaid assessments with the county treasurer to be added to tax roles; and

(10) Submit any unpaid invoices for the state board, department or agency to the controller.

I. Maintain an adequate set of records showing purchases, inventory application and billing of chemicals.

J. Prepare a five-year plan of work to be reviewed annually.

K. Prepare an annual plan of work in conjunction with yearly budget request.

L. Supervise the application of weed control on county property and rights-of-way within the county.

M. Report to the BOCC and the La Plata County Undesirable Plant and Rodent Advisory Commission on an annual basis.

Sec. 108 Prevention measures.

A. The first priority is to prevent the introduction of any noxious weed to any area not previously infested.

B. The most obvious method is to stop transporting viable seed or propagating plant parts by mechanical means. All equipment should be cleaned when leaving all infested areas to prevent contaminating rights-of-way and the next area entered.

C. Along these lines, it is strongly recommended that everyone use noxious weed-free certified seed. Feed containing viable noxious weed seeds should not be purchased, transported, or used: Since designated weeds will set seed prior to normal harvest dates, crops need to be treated if they are to be moved from the infested area.

D. Also to be considered is once seed has reached maturity, it can remain viable for years. During this time, it can re-infest the same area long after the weed problem appears to have been solved, or it can be transported to other areas. This can occur naturally by wind and water or mechanically by movement of vehicles or equipment. Seeds are also transported great distances by domestic animals and wildlife.

E. Many of the most common weed problems occur in response to disturbed soils. Disturbances can result from a number of conditions including overgrazed pastures, overused turf, clear cut woodlands, pipeline construction and energy/gravel development, improperly maintained road edges, and land development. Land management practices that minimize soil disturbance are invaluable in prevention and control of undesirable plant species.

Sec. 109. Mechanical control.

Mechanical control includes cultivation, mowing, hand pulling and burning. All of these measures, when used correctly, can be of great help when used in conjunction with another type of control. When used alone, they rarely have a positive long-range effect due to the excellent survival ability of noxious weeds. It may, in fact, make the problem worse through spreading seed or plant parts and by eliminating the desirable competitive species on site.

Sec. 110. Biological control.

A. Biological control is the control of undesirable plants through the use of living organisms. The organism may be an insect, plant, pathogen or livestock, such as sheep, goats or cattle.

B. Recent programs have shown livestock to be very valuable in controlling many weed species. This is especially true in instances of large infestations and in environmentally sensitive areas. When moving livestock from such an infested area for biological control, care should be taken to prevent transportation of seeds to a clean area. If possible, when applicable, livestock should be quarantined for five days to allow all seed to pass through the digestive track. Seed may also need to be sterilized or removed from the animals' hair or wool.

C. Several varieties of insects which can be used on various plants are commercially available. They may be purchased by individuals to be used as part of an integrated plan. This type of control is still in its infancy. It is being researched and directed by the Colorado Department of Agriculture Insectary in Palisade, Colorado. Ideally, insects will provide an economical and environmentally safe control method. However, there are certain problems associated with this type of control. First, there is a limited supply of all species and purchasing insects may require a large initial investment. The compatibility of herbicides and insects is not well known. Also, participation in this project may preclude the use of certain types of control, which would allow infestations to multiply and set seed. To prevent this, land operators must prepare an integrated plan to effectively control these infestations. Research indicates insects may be a valuable control method to be used in integrated pest management plans in the future.

Sec. 111. Chemical control.

A. All chemical application must be done according to the label for each individual product.

B. The choice of chemicals and application rates that are used should be the least environmentally damaging as determined by information currently available. This determination may come first from the recommendations in the Colorado Pesticide Guide from Colorado State University Cooperative Extension. It may also be tempered by the wishes of land owners and the experience of trained personnel associated with the program.

C. While chemicals are a powerful tool, it must be realized that they are just a tool and must be used only as a part of an integrated management plan.

D. The focus of this plan is excerpted from the Colorado Weed Management Act, C.R.S. § 35-5.5-101 et seq., and is on file in the clerk and recorder's office.

Sec. 112. Forms.

Forms annexed hereto and made a part hereof as Attachments G through M shall be utilized in the administration of the La Plata County Weed Management Plan pursuant to Chapter 58 of the La Plata County Code.

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ATTACHMENT A

La Plata County Weed Management Priority Plan, November. 2006, July 2010

A Weed List:

State "A" Listed Weeds: All populations of State A List species are designated for eradication. State A List species must be eradicated in accordance with all the provisions of the applicable state noxious weed management plans. **Bold font name** indicates the species is in La Plata County from previous surveys.

La Plata County Goal 1 Weeds:
The following weeds are designated for eradication in La Plata County as Goal 1 weeds. They are listed as follows (18 species):

African rue (*Peganum harmala*)
Camelthorn (*Alhagi pseudalhagi*)
Common crupina (*Crupina vulgaris*)
Cypress spurge (*Euphorbia cyparissias*)
Dyer's woad (*Isatis tinctoria*)
Giant salvinia (*Salvinia molesta*)
Hydrilla (*Hydrilla verticillata*)
Meadow knapweed (*Centaurea pratensis*)
Mediterranean sage (*Salvia aethiopis*)
Medusahead (*Taeniatherum caput-medusae*)
Myrtle spurge (*Euphorbia myrsinites*)
Orange hawkweed (*Hieracium aurantiacum*)
Purple loosestrife (*Lythrum salicaria*)
Rush skeletonweed (*Chondrilla juncea*)
Sericea lespedeza (*Lespedeza cuneata*)
Squarrose knapweed (*Centaurea virgata*)
Tansy ragwort (*Senecio jacobaea*)
Yellow starthistle (*Centaurea solstitialis*)

B Weed List:

State "B" Listed Weeds: The following State B List Species are designated by the Commissioner for eradication or management wherever they are found. State B List species must be eradicated or managed in accordance with all the provisions of the applicable state noxious weed management plans.

Until a state noxious weed management plan for a particular species is developed and implemented by rule, all persons are recommended to manage that species pursuant to consultation with the Weed Office or pursuant to the management plan developed by the weed office and attached hereto.

Size and Location:
All landowners and land managers with mandatory for eradication or management B List Weed Species will be required to implement the following minimal management strategies.

Isolated small populations of one acre** or less (goal 1): Intensive best management practices applied with eradication goals in mind. Prevent seed formation and root spread on an annual basis.

Satellite populations ,one acre or less, (goal 1) proximate to larger populations (goal 2): Intensive best management practices applied with eradication goals in mind. Prevent seed formation and root spread on an annual basis.

Large populations of more than one acre (goal 2): Use effective, best management practices. At a minimum, apply containment and perimeter buffering management of fifty feet wide each growing season. Prevent seed formation and root spread on an annual basis.

Containment and perimeter buffering/ reduction practices shall be stepped inward toward the center of the infestation at a minimum of fifty feet wide each season thereafter until the desired goals of the weed management plan have been met. Weed re-growth in previous buffers shall continue to be managed to prevent seed formation and root spread on an annual basis.

Priority Management Areas:

Infestations adjacent to property lines, easements, rights of ways, ditches, canals, streams, rivers, trails, wildlife migration routes, private and public roadways: Buffering will be required each growing season and applied to the entire perimeter of the infestation at a minimum of fifty feet wide at the proper timing in order to prevent seed formation and root spread. Annual stepped in buffering and reduction management will be required.

Weeds that are underlined for the species name indicates required (mandatory) management by the State of Colorado in La Plata County. **Bold font name** indicates the species is in La Plata County from previous surveys.

Weed Name & Scientific Name

Absinth wormwood (*Artemisia absinthium*)
Black henbane (*Hyoscyamus niger*)
Bouncingbet (*Saponaria officinalis*)
Bull thistle (*Cirsium vulgare*)
Canada thistle (*Cirsium arvense*)
Chinese clematis (*Clematis orientalis*)
Common tansy (*Tanacetum vulgare*)
Common teasel (*Dipsacus fullonum*)
Corn chamomile (*Anthemis arvensis*)
Cutleaf teasel (*Dipsacus laciniatus*)
Dalmatian toadflax(*Linaria dalmatica*)
Dalmatian toadflax (*Linaria genistifolia*)
Dames rocket (*Hesperis matronalis*)
Diffuse knapweed (*Centaurea diffusa*)
Eurasian watermilfoil (*Myriophyllum spicatum*)
Hoary cress (*Cardaria draba*)
Houndstongue (*Cynoglossum officinale*)
Jointed Goatgrass (*Aegilops cylindrical*)
Leafy spurge (*Euphorbia esula*)
Mayweed chamomile (*Anthemis cotula*)

Weed Name & Scientific Name

Moth mullein (*Verbascum blattoria*)
Musk thistle (*Carduus nutans*)
Oxeye daisy (*Chrysanthemum leucanthemum*)
Perennial pepperweed (*Lepidium latifolium*)
Plumeless thistle (*Carduus acanthoides*)
Quackgrass (*Elytrigia repens*)
Russian knapweed (*Acroptilon repens*)
Russian olive (*Elaeagnus angustifolia*)
Salt cedar (*Tamarix Chinensis, T. parvifloria, and T. ramosisima*)
Scentless chamomile (*Matricaria perforate*)
Scotch thistle (*Onopordum acanthium*)
Scotch thistle (*Onopordum tauricum*)
Spotted knapweed (*Centaurea maculosa*)
Spurred anoda (*Anoda cristata*)
Sulfur cinquefoil (*Potentilla recta*)
Venice mallow (*Hibiscus trionum*)
Wild caraway (*Carum carvi*)
Yellow nutsedge (*Cyperus esculentus*)
Yellow toadflax (*Linaria vulgaris*)

State B List Addition: **Jointed goatgrass** (*Aegilops cylindrical*) moved from C List.
State B List Deletion: **Redstem filaree** (*Erodium cicutarium*) moved to State C List.

C Weed List:

The following weeds are designated for recommended and voluntary management until at such time they may be designated as mandatory in La Plata County.

State "C" Listed Weeds: All populations of State C List species are designated for recommended and voluntary management until a time they are designated as mandatory. **Bold font** indicates the species is in La Plata County from previous surveys.
They are listed as follows (14 species):

Chicory (*Cichorium intybus*)
Common burdock (*Arctium minus*)
Common mullein (*Verbascum thapsus*)
Common St. Johnswort (*Hypericum perforatum*)
Downy brome (*Bromus tectorum*)
Field bindweed (*Convolvulus arvensis*)
Halogeton (*Halogeton glomeratus*)
Johnsongrass (*Sorghum halepense*)
Perennial sowthistle (*Sonchus arvensis*)
Poison hemlock (*Conium maculatum*)
Puncturevine (*Tribulus terrestris*)
Redstem filaree (*Erodium cicutarium*)
Velvetleaf (*Abutilon theophrasti*)
Wild proso millet (*Panicum miliaceum*)

Importation and Cultivation of A, B, and C listed weeds:

Persons are prohibited from importing seeds, propagated plant parts or live plants and cultivating the A, B and C listed weed species (or others in this document) in La Plata County and the State of Colorado. All listed species are non-native and problematic in La Plata County, Colorado, other States or other North American regions.

Notes:

ATTACHMENT B

La Plata County Weed Distribution, _____. 2006

Distribution in La Plata County

Distributions of selected noxious weed species in La Plata County, Colorado as of _____ are listed below. Weeds classified as "(Not Listed)" are currently not on the State of Colorado lists, however they have proven to be aggressive and negatively impact agricultural and natural ecosystems in other counties, states and North American regions. "Absent" means not yet found in La Plata County.

Section I and II species are not yet found in La Plata County. Once they are discovered, they should be promptly and intensively managed toward eradication goals. Monitoring and re-treatment will be critical so as not to allow establishment and spread.

I. Absent, Simple Rooted:

~Common crupina (Crupina vulgaris) annual, A list*, NKI=Central Idaho
Common teasel (Dipsacus fullonum) biennial, B list NKI= Garfield, Boulder Counties
Cutleaf teasel (Dipsacus laciniatus) biennial, B list, in CO
Corn chamomile (Anthemis arvensis L.) annual, B list, in CO
~Dyer's woad (Isatis tinctoria) winter annual, biennial, short lived perennial, A list, NKI= Dove Creek, CO & Utah
Mayweed chamomile (Anthemis cotula L.) (ill-smelling, dog fennel) annual, B list, CO
~Medusahead (Taeniatherum caput-medusae) winter annual, A List*, NKI=Utah
Moth mullein (Verbascum blattaria) biennial, B list, in CO
~Squarrose knapweed (Centaurea virgata) tap rooted perennial, A list*NKI=Montezuma County and Juab County, Utah
Viper's bugloss (Echium vulgare) tap rooted biennial (NOT LISTED), in CO
~Yellow starthistle (Centaurea solstitialis) annual, A list, NKI=Montrose/Ouray County line.

II. Absent, Complex or Deep Rooted:

~African rue (Peganum harmala) perennial, A list*, NKI=San Juan County, NM
~Camelthorn (Alhagi pseudalhagi) perennial, A list*? NKI=San Juan River below Bluff, Utah.
~Chinese climatis (Clematis orientalis) perennial, B list, NKI=Alamosa, CO
Common bugloss (Anchusa officinalis) deep taprooted, biennial/perennial (NOT LISTED), Boulder County, CO
Common St. Johnswort (Hypericum perforatum) C list, perennial, in CO
Common tansy (Tanacetum vulgare L.) perennial, B list, escaped ornamental, in CO
Eurasian watermilfoil (Myriophyllum spicatum) aquatic plant, B list, in CO
Giant salvinia (Salvinia molesta) aquatic plant, A list*, Texas and AZ
Hydrilla (Hydrilla verticillata) aquatic plant, A list*, Texas and AZ
Japanese knotweed, Mexican Bamboo (Polygonum cuspidatum) perennial shrub, (NOT LISTED), in CO
Meadow knapweed (Centaurea pratensis) perennial, A list, NKI=Elk River, N. of Steamboat Springs, CO
Orange hawkweed (Hieracium aurantiacum L.) perennial, A list, NKI=Crested Butte, CO & N. central Idaho
Purple loosestrife (Lythrum salicaria) perennial, riparian plant A list, NKI=San Miguel River, W. Montrose County
Rush skeletonweed (Chondrilla juncea) perennial, A list*, in ID, MT, WA, OR, CA
Sericea lespedeza (Lespedeza cuneata) perennial, A list*, NKI=SW Kansas
Tree of heaven (Ailanthus altissima) perennial, woody species (NOT LISTED), in CO
Yellow hawkweed (Hieracium pratense Tausch.) perennial, (NOT LISTED) NKI= Central Idaho, Wyoming. May be starting in central Colorado.
Yellow nutsedge (Cyperus esculentus), creeping perennial, B list, in CO

Sections III and IV species are currently small and manageable populations in La Plata County and should be promptly and intensively managed towards eradication. Monitoring and re-treatment will be critical to not allow establishment and spread

III. Rare Populations, Simple Rooted:

Absinth wormwood (Artemisia absinthium) perennial, B list

Dame's rocket (Hesperis matronalis) biennial or perennial, B list
Mediterranean sage (Salvia aethiopis) biennial, escaped garden ornamental, A list
Plumeless thistle (Carduus acanthoides L.) biennial, B list, NKI= one small patch, N. end Vallecito Lake believed to be eradicated 2005
Scentless chamomile, (Matricaria perforata) annual, B list,
Diffuse knapweed (Centaurea diffusa Lam.) annual, biennial or short-lived perennial, B list,
Black henbane (Hyoscyamus niger L.) annual or biennial, B list,
Tansy ragwort (Senecio jacobaea) taprooted biennial or short lived perennial, A list, NKI= Southern CR 311 area

IV. Rare Populations, Complex or Deep Rooted:
Bouncingbet (saponaria officinalis L.) perennial, B list, in
Cypress spurge (Euphorbia cyparissias) perennial, escaped garden ornamental, A list
Dalmatian toadflax (Lineria dalmatica) Broad-leaved, perennial, B list
Dalmatian toadflax (Lineria genistifolia) Narrow-leaved, perennial, B list
Myrtle spurge (Euphorbia myrsinites*)* perennial, escaped garden ornamental, A list
Perennial Pepperweed Tall whitetop (Lepidium latifolium L.) perennial, B list, NKI=Animas Valley, N. of Riverbend St.
Sulfur cinquefoil (Potentilla recta L.) perennial, B list, NKI= CR 518 Ignacio

Sections V and VI species are established in La Plata County and should be managed with containment, buffering and reduction practices in order to stop their continued spread.

V. Common and Established, Simple Rooted:
Bull thistle, (Cirsium vulgare) biennial, B list
Chicory (Cichorium intybus) tap rooted perennial, C list (NOT COUNTY COST SHARED)
Common mullein (Verbascum thapsus) biennial, C list (NOT COUNTY COST SHARED)
Curley dock (Rumex crispus) perennial, (NOT STATE LISTED, NOT COUNTY COST SHARED)
Houndstongue (Cynoglossum officinale) biennial, B list
Musk thistle (Carduus nutans) biennial, B list
Scotch thistle (Onopordum acanthium) biennial, B list
Scotch thistle (Onopordum tauricum) biennial, B list
Spotted knapweed (Centaurea Maculosa), short lived perennial (3-5 yrs), B list

VI. Common and Established, Complex or Deep Rooted:
Canada thistle (Cirsium arvense) perennial, B list
Hoary cress, Whitetop, (Cardaria draba) perennial, B list
Leafy spurge (Euphorbia esula) perennial, B list
Oxeye daisy (Chrysantheum leucanthemum L.) perennial, B list
Russian knapweed (Centurea Maculosa) perennial, B list
Russian olive (Elaeagnus angustifolia) perennial, woody species, B list
Salt cedar,Tamarisk (Tamarix ramosissima Ledeb.) perennial shrub, B list
Yellow toadflax (Linara Vulgaris Mill.), perennial, B list

Notes:
~ Tilde symbol indicates current mandatory management by the State of Colorado.
A, B, or C list indicates current State of Colorado Listing
*** Not believed to be found in Colorado as of this time**
****One Acre is approximately 209 feet by 209 feet and is 43,560 square feet in area**
NKI = Nearest known infestation
New invading species qualifies for county cost share once discovered

ATTACHMENT C

Biennial Thistle Management by Rod Cook
La Plata County Weed Office
www.lpcweeds.org
April 2006

Background of Biennial Thistle Invasion:
Bull, Musk, Plumeless and Scotch, (biennial thistles) are indicator plants. They indicate that recent or historic disturbances have occurred in an area. Common disturbances that promote biennial thistle invasion are: land that was tilled or farmed and perennial grasses were not established once the farming discontinued, heavy equipment construction, prairie dog colonies, pocket gophers, continuous grazing practices, soil compaction from animals, vehicles or heavy equipment, intense fire, drought, insufficient irrigation and soil nutrients to support the requirements of a healthy perennial grass community.

Biennial thistles live only two years. The first year they form a rosette germinating from seed. Plants over-winter in this rosette stage and the second year bolt in early May, to become a flowering adult. In the second year after flowering and going to seed, they die. These are shallow, tap-rooted plants that spread only by seed and not by underground root systems. Seed longevity in the soil can be several years. Preventing flowering and seed formation will stop seeds from being deposited, and is one of the initial steps in reclaiming an area.

Biennial thistles get established and are allowed to spread due to lack of a healthy vegetative cover. They grow where there are spaces in the vegetative cover. Where grass plants are dense and healthy, you will not find robust thistle infestations. Consequently, past, present and future land and vegetation uses need to be scrutinized and modified to promote optimum grass plant health. References: CSU Fact Sheets, Grass Growth and Response to Grazing:
http://www.ext.colostate.edu/PUBS/NATRES/06108.html and:
Managing Small Acreage Pastures During and After Drought:
http://www.ext.colostate.edu/PUBS/NATRES/06112.html

Once biennial thistles have been managed and the causes that allowed them to invade have been addressed, then rehabilitation with perennial grass plants appropriate for the area is imperative to prevent re-invasion. If desirable perennial grasses are competing with thistles in a common area, grasses can be released from competition by the use of a selective, broad-leaved herbicide appropriate for the site. Be sure to check the herbicide label for this information. Herbicide labels can be found on-line at: http://www.cdms.net

Management Options:
Cultural control. Maintaining pastures and rangeland in good condition is a primary factor for biennial thistle management. To favor pasture and rangeland grass growth, do not overgraze. Fertilize when necessary and according to soil testing recommendations. To successfully manage biennial thistles, prevent flowering and seed formation. Cultural methods that favor desirable plant growth can be combined with chemical or biological control by superimposing proper grazing management and seeding.
Mechanical control. Biennial thistles will not tolerate tillage. The site needs to be evaluated for the density and condition of existing grasses in the infestation, if any. Tillage can be used however, it is expensive and it will take grasses a minimum of 5 years to attain sufficient density on non-irrigated ground. Biennial thistle can be removed easily by severing its root one or two inches below ground with a shovel or hoe. It is not necessary to dig up the entire root or flip the

sod plug over. The least amount of disturbance you create, the better. Mowing can reduce seed output if plants are cut when the terminal head is in the late-flowering stage, however mowing can be fatal to biological control insects present in flower heads. Mowing will not kill the plants and will not stop basal flowering and all seed production.

Burning alone will not control thistles long term. Burning off old skeletons from previous years, followed by an appropriate herbicide can be effective since burning can help germinate seeds in the area. Always consider the risk to your property and your neighbors when considering a planned burn. Before burning always contact your local fire department for burn restriction information and enlist their assistance. Keep in mind that burning can negatively impact biological controls that already may be established on site.

Harvesting and disposing of individual flower heads can be time intensive and is generally not worth the effort. One needs to survey for the presence of the seed head weevil and consider that you will be disposing of beneficial insects in a landfill.

Chemical control. Always use the 3 R method, right growth stage treatment timing, right product and right rate per acre. From the tables below, note that lower rates work on spring and fall rosette stages of growth, which saves you money. Many herbicides are registered in pasture, rangeland and non-crop areas to control biennial thistle. Be sure to read and follow all label restrictions. Avoid the purchase and use of diluted garden shop variety herbicides. Non-ionic surfactants designed for use with herbicides should always be in the tank mix at .25% (one fourth of one percent) of the entire tank volume. Surfactants help herbicides get past waxy or hairy plant defenses. Once the plant absorbs the herbicide, it cannot be washed off by rain after a couple of hours post application.

Spring Rosette Growth Stage (before bolting): This is one of the best management practices.
2,4-D Amine: 1.5 to 2 qts per acre
Redeem R&P: 1 pt per acre
Milestone: 3 to 5 oz per acre
Curtail: 2 qts per acre
2,4-D Amine: 1 qt + Tordon ½ to 3/4 pt per acre (not to be used in flood/sub irrigated, seasonal flood plain, in or up slope of tree root zones)
Escort: ¼ to ½ oz per acre
Telar: ½ to 1 oz per acre (non-crop areas only)

Bolted growth stage (bolting occurs generally first week of May in La Plata County):
2,4-D (not effective or recommended at this growth stage)
Redeem R&P: 1.5 pts per acre
Milestone: 3 to 5 oz per acre
Curtail: 3 qts per acre
2,4-D Amine: 1 qt + Tordon 3/4 to 1 pt per acre (not to be used in flood/sub irrigated, seasonal flood plain, in or up slope of tree root zones)
Escort: ½ oz per acre
Telar: ½ to 1 oz per acre (non-crop areas only)

Prebud growth stage:
2,4-D: (not effective or recommended at this growth stage)
Redeem R & P: 2 pts per acre
Milestone: 3 to 5 oz per acre
Curtail: 4 qts per acre

Escort: ½ to 1 oz per acre
Telar: ½ to 1 oz per acre (non-crop areas only)

Full Flowering Stage of growth is the worst time to apply herbicides.

Fall after Frost Rosette Growth Stage: Apply generally when cottonwood tree leaves are turning yellow in the river valleys or mid September to mid October. This is one of the best management practices.
2,4-D LV 4: 1 to 2 qts per acre
Redeem R&P: 1 pt per acre
Milestone: 3 to 5 oz per acre
Curtail: 2 qts per acre
Tordon: ½ to 3/4 pt per acre (not to be used in flood/sub irrigated, seasonal flood plain, in or up slope of tree root zones)
Escort: ¼ to ½ oz per acre
Telar: ½ to 1 oz per acre (non-crop areas only)
Cool temperatures (below 50 degrees F), particularly in fall, may adversely affect 2,4-D control of biennial thistle; therefore, favor the use of 2,4-D in spring. Apply 2,4-D Amine before musk thistle bolts in spring or seed production will still occur.
Tordon, Redeem, Milestone, Escort and Telar are largely unaffected by cool temperatures. Use Telar in non-crop areas only and Escort in pastures, rangeland or non-crop areas. Research from Colorado State University and the University of Nebraska shows that Telar or Escort prevents or dramatically reduces viable seed formation when applied in spring, up to early flower growth stages. The latest time to apply these herbicides is when developed terminal flowers have opened up to the size of a dime. The same is true of Redeem, Milestone and Curtail.
Biological control. The Musk and Plumeless thistle seed head weevil, *Rhinocyllus conicus*, can be found throughout Colorado. The female deposits her eggs on the back of developing flowers and covers them with chewed leaf tissue. After eggs hatch, larvae bore into the flower and destroy developing seeds. The seed head weevil reduces seed production by 50 percent on the average. If used alone, however, it is not an effective management tool. The use of herbicides in spring or fall rosette stage does not interfere with the seed head weevil's life cycle. This allows the weevils to complete their life cycle and ensures their presence in subsequent growing seasons. The use of herbicides during summer full flowering stage is discouraged. Diluted herbicide solutions are not toxic to these insects, however surfactants in the tank mix can suffocate them if they get sprayed.
The Colorado Department of Agriculture has established another weevil, *Trichosirocalus horridus*. This weevil attacks the crown area of Musk and Plumeless thistle rosettes and kills or weakens the plant before it bolts. This weevil is being distributed throughout Colorado by the Department of Agriculture. It tends to be more effective than the seed head weevil.
The thistle-defoliating beetle *Cassida rubiginosa*, causes some damage to foliage. Many biologicals are available on the market today, but before buying you should inquire for unbiased research or references as to their effectiveness. Biological controls generally do not eradicate weed populations due to the fact that insects will not eat themselves out of house and home. Sometimes it takes decades for biologicals to get established and see visible results. If they do get established, then most times reduction in vigor and seed production may be realized.
Integrating Control Methods
A good management system integrates at least two or more methods of control into a plan of operation. To combine chemical and biological control methods, apply herbicides when they won't interfere with insect development and allow the control insects to complete their life cycle. One step that is easily overlooked is follow-up and monitoring. This may be the most important part of a weed management plan, because if you do not keep records of what you did and when

you did it, you will not know what has worked or failed and why. Record keeping is required by the EPA for restricted use herbicides and is recommended in the industry for all herbicides.

Weed management is developing a working plan to implement over time and integrate into your total land management plan. It is different from simple weed control, which reacts to weeds after they occur. Start with making a weed management file, keep accurate records and take beginning and occasional photos as you work your plan. Establish photo points and take pictures from the same angle over time. A chronology of a project captured with photographs can be rewarding in a few years.

ATTACHMENT D

Canada Thistle Management
La Plata County Weed Office
www.lpcweeds.org
April 2006

no. 3.108
Canada Thistle
by K.G. Beck [1]

Quick Facts...

- Canada thistle is a creeping perennial that reproduces from vegetative buds in its root system and from seed.
- It is difficult to control because its extensive root system allows it to recover from control attempts.
- Combining control methods is the best form of Canada thistle management.
- Persistence is imperative so the weed is continually stressed, forcing it to exhaust root nutrient stores and eventually die.

Canada thistle (*Cirsium arvense*) is an aggressive, creeping perennial weed that infests Crops, pastures, rangeland, roadsides and non-crop areas. Generally, infestations start on disturbed ground, including ditch banks, overgrazed pastures, tilled fields or abandoned sites. Canada thistle reduces forage consumption in pastures and rangeland because cattle typically will not graze near infestations.

One plant can colonize an area 3 to 6 feet in diameter in one or two years. Canada thistle grows in a variety of soils and can tolerate up to 2 percent salt content. It is most competitive in deep, well-aerated, productive, cool soils. It usually occurs in 17- to 35-inch annual precipitation zones or where soil moisture is adequate. It is less common in light, dry soils. A survey conducted in 1998 showed Colorado has about 400,000 acres infested with Canada thistle.

Figure 1: Canada thistle (*Cirsium arvense*).

Phenology

Emergence. Canada thistle develops from seed or vegetative buds in its root system. Horizontal roots may extend 15 feet or more and vertical roots may grow 6 to 15 feet deep. Canada thistle emerges from its root system in mid- to late spring (late April through May) and forms rosettes (Figure 1). The greatest flush of root-derived plants occurs in spring, but another flush occurs in fall. A flush can occur anytime during the growing season when soil moisture is adequate. This is particularly a problem when Canada thistle growth is disturbed by tillage or herbicides. This feature can be manipulated to the land manager's advantage.

Plants that germinate from seed do so at about the same time as root-derived shoots. Seedlings grow slowly and are sensitive to competition, particularly if shaded. Canada thistle seedlings develop a perennial habit (the ability to reproduce from their root systems) about seven to eight weeks after germination.

Reproduction and spread. Canada thistle begins to flower in late spring to early summer in response to 14- to 16-hour days. Plants are male or female (dioecious) and grow in circular patches that often are one clone and sex. Female flowers produce a sweet odor and insects readily pollinate different sexed patches up to 200 feet apart. Canada thistle develops seed sparingly. It may produce 1,000 to 1,500 seeds per flowering shoot. Generally, vegetative reproduction from its root system contributes to local spread and seed to long distance dispersal. Seed may be transported long distances by water, or attached to animals, clothing, farm equipment and other vehicles,

and in contaminated crop seed. Also, wind may help disseminate seed, but most often, the feathery pappus breaks off, leaving the seed attached to the parent plant to be disseminated by other means. Seed can remain viable in soil up to 20 years, and deep burial promotes survival longevity.

Canada thistle allocates most of its reproductive energy into vegetative propagation. New shoots and roots can form almost anywhere along the root system of established plants. Tillage segments roots and stimulates new plants to develop. Shoots emerge from root and shoot pieces about 15 days after disturbance by tillage. Small root pieces, 0.25 inch long by 0.125 inch in diameter, have enough stored energy to develop new plants. Also, these small roots can survive at least 100 days without nutrient replenishment from photosynthesis.

Management

The key principle to Canada thistle control is to stress the plant and force it to use stored root nutrients. Canada thistle can recover from almost any stress, including control attempts, because of root nutrient stores. Therefore, returning infested land to a productive state occurs only over time. Success requires a sound management plan implemented over several years.

Cultural control. Grasses and alfalfa can compete effectively with Canada thistle if good management favors their growth. Maintain fertility and, if possible, moisture at optimum levels to favor grass or alfalfa growth. Soil analysis can easily determine fertility needs. Be cautious with nitrogen fertilizers, because excess available soil nitrogen may favor weed growth.

These are essential management steps to ensure optimum desirable plant growth and competition. However, competition alone seldom is effective against Canada thistle.

Chemical control. Read the label, follow directions and use precautions. Research at Colorado State University shows that Tordon 22K (picloram), Curtail (clopyralid plus 2,4-D), Transline (clopyralid), Banvel/Vanquish/Clarity (dicamba), 2,4-D and Telar (chlorsulfuron) are effective against Canada thistle. These herbicides are most effective when combined with cultural and/or mechanical control.

Banvel/Vanquish/Clarity, and 2,4-D may be used on pastures, rangeland and non-crop areas. Tordon, Curtail, Telar and Transline may be applied to non-crop areas only. Colorado State University data indicates that Banvel/Vanquish/Clarity or Telar are effective when combined with 2,4-D as a split-season application.

Apply 2,4-D, 2 quarts per acre (A), in spring when Canada thistle is 10 to 15 inches tall, in pre-bud to early bud growth stages. Re-treat in fall with Banvel/Vanquish/Clarity (2 quarts/A) or Telar (1 ounce/A) to re-growth. Use a surfactant (0.25 percent to 0.5 percent v/v) with Telar for adequate control. Banvel/Vanquish/Clarity also may be applied in early spring at 2 quarts/A when Canada thistle is in the rosette stage. Tordon (1 quart/A) or Tordon plus 2,4-D (1 quart + 1 quart/A) are effective whenever Canada thistle is actively growing. Fall applications are especially effective.

Curtail and Transline are effective when applied in spring after all Canada thistle plants have emerged. Apply Curtail (2 to 3 quarts/A) when the oldest Canada thistle plants are entering the bud growth stage and the youngest are in the rosette to bolting growth stages. Apply Transline (2/3 to 1 pt/A) when Canada thistle is in the rosette to bud growth stages. Transline at 1 pt/A also is effective when applied in fall.

Recent research at Colorado State University shows that the performance of Curtail to control Canada thistle can be improved when preceded by two or three mowings. When Canada thistle infestations occur in situations where root growth would be restricted, such as habitats with high water tables, begin mowing when it is 12 to 15 inches tall. Repeat mowings at about one-month intervals. Apply Curtail at 2 to 3 quarts/A in October or about one month after the third mowing. Follow this regimen for two consecutive years.

New Products (by Rod Cook)

Redeem R&P or Milestone herbicides are new to the market since the publication of this fact sheet and are effective for Canada thistle control. Apply them with a non-ionic surfactant at .25% of your total tank volume. Apply at Bud Stage (pre-flower) or the fall frost timings. The monthly mowing regiment mentioned above combined with a fall treatment of either of these products is effective.

Redeem 3 to 4 pts per acre

Milestone 5 to 7 oz per acre

Mechanical control. Mowing hay meadows can be an effective tool if combined with herbicide treatments. Mowing alone is not effective unless conducted at one-month intervals over several growing seasons. Always combine mowing with cultural and chemical control. Mowing at hay cutting stimulates new Canada thistle shoots to develop from its root system.

In irrigated grass hay meadows, fall herbicide treatments that follow mowing can be an effective management system because more Canada thistle foliage is present after cutting to intercept herbicide. Additionally, root nutrient stores decrease after mowing because the plant draws on them to develop new shoots.

If a Canada thistle infestation exists in a field that will be rotated to alfalfa, control the weed before seeding alfalfa. Alfalfa is an effective competitor only after it is established. It will not adequately establish in a well-developed Canada thistle infestation. A Canada thistle management system can start with crop or grass competition combined with herbicides, with the field rotated to alfalfa when the management plans end.

Biological control. *Ceutorhyncus litura* is a weevil currently used as a biocontrol agent in Colorado. The female lays eggs underneath the Canada thistle leaves in early spring. Larvae bore into the main leaf vein, then down into the plant's crown area. If the population is high enough, plant death can occur, otherwise Canada thistle is stressed and less vigorous.

Ceutorhyncus alone will not effectively control Canada thistle. It must be combined with other methods to be successful. Combine the weevil with cultural techniques that allow for maximum desirable plant competition. Research to combine *Ceutorhyncus* with herbicides or mowing has not been conducted. Research has shown that biological and chemical controls are compatible for musk thistle. This is most likely true for Canada thistle as well. *Ceutorhyncus litura* is available through the Colorado Department of Agriculture.

Urophora cardui is another biocontrol insect available from the Colorado Department of Agriculture. Females lay eggs on apical meristems of developing shoots. Larvae burrow into shoots. Their feeding triggers huge galls to form that stress the plant, perhaps killing it. Galls that form near the terminal meristems (e.g., where flowers develop) keep the weed from flowering and reduce seed set.

ATTACHMENT E

Diffuse and Spotted knapweed Management
La Plata County Weed Office
www.lpcweeds.org
April 2006

no. 3.110

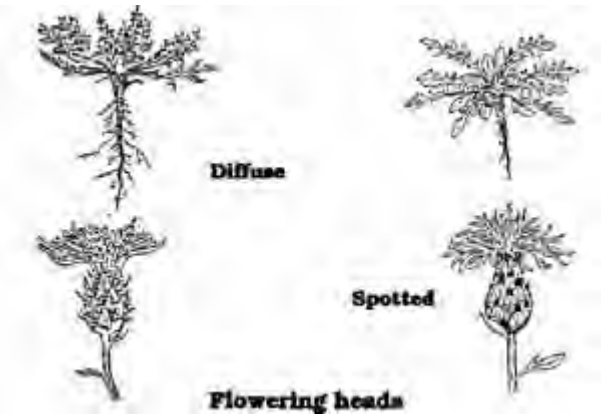
Diffuse and Spotted Knapweed

by K.G. Beck [1]

Quick Facts...

- Diffuse knapweed is a short-lived, non-creeping perennial, a biennial, or occasionally an annual that reproduces and spreads solely from seed.
- Spotted knapweed is a short-lived, non-creeping perennial that reproduces from seed and forms a new shoot each year from a taproot.
- Diffuse and spotted knapweed are readily controlled with herbicides. Unless cultural techniques are used, however, the weeds will reinvade.

Diffuse knapweed (*Centaurea diffusa*) is a short-lived perennial, a biennial, or occasionally an annual. It reproduces and spreads from seed. The plant develops a single shoot (stem) 1 to 2 feet tall that is branched toward the top. Grazed plants may produce multiple stems. Rosette and lower shoot leaves are finely divided. Leaves become smaller toward the top of the shoot and have smooth margins.



Many solitary flowering heads occur on shoot tips. They are about 1/8 inch in diameter and 1/2 to 2/3 inch long. Flowers usually are white but may be purplish. Involucre bracts are divided like teeth on a comb and tipped with a slender spine that makes them sharp to the touch. Sometimes the bracts are dark-tipped or spotted like spotted knapweed. The long terminal spine differentiates diffuse from spotted knapweed.

Spotted knapweed (*Centaurea maculosa*) looks like diffuse knapweed with some notable exceptions. Spotted knapweed is a short-lived, non-creeping perennial that reproduces from seed (primary means of spread) and forms a new shoot each year from a taproot. The weed produces one or more shoots that are branched and 1 to 3 feet tall. Rosette leaves can be 6 inches long and deeply lobed. Leaves are similar to diffuse knapweed. Lavender to purple flowers are solitary on shoot tips and about the same size as diffuse knapweed flowers. Involucre bracts are stiff and black-tipped. The tip and upper bract margin have a soft, spine-like fringe and the center spine is shorter than others.

Phenology, Biology and Occurrence

Diffuse knapweed seeds germinate in spring or fall or anytime during the growing season following a disturbance, if adequate soil moisture is present. Seedlings develop into rosettes and diffuse knapweed remains as a rosette until it grows to a critical size, then it bolts, flowers, and sets seed. It may take from one to several years for diffuse knapweed to reach the critical size necessary to reproduce by seed.

Diffuse knapweed is native to degraded non-cropland (waste places) and seashores from southern Europe to north-central Ukraine. It generally is found on dry, light, porous soils in Europe. Diffuse knapweed appears to occupy similar areas in the United States. Diffuse knapweed will not tolerate flooding or shade and thrives in the semiarid west (generally in 9- to 16-inch precipitation zones). Environmental disturbance (e.g., overgrazed pastures or rangeland, roadsides, rights-of-way, gravel piles, etc.) promotes its invasion.

In Colorado, the worst infestations occur along the Front Range in Larimer, Boulder, Douglas and El Paso

counties. Severe infestations also occur in Archuleta and La Plata counties. A 2002 survey conducted by the Colorado Department of Agriculture found 145,148 infested acres of diffuse knapweed and 1,093 infested acres of spotted knapweed.

Spotted knapweed germinates in spring or fall. Perennial plants resume growth in early spring and bolt at approximately the same time as diffuse knapweed. Flowering occurs through the summer into fall.

Spotted knapweed is native to central Europe, where it is found in light, porous, fertile, well-drained and often calcareous soils in warm areas. It occupies dry meadows, pastureland, stony hills, roadsides, and the sandy or gravelly floodplains of streams and rivers. Spotted knapweed tolerates dry conditions, similar to diffuse knapweed, but survives in higher moisture areas as well (e.g., it thrives in the wetter conditions of the western Montana mountains). Spotted and diffuse knapweed infestations often occur together in Colorado.

Spotted knapweed infestations are not as severe in Colorado as diffuse knapweed. However, this weed spreads rapidly. For example, spotted knapweed was first observed in Gallatin County, Montana, in the 1920s, but is now found in all Montana counties. Today, over 8.5 million acres are infested.

Montana counties where Spotted knapweed was found:

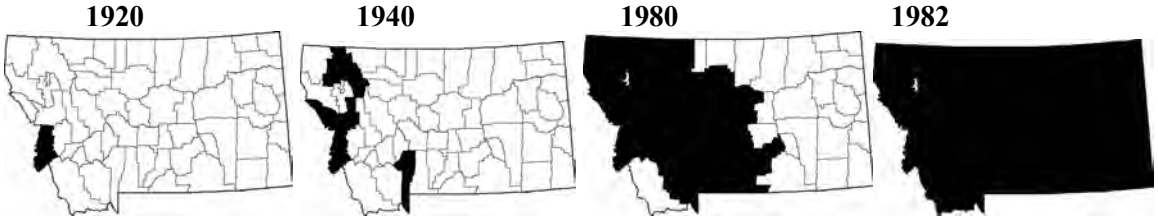


Figure 1. Spotted knapweed was first reported in the western part of Montana in the 1920s. Since then it has spread to every county.

Management

Diffuse and spotted knapweed can be managed similarly. They are readily controlled with herbicides. However, the weeds will reinvade unless cultural techniques are used.

Chemical control. Research conducted at Colorado State University indicates that Tordon 22K (picloram) at 1 to 2 pt/A, Transline (clopyralid) at 0.67 to 1 pt/A, Curtail (clopyralid + 2,4-D) at 4 to 6 pt/A, or Banvel/Vanquish/Clarity (dicamba) at 1 to 2 pt/A control diffuse knapweed. Tank mixes of Banvel/Vanquish/Clarity plus 2,4-D at 1 pt + 2 pt/A or Banvel/Vanquish/Clarity plus Tordon 22K at 1 to 2 pt + 0.5 to 1 pt/A or Tordon plus 2,4-D at 0.75 pt + 2 pt/A all control diffuse knapweed. These tank-mixes may save money and reduce grass injury resulting from higher use rates of a single herbicide.

Spotted knapweed and diffuse knapweed generally occupy the same areas in Colorado, so the same herbicide treatments can be applied. Weed scientists at Montana State University indicate that 1 pt/A of Tordon (0.25 lb) controls spotted knapweed for two to three years, but the weed will reinvade the area unless other management techniques are used.

New Products (by Rod Cook)

Redeem R&P or Milestone herbicides are new to the market since the publication of this fact sheet and are effective for Diffuse and Spotted knapweed control. Apply them with a non-ionic surfactant at .25% of your total tank volume. Treatment should be timed to stop seed production from spring emergence to mid-bolt (no later than bud stage of growth or reduced control may be realized).

Redeem 3 to 4 pts per acre (Spring emergence to mid-bolt and or fall frost)

Milestone 5 to 7 oz per acre (Spring emergence to bud stage and or fall frost)

Cultural control. If desirable grass competition is evident in diffuse or spotted knapweed stands, judicious herbicide application that does not injure grasses may allow them to compete effectively with the weeds. Irrigation (where possible) may help stimulate grass competition in these cases. However, infested rangeland or pastures often are degraded, allowing knapweed invasion, and herbicides alone will not restore the land to a productive state. Seeding suitable perennial grasses is necessary to prevent weed reinvasion.

Biological control. Many insects are being evaluated for biological control of diffuse and spotted knapweeds. Researchers at Montana State University believe it will take a complex of insects (perhaps 12) to reduce diffuse and spotted knapweed populations.

Several insects are available in Colorado, from the Colorado Department of Agriculture. The seedhead flies *Urophora affinis* and *U. quadrifasciata* have been released in many Front Range counties. These insects cause plants to produce fewer viable seeds and abort terminal or lateral flowers.

Root-feeding insects may have a more detrimental effect on knapweed populations than seed-feeding ones. Larvae of the diffuse knapweed root beetle (*Sphenoptera jugoslavica*) feed in the roots of diffuse knapweed.

Larvae of the yellow-winged knapweed moth (*Agapeta zoegana*) feed and the knapweed root weevil (*Cyphocleonus achates*) in the roots of both knapweed species.

Livestock (sheep, goats, cattle) will eat diffuse and spotted knapweed. Recent research completed by Colorado State University shows that cattle grazing diffuse knapweed twice in spring decreased seed set by 50 percent and tumbling off-site over winter by 15 percent. Cattle were managed to achieve 50 percent utilization of pasture and were allowed to graze at two 10-day intervals when diffuse knapweed was bolting and about 6 to 12 inches tall.

Mechanical Control by Rod Cook

Spotted knapweed may produce between 1400 and 2400 seeds per plant with over 90% seed germination rate. Seeds can remain viable for up to 15 years in the soil. Mule deer are fond of grazing Spotted knapweed post seed production and contribute to its rapid spread through their feces.

Spotted and Diffuse knapweed do not tolerate tillage well. When hand pulling or using a shovel or hoe, sever the root at a minimum of 5 inches below soil surface to prevent shoot re-growth. After tillage, seeding and establishment of suitable perennial grasses is necessary to prevent weed reinvasion.

ATTACHMENT F

Spotted knapweed Containment and Eradication Plan for La Plata County for years 2004-2006 (condensed version)

Introduction
Spotted knapweed (Centaurea maculosa) was introduced from Eurasia to North America as a contaminant of alfalfa and clover seed, ranks as the number one weed problem on rangeland in Western Montana. It was first detected there in 1927. It has increased from 2.5 million acres in 1992 to 8.5 million acres in 2005. Because elk do not prefer or utilize Spotted knapweed for food, these large infestations (monocultures) in Montana have forced elk herds to relocate to other drainages for survival. Infestations have been shown to increase soil erosion ten fold over native bunch grasses on Montana rangeland. Spotted knapweed has been shown to spread at the rate of 27% annually on disturbed soils. Spotted knapweed is detrimental to agriculture, range, native plants, fish, wildlife and tourism.

Spotted knapweed has been established in La Plata County for a number of decades. La Plata County has more infested acres than any other county in the State of Colorado (ref. http://www.ag.state.co.us/DPI/weeds/DMPSpottedKnapweed.pdf) Using Montana as an example of what could happen in Colorado has caused great concern among farmers, ranchers, sportsmen, environmentalists and public land managers. The history of Spotted knapweed management in La Plata County, or the lack thereof in some instances, has led us to producing a coordinated effort within La Plata County toward Spotted knapweed management, containment and eradication efforts.

Prioritize Management Areas
Within the county, identify and prioritize management activities along county boundaries, highways, trails, rivers, streams, wildlife migration corridors, areas contiguous to terrain that is difficult to access, public lands and gravel operations.

Grazing and Mowing
These activities do not achieve zero seed production. Animals can move Spotted knapweed seeds off site in digestive tracts and weed seed infested mud on hooves. Studies conducted on mule deer grazing of Spotted knapweed have revealed viable seeds in their feces being transported over several miles. Mowing equipment can transport weed seeds to new areas. For the purposes of this eradication and containment program, grazing and mowing will not be considered acceptable control methods.

Hand Pulling and Shoveling Activities
Hand pulling or shoveling to extract a minimum of five inches of the taproot to prevent re-growth is considered an acceptable control method. These are time intensive and are practical on smaller infestations when soil is moist. In order to obtain zero seed production, hand pulling or shoveling must occur prior to flowering.

Spotted knapweed Management
Refer to Attachment E in this plan or request a copy from the La Plata County Weed Office.

Summary
Long-term commitment, cooperation and support of the community, private citizens, landowners and volunteers will be necessary in order to achieve the goals of Spotted knapweed containment and eradication in La Plata County.

ATTACHMENT G

Spotted Knapweed Management in La Plata County Per 8 CCR 1203-19 Rules Pertaining To the Administration and Enforcement of the Colorado Noxious Weed Act

4.7.4. Spotted knapweed. In addition to the requirements set forth in this Part 4 for the management of all List B species, the following conditions also apply for Spotted knapweed:

A. Elimination of all populations is required prior to seed development in 2006 in all Colorado counties except for La Plata County.

B. Except as otherwise specified in this plan, elimination of all populations in La Plata County must be completed prior to seed development in 2006 for all land outside the boundaries of an area demarcated by State Highway 160 on the north, County Roads 141 and 136 on the east, a line drawn from East to West connecting County Road 136 where it joins State Highway 140 and the La Plata River, the La Plata River on the west from this line to its confluence with Cherry Creek, and Cherry Creek on the west until it meets State Highway 160. For all land within these boundaries, suppression is the specified management objective (see Rule 4.7.6, Figure 8).

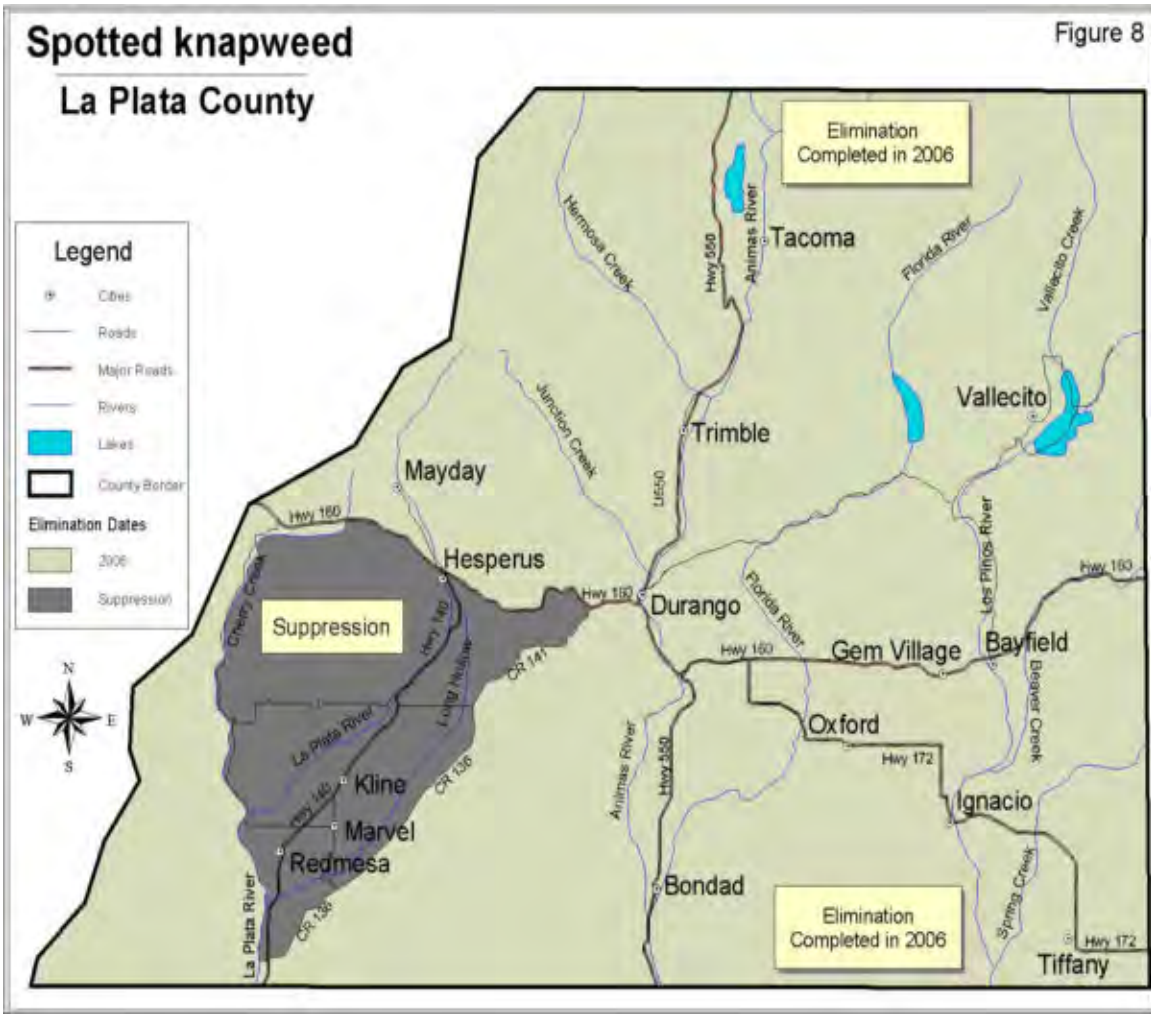
C. All populations in this state that are within 15 feet from the edge of any public road and any immediately adjacent area used for parking must be eliminated prior to seed development in 2005.

D. The prescribed integrated management techniques for the eradication of designated populations are limited to the use of herbicides approved by the Commissioner, and hand pulling, digging, or other mechanical techniques approved by the Commissioner.

E. Prescribed integrated management techniques do not include the use of: (1) any bio-control agents or; (2) any herbicides, cultural techniques, or mechanical techniques other than those approved by the Commissioner.

F. Seed longevity is estimated to be at least fifteen years. Infested sites must be monitored for at least fifteen years after the populations have been eliminated and treatments must be repeated when necessary to prevent flowering and development of seed.

See Figure 8, following page


Spotted knapweed
Figure 8
La Plata County
Legend
Cities
Roads
Major Roads
Rivers
Lakes
County Border
Elimination Dates
2006
Suppression
Suppression
Elimination Completed in 2006
Elimination Completed in 2006
Tacoma
Trimble
Vallecito
Mayday
Hesperus
Durango
Gem Village
Bayfield
Oxford
Ignacio
Kline
Marvel
Redmesa
Bondad
Tiffany
Hermosa Creek
Animas River
Florida River
Vallecito Creek
Junction Creek
Los Pinos River
Beaver Creek
Spring Creek
Cherry Creek
Long Hollow
La Plata River
Hwy 160
Hwy 550
Hwy 140
Hwy 172
CR 141
CR 136
N
S
W
E