STATE OF COLORADO

Gagnon - DNR, Nikie <nikie.gagnon@state.co.us>

Milton Reservoir Dredging

1 message

Rochelle Hoover <Rochelle@erccolorado.net> Wed, Jul 31, 2024 at 11:57 AM
To: Nikie Gagnon <Nikie.Gagnon@state.co.us>
Cc: Lisa Shea <Lisa@erccolorado.net>

Hi Nickie

Thank you for calling me back this morning. Please find attached a description of the operations and engineering dwgs, these attached documents are what was submitted for the CDPHE stormwater permits. On the dwgs are descriptions of the pre-construction, construction, and final site stabilization/restoration. Also, attached are pics of the dredge eqpt and cyclone, and below is basic operations info.

Material: primarily sand - Sand to be sold to O&G companies for fracking

Remaining sediment/solids to be stockpiled or used as fill

Annual amount of material moved: 1,000,000 cy

Daily amount of material processed and stored: Average between 5,000 cy and 6,0000 cy

Equipment onsite: dredge eqpt (see attached pic), excavator, loaders, skidsteer, dump trucks, end dump, water truck, cyclone (see attached pic), pumps, general vehicles (e.g. pickups)

Let me know if you need any additional information and/or have questions. Thank you for your assistance on the mine permit.

Have a good day

shelly

Shelly Hoover, PE

ERC

Ecological Resource Consultants, LLC

12345 W Alameda Pkwy Suite 206 | Lakewood, CO 80228

303-679-4820 x 111

www.erccolorado.net

6 attachments

IMG_7095.JPEG
759K

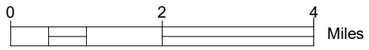
IMG_3901.JPEG
495K

2023.02.14 Milton NNW-Fill Area Work Description.pdf
551K

2021.10.20 MILTON RES SEDIMENT REMOVAL PLANS compressed.pdf
8112K

2022.11.04 MILTON RES SEDIMENT REMOVAL PLANS compressed.pdf
6488K

2023.02.14 MILTON N-FILL Plans compressed.pdf
3228K



Sheet List Table	
Sheet Number	Sheet Title
01	COVER SHEET
02	OVERALL SITE PLAN
03	CROSS SECTION THRU RESERVOIR
04	PLAN 1
05	PLAN 2
06	PLAN 3
07	SEDIMENT & EROSION CONTROL DETAILS

NAD83 Colorado State Planes, North Zone, US Foot

REV	DATE	DESCRIPTION
A	10/20/21	ISSUED FOR REVIEW

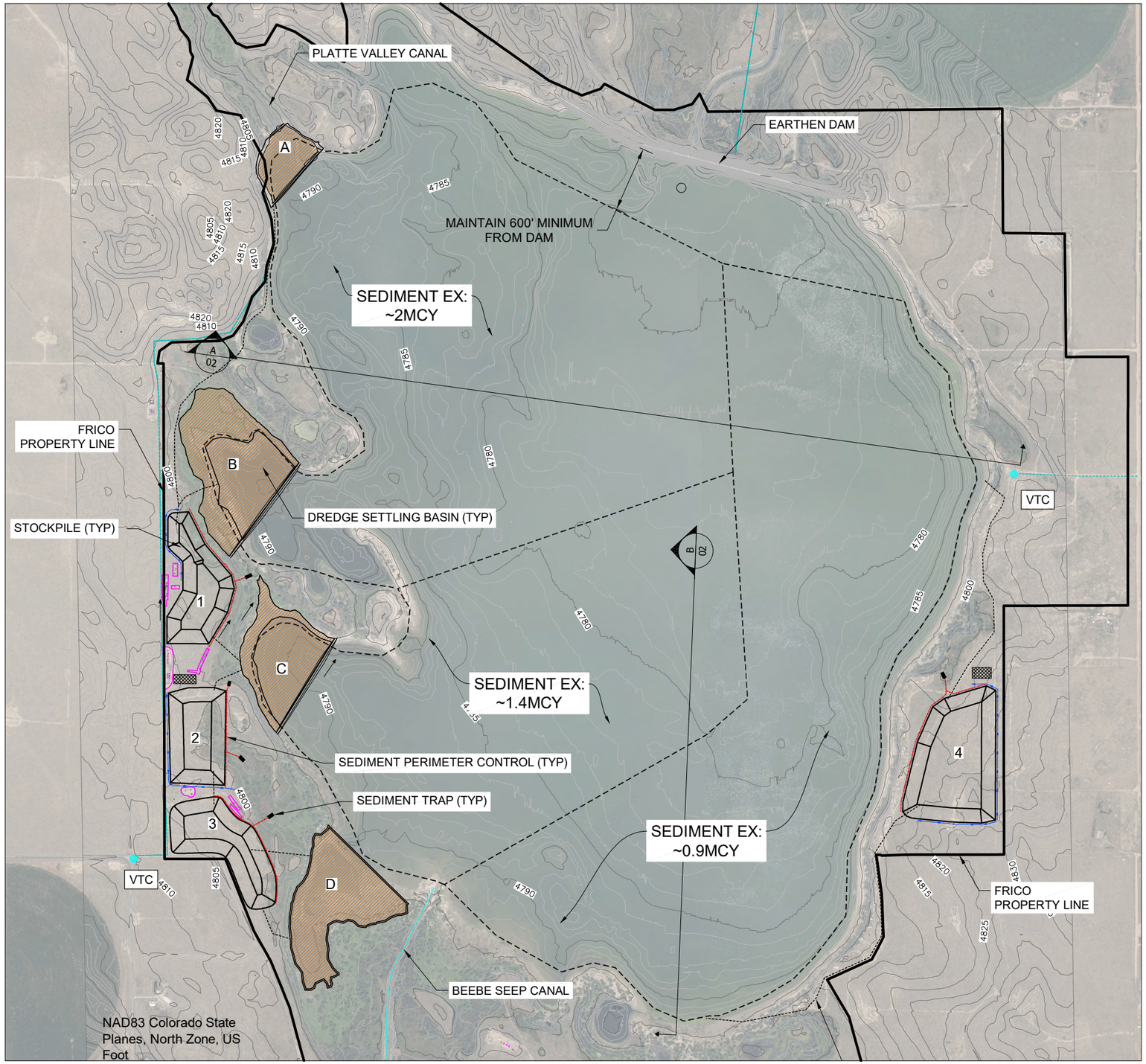
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

CLIENT
FARMERS RESERVOIR & IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
COVER SHEET

SHEET
01



N

0 1200 2400 Feet

DREDGED SETTLING BASIN	VOLUME (CY)
A	80,000
B	270,000
C	196,000
D	187,000
TOTAL	**733,000**

STOCKPILE	VOLUME (CY)
1	715,000
2	715,000
3	712,000
4	1,772,000
TOTAL	**3,914,000**

Phased BMP Implementation

1. Pre-Construction and Site Access Phase includes the installation of vehicle tracking control (VTC), perimeter controls around stockpile locations, and stabilized staging areas (SSA). Perimeter control will consist of installing sediment control logs (SCL) or earthen berms (EB) as needed to intercept stormwater runoff from disturbed areas. If needed, stormwater runoff will be directed to sediment traps (ST) constructed prior flowing into the reservoir.

2. Construction Phase includes modifying the location of sediment control logs/berms as needed to accommodate stockpiles development, applying gravel and/or water to haul roads for dust control, surface roughening, seeding, and mulching.

3. Final Stabilization Phase includes temporary or permanent seeding, erosion control blankets, and removing all temporary BMPs when site has reached final stabilization.

REV	DATE	DESCRIPTION
A	10/20/21	ISSUED FOR REVIEW

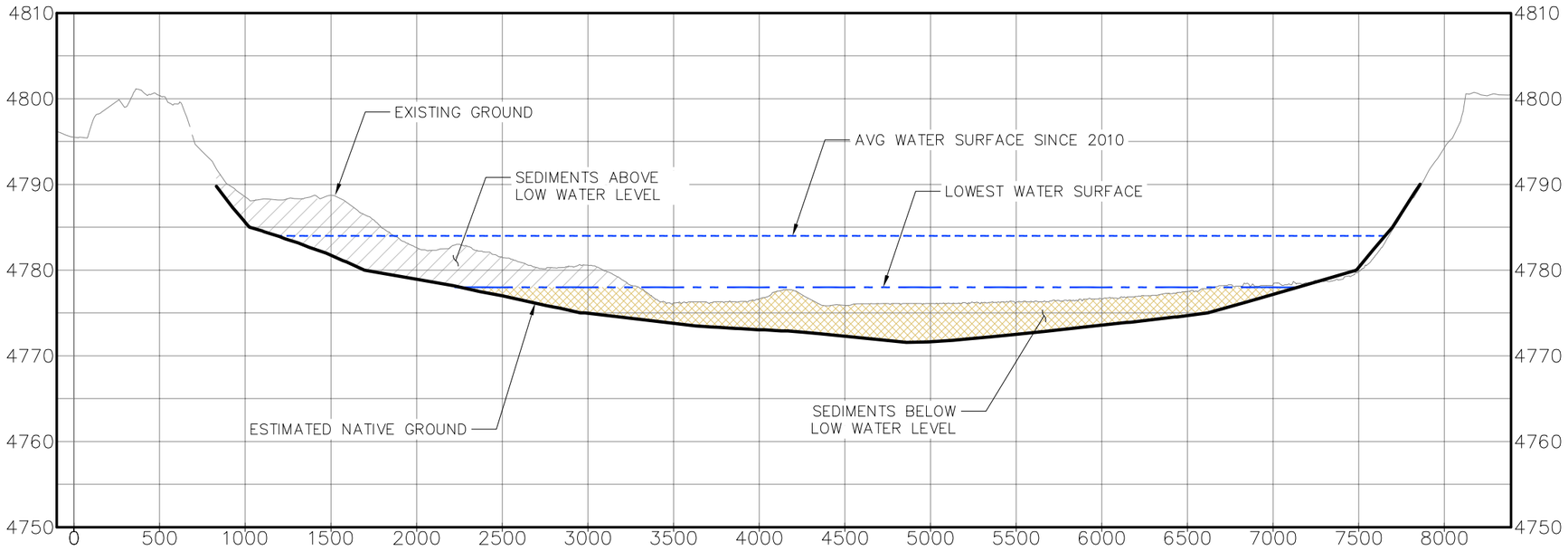
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

CLIENT
FARMERS RESERVOIR & IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
OVERALL SITE PLAN

SHEET
02



A E-W SECTION THRU NORTH PART OF RESERVOIR

VERICAL EXAGGERATION: 50X

A N-S SECTION THRU RESERVOIR

VERICAL EXAGGERATION: 50X

REV	DATE	DESCRIPTION
A	10/20/21	ISSUED FOR REVIEW

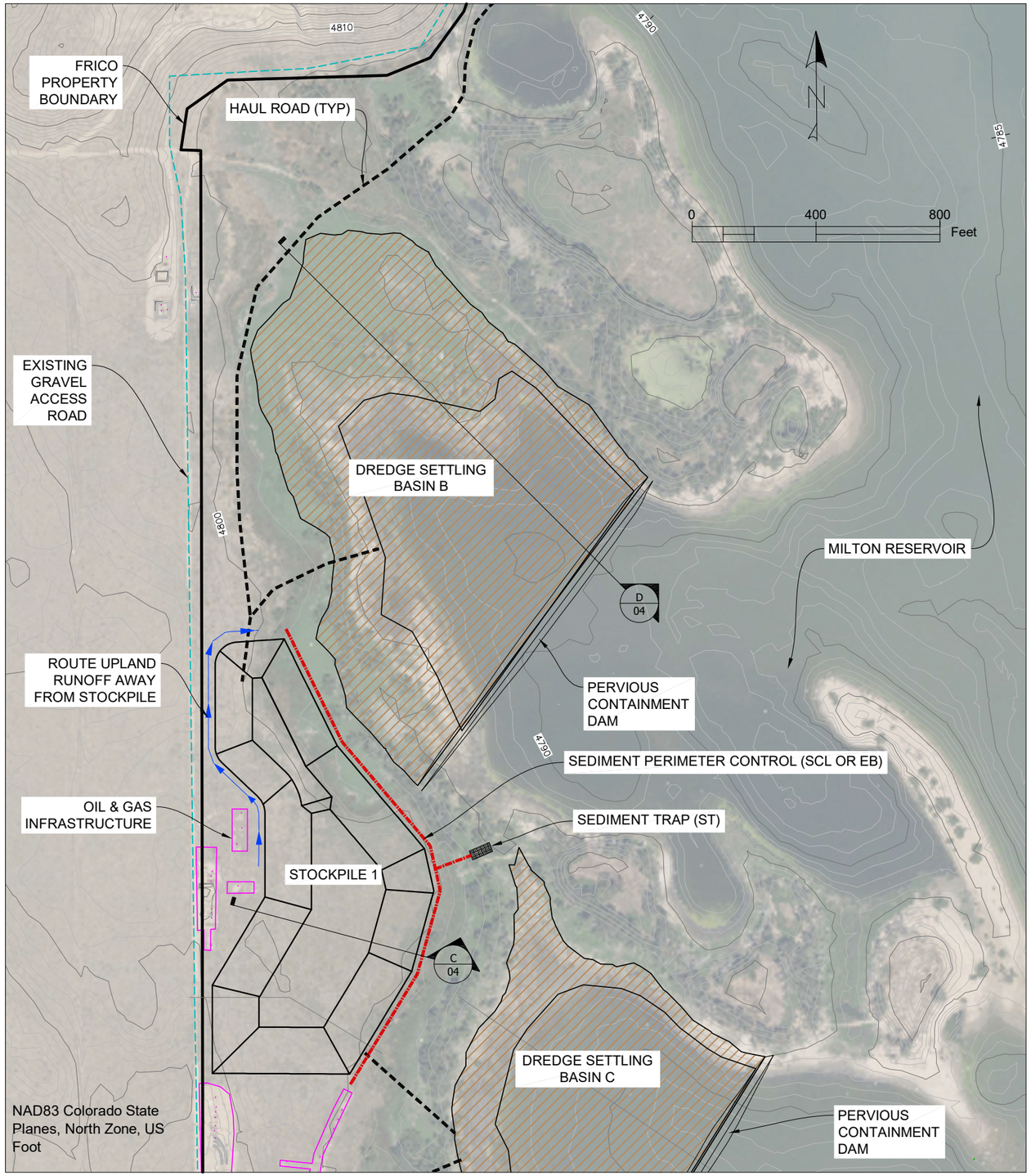
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

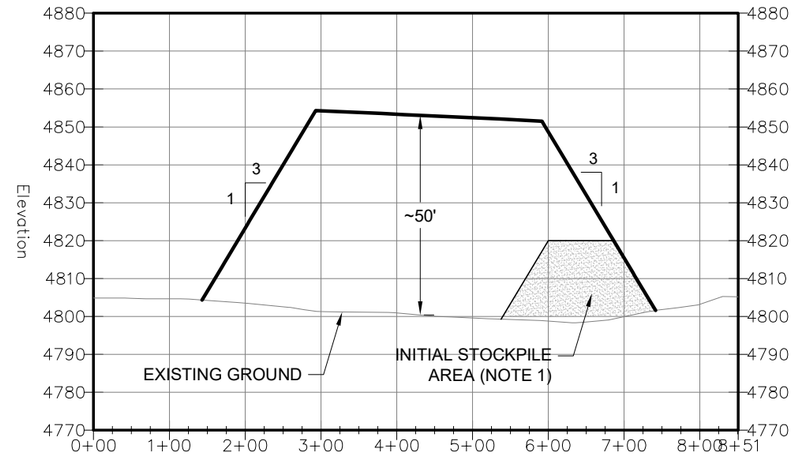
CLIENT
FARMERS RESERVOIR & IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
CROSS SECTION THRU RESERVOIR

SHEET
03



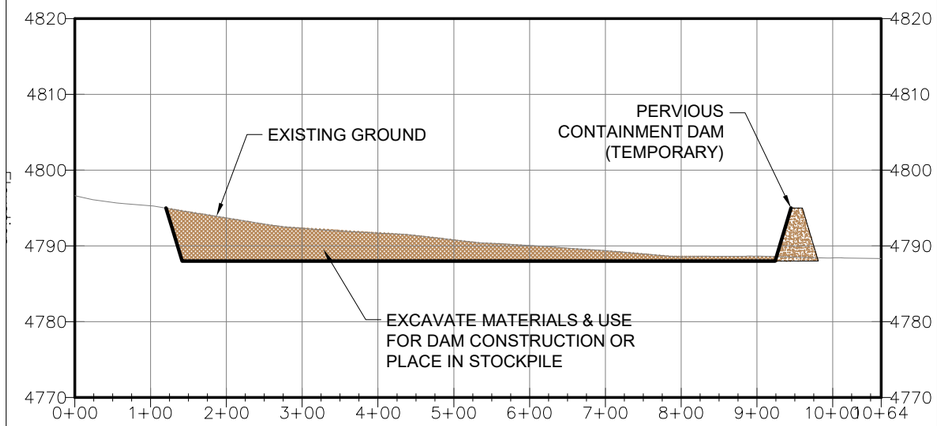


C TYPICAL SECTION THRU STOCKPILE

VERICAL EXAGGERATION: 5X

NOTES:

1. PHASED STOCKPILE DISTURBANCE AREA TO BE MINIMIZED BASED ON ESTIMATED YEARLY SEDIMENT REMOVAL VOLUME.



D TYPICAL SECTION THRU DREDGE SETTING BASIN

VERICAL EXAGGERATION: 5X

REV	DATE	DESCRIPTION
A	10/20/21	ISSUED FOR REVIEW

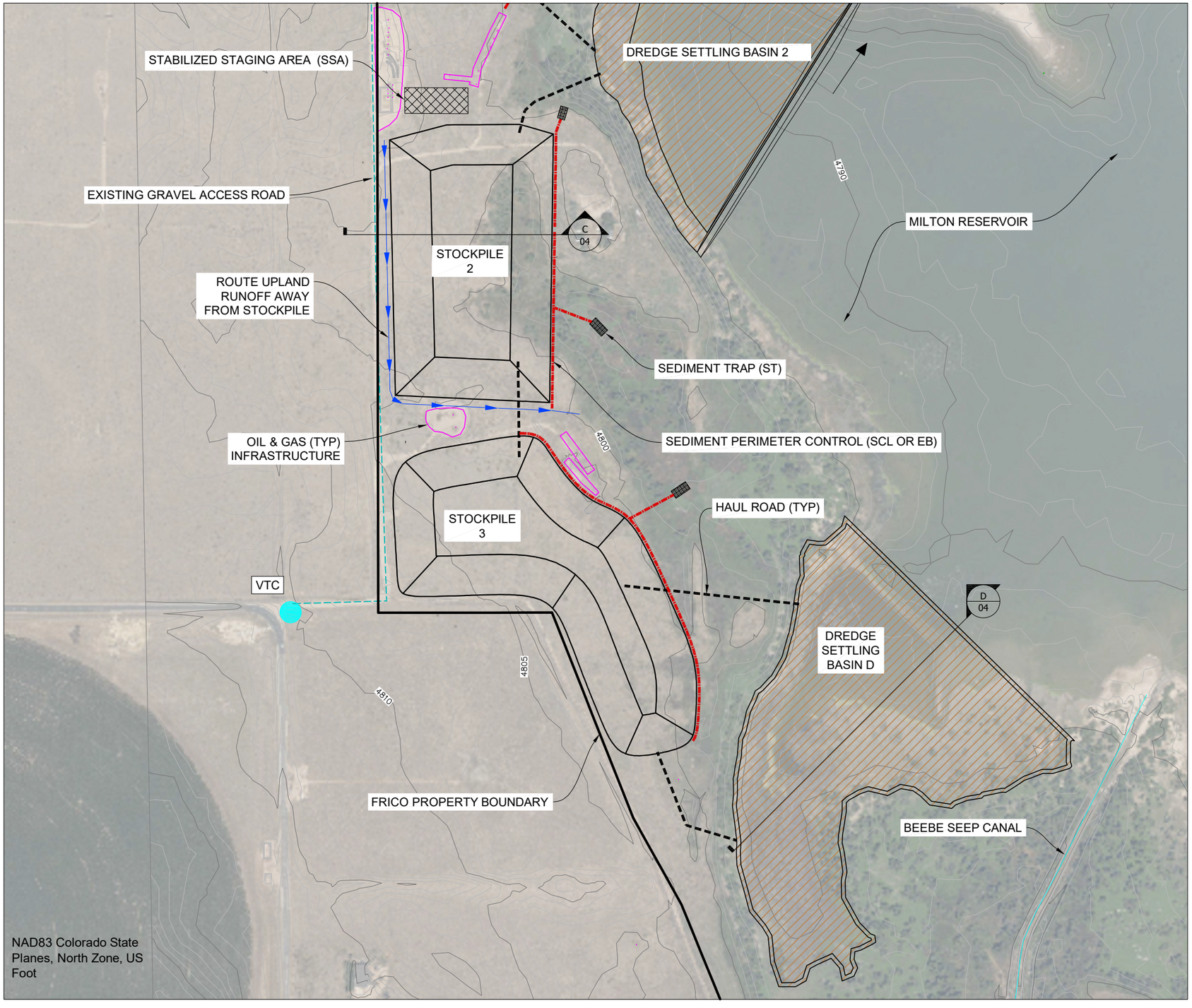
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

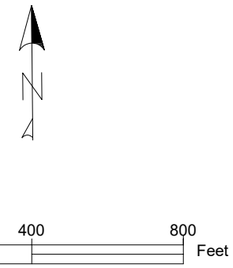
CLIENT
FARMERS RESERVOIR & IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
PLAN 1

SHEET
04





REV	DATE	DESCRIPTION
A	10/20/21	ISSUED FOR REVIEW

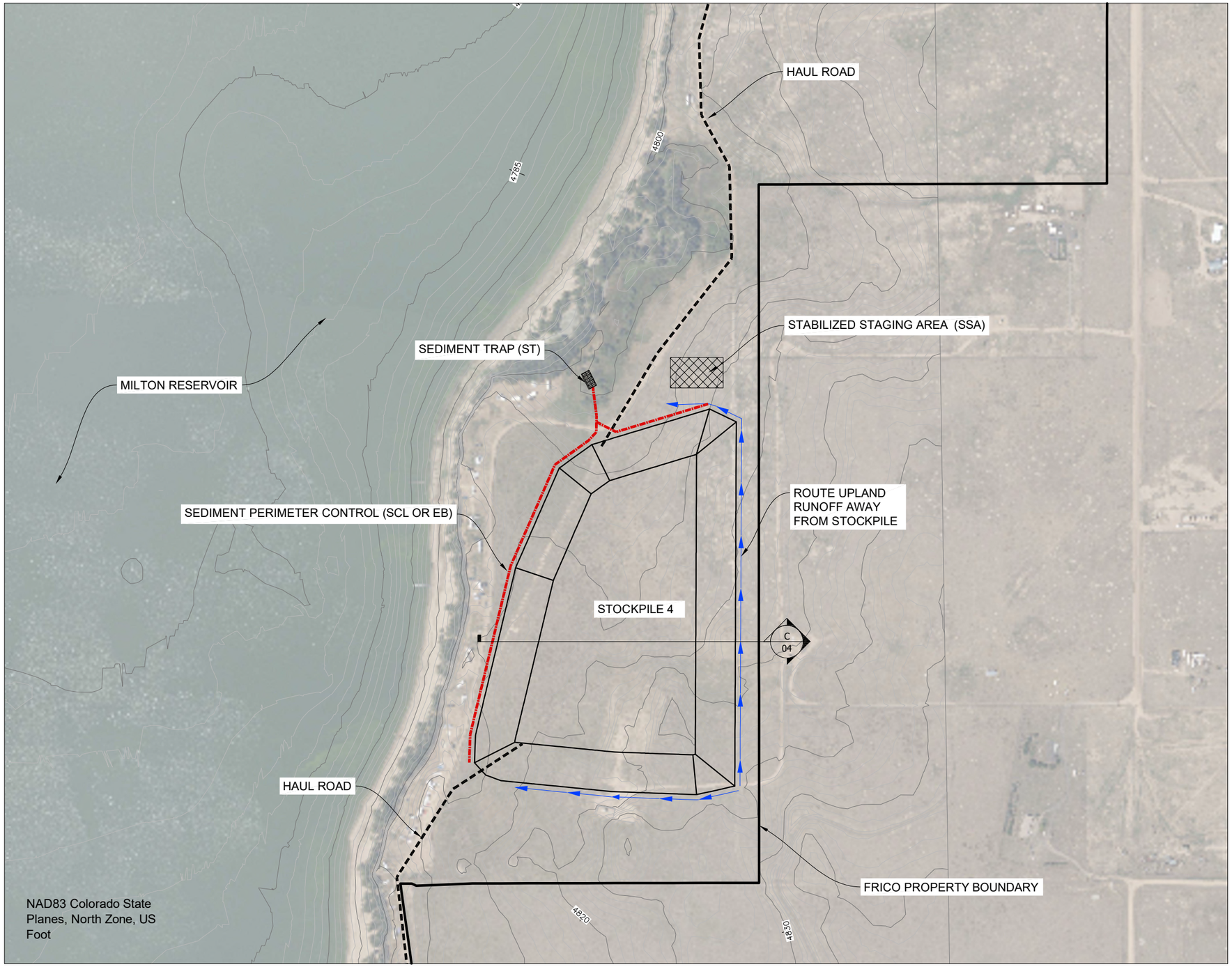
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

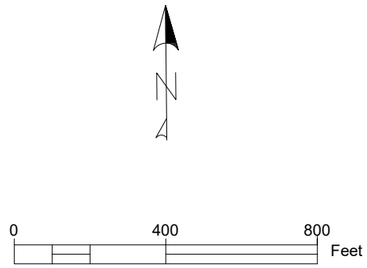
CLIENT
FARMERS RESERVOIR &
IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL
PROJECT

TITLE
PLAN 2

SHEET
05





REV	DATE	DESCRIPTION
A	10/20/21	ISSUED FOR REVIEW

PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

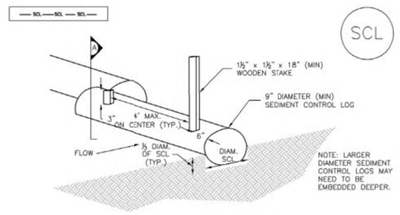
CLIENT
FARMERS RESERVOIR & IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

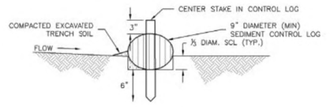
TITLE
PLAN 3

SHEET
06

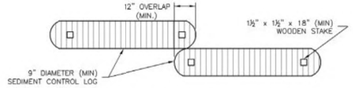
Sediment Control Log (SCL) SC-2



SEDIMENT CONTROL LOG



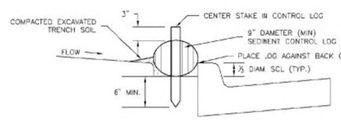
SECTION A



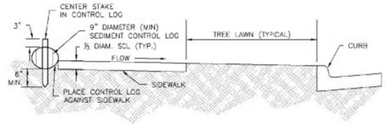
SEDIMENT CONTROL LOG JOINTS

SCL-1. SEDIMENT CONTROL LOG

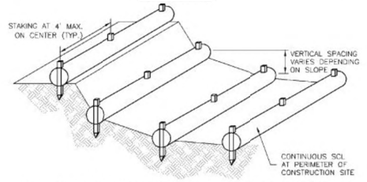
SC-2 Sediment Control Log (SCL)



SCL-2. SEDIMENT CONTROL LOG AT BACK OF CURB



SCL-3. SEDIMENT CONTROL LOG AT SIDEWALK WITH TREE LAWN



SCL-4. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

Sediment Control Log (SCL) SC-2

SEDIMENT CONTROL LOG INSTALLATION NOTES

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

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

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

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

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

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

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

SEDIMENT CONTROL LOG MAINTENANCE NOTES

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

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

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

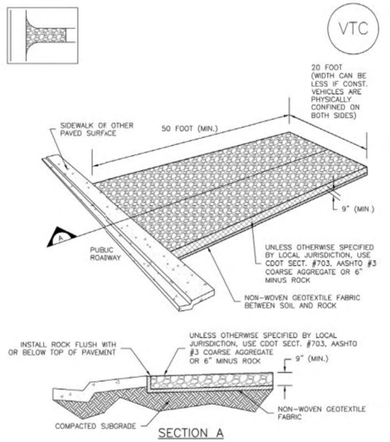
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

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

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

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

Vehicle Tracking Control (VTC) SM-4



SECTION A

VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

SM-4 Vehicle Tracking Control (VTC)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   -TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

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

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

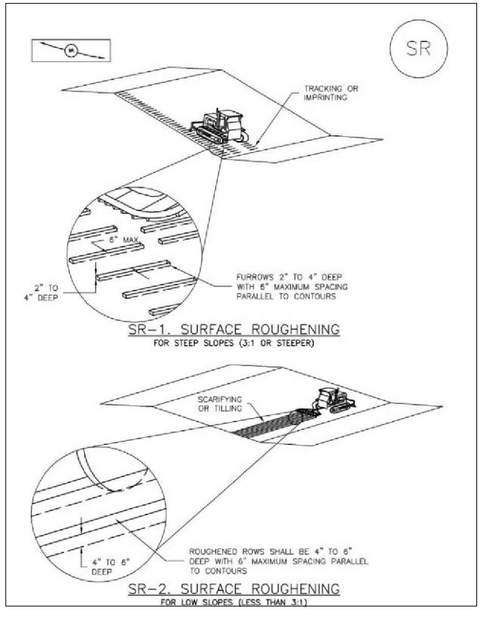
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

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

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)



SR-1. SURFACE ROUGHENING
FOR STEEP SLOPES (3:1 OR STEEPER)

SR-2. SURFACE ROUGHENING
FOR LOW SLOPES (LESS THAN 3:1)

SURFACE ROUGHENING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION(S) OF SURFACE ROUGHENING.

2. SURFACE ROUGHENING SHALL BE PROVIDED PROMPTLY AFTER COMPLETION OF FINISHED GRADING (FOR AREAS NOT RECEIVING TOPSOIL) OR PRIOR TO TOPSOIL PLACEMENT OR ANY FORECASTED RAIN EVENT.

3. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD WILL BE PLACED WITHOUT DELAY IN THE CONSTRUCTION SEQUENCE, SURFACE ROUGHENING IS NOT REQUIRED.

4. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.

5. A FARMING DISK SHALL NOT BE USED FOR SURFACE ROUGHENING.

SURFACE ROUGHENING MAINTENANCE NOTES

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

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

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACE UPON DISCOVERY OF THE FAILURE.

4. VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.

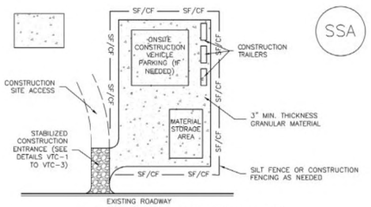
5. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.

6. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER RILL EROSION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

Stabilized Staging Area (SSA) SM-6



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF STAGING AREA(S).
   -CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

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

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

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

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

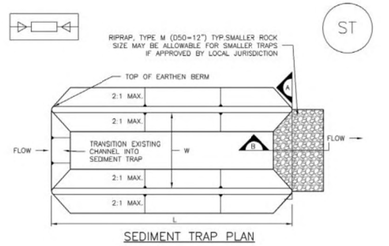
6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

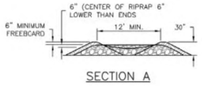
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

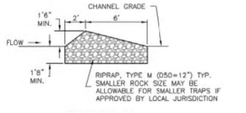
SC-8 Sediment Trap (ST)



SEDIMENT TRAP PLAN



SECTION A



SECTION B

ST-1. SEDIMENT TRAP

Sediment Trap (ST) SC-8

SEDIMENT TRAP INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.

2. ONLY USE FOR DRAINAGE AREAS LESS THAN 1 ACRE.

3. SEDIMENT TRAPS SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

4. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

5. SEDIMENT TRAP OUTLET TO BE CONSTRUCTED OF RIPRAP, TYPE M (D50=12") TYP.SMALLER ROCK SIZE MAY BE ALLOWABLE FOR SMALLER TRAPS IF APPROVED BY LOCAL JURISDICTION.

6. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE RIPRAP OUTLET STRUCTURE.

7. THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL BE A MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

SEDIMENT TRAP MAINTENANCE NOTES

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

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

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

4. REMOVE SEDIMENT ACCUMULATED IN TRAP AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN THE SEDIMENT DEPTH REACHES ½ THE HEIGHT OF THE RIPRAP OUTLET.

5. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT TRAPS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

REV	DATE	DESCRIPTION
A	10/20/21	ISSUED FOR REVIEW

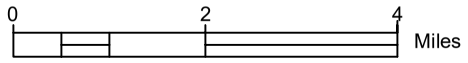
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

CLIENT
FARMERS RESERVOIR & IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
SEDIMENT & EROSION CONTROL DETAILS

SHEET
07



Sheet List Table	
Sheet Number	Sheet Title
01	COVER SHEET
02	OVERALL SITE PLAN
03	PLAN 1
04	PLAN 2
05	SEDIMENT & EROSION CONTROL DETAILS

REV	DATE	DESCRIPTION
A	11/04/22	ISSUED FOR REVIEW

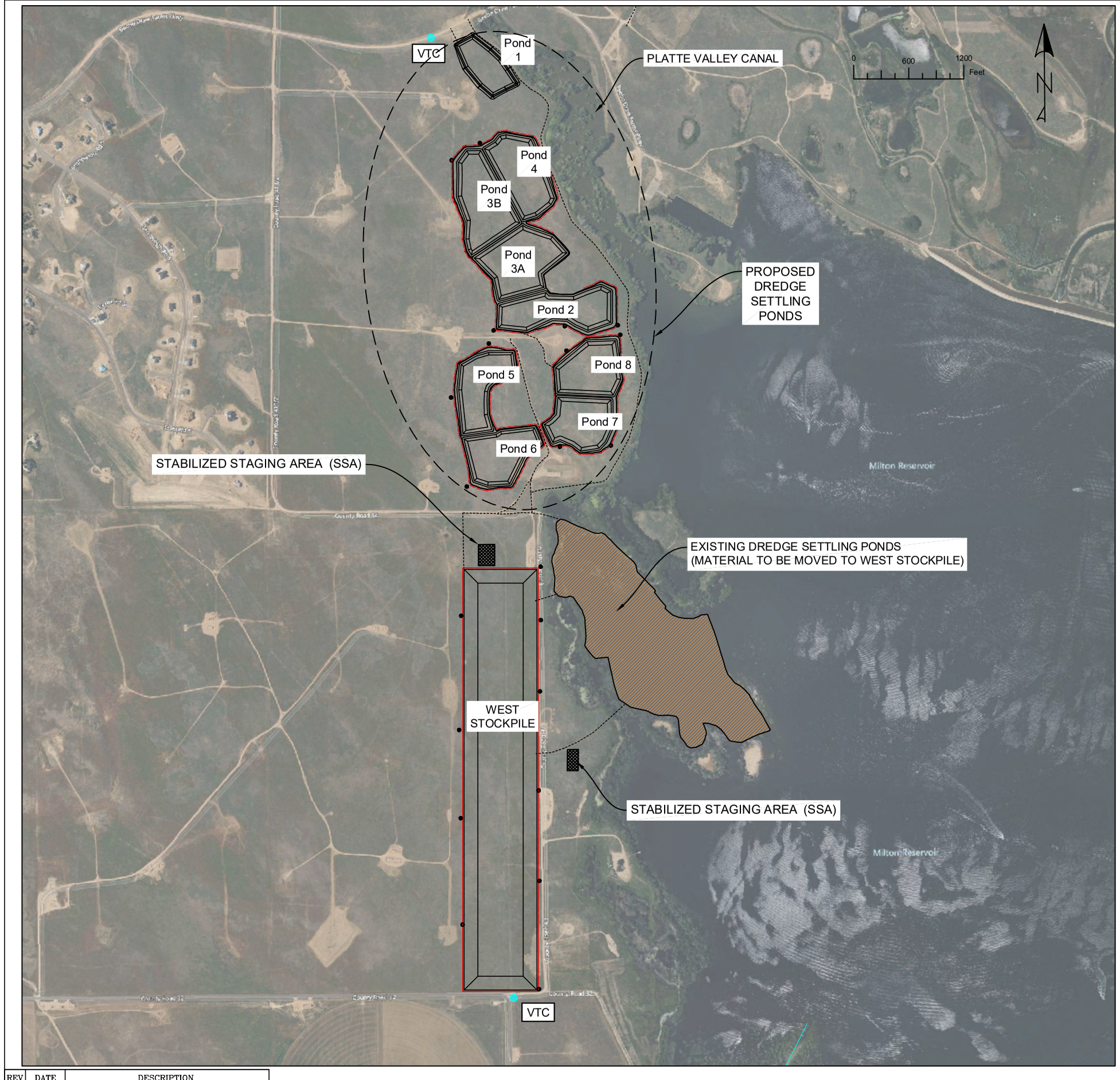
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
COVER SHEET

SHEET
01



LEGEND

- SEDIMENT PERIMETER CONTROL (SCL OR EB)
- HAUL ROAD
- VEHICLE TRACKING CONTROL (VTC)
- STABILIZED STAGING AREA (SSA)
- SEDIMENT COLLECTION AND CLEANOUT BASIN

Phased BMP Implementation

1. Pre-Construction and Site Access Phase includes the installation of vehicle tracking control (VTC), perimeter controls around stockpile locations, and stabilized staging areas (SSA). Perimeter control will consist of installing sediment control logs (SCL) or earthen berms (EB) as needed to intercept stormwater runoff from disturbed areas. If needed, stormwater runoff will be directed to sediment traps (ST) constructed prior flowing into the reservoir.

2. Construction Phase includes modifying the location of sediment control logs/berms as needed to accommodate stockpiles development, applying gravel and/or water to haul roads for dust control, surface roughening, seeding, and mulching.

3. Final Stabilization Phase includes temporary or permanent seeding, erosion control blankets, and removing all temporary BMPs when site has reached final stabilization.

NAD83 Colorado State Planes, North Zone, US Foot

REV	DATE	DESCRIPTION
A	11/04/22	ISSUED FOR REVIEW

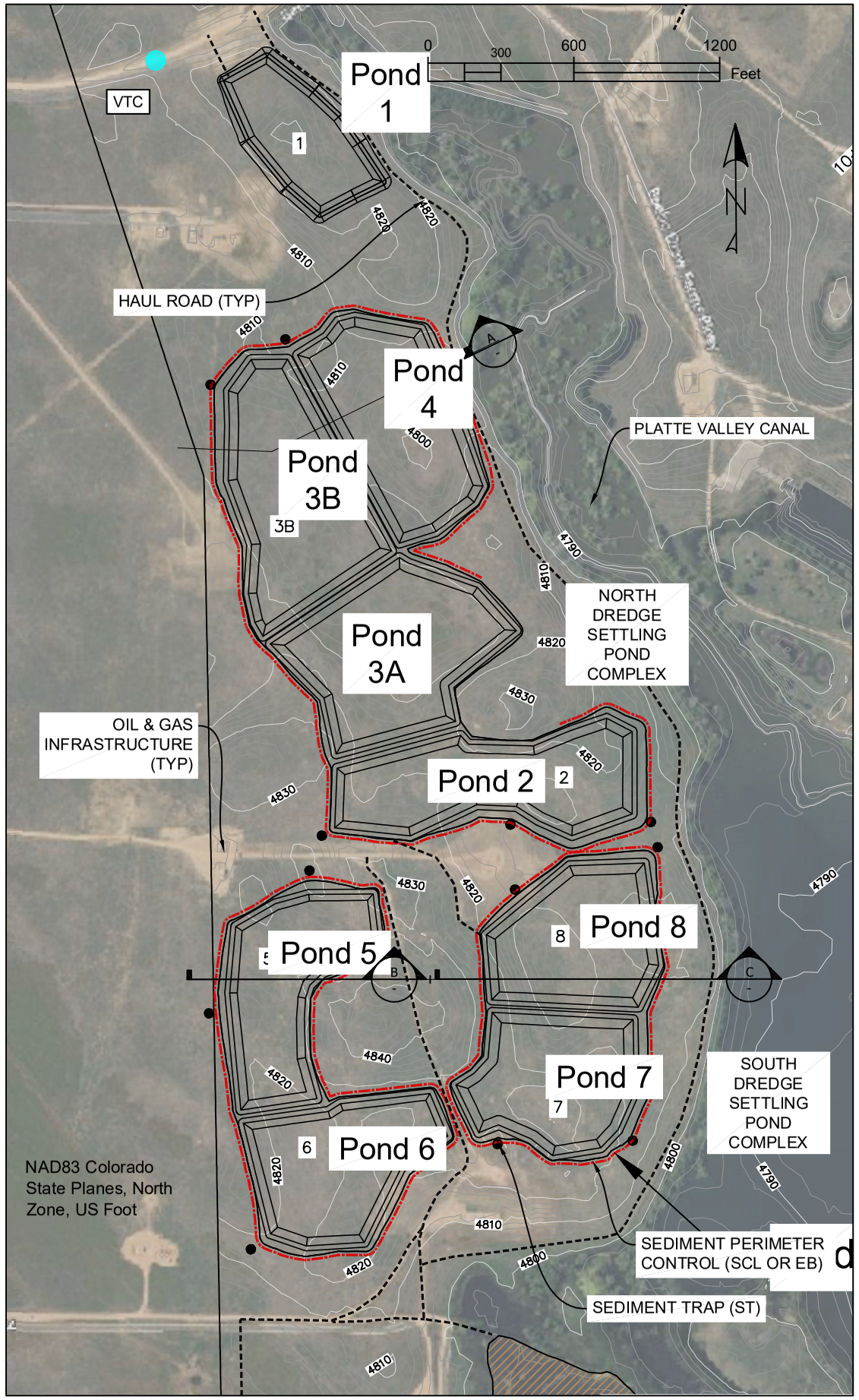
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

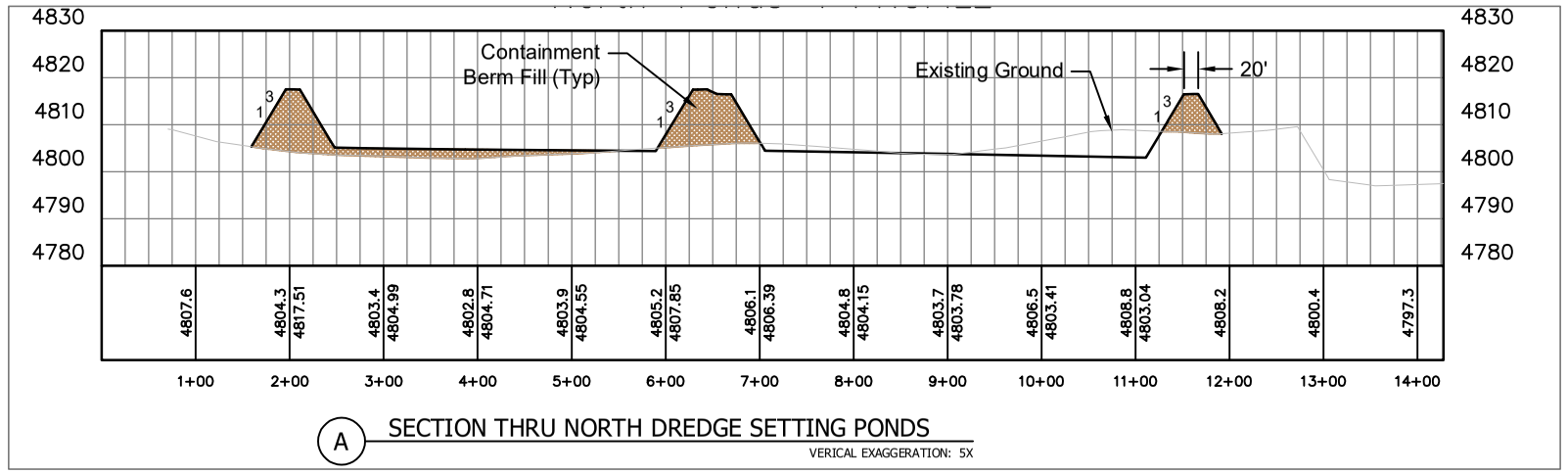
CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
OVERALL SITE PLAN

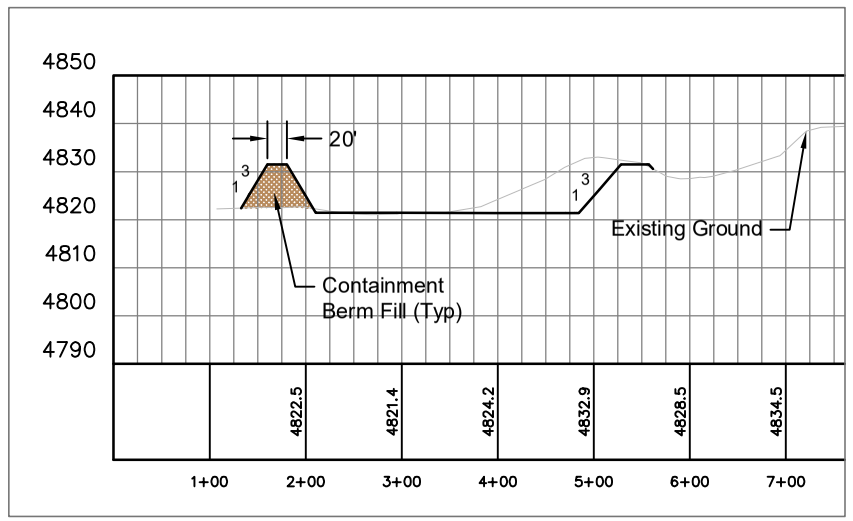
SHEET
02





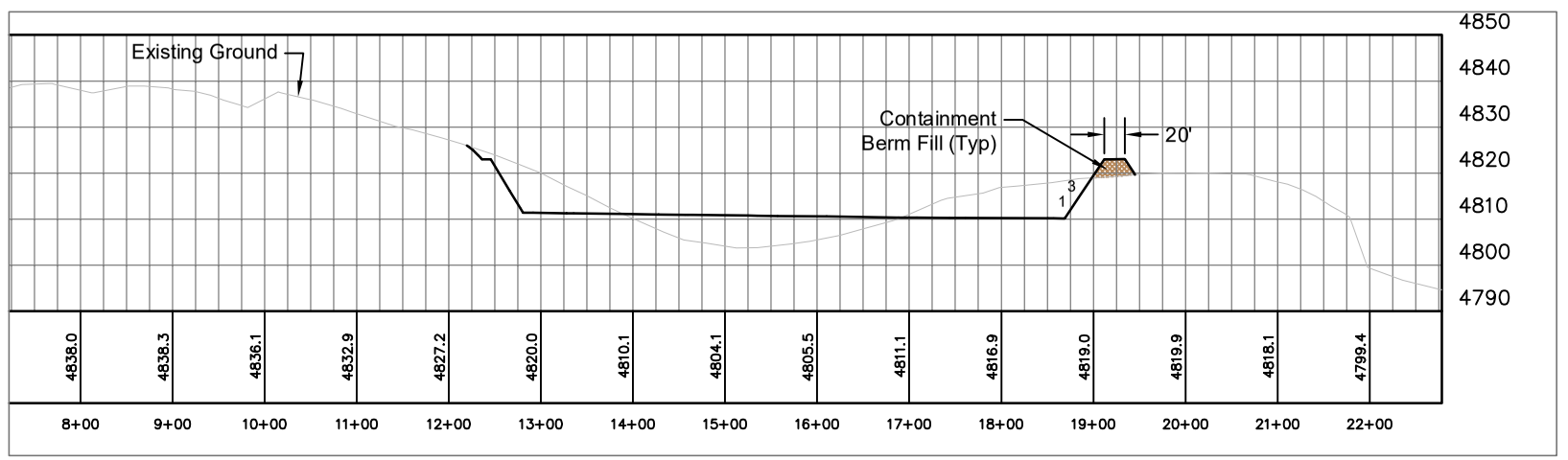
A SECTION THRU NORTH DREDGE SETTING PONDS

VERICAL EXAGGERATION: 5X



B SECTION THRU POND 5 DREDGE SETTLING POND

VERICAL EXAGGERATION: 5X



C SECTION THRU POND 8 DREDGE SETTLING POND

VERICAL EXAGGERATION: 5X

SPECIFICATIONS:

1. SUBGRADE PREPARATION: THE SUBGRADE BENEATH THE BERMS SHOULD BE FREE OF VEGETATION AND UNSUITABLE MATERIALS. SOFT, SATURATED, AND/OR LOOSE SOILS ENCOUNTERED DURING SUBGRADE PREPARATION SHALL BE REMOVED AND COMPETENT MATERIALS EXPOSED. PRIOR TO PLACEMENT OF FILL, THE EXPOSED SUBGRADE SHOULD BE THOROUGHLY SCARIFIED AND WELL-MIXED TO A DEPTH OF 6 INCHES, ADJUSTED TO A MOISTURE CONTENT WITHIN 3 PERCENT OF OPTIMUM, AND COMPACTED TO 95% OF THE STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY.

2. FILL OPERATIONS: MATERIALS WILL BE GENERATED FROM EXCAVATING WITHIN THE PROJECT AND CAN CONSIST OF A WIDE RANGE OF SOIL CLASSIFICATION. FROZEN MATERIAL, ICE, SNOW, COBBLES/RUBBLE LARGE ENOUGH TO INTERFERE WITH COMPACTION, DEBRIS AND OTHER DELETERIOUS MATERIAL SHOULD BE EXCLUDED FROM FILL MATERIALS. MATERIALS SHALL BE PLACED IN MAXIMUM ONE-FOOT COMPACTED LIFT THICKNESS AND TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AND TO WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT DETERMINED BY THE MODIFIED PROCTOR METHOD (ASTM D698).

3. DENSITY TESTING FREQUENCY REQUIREMENTS: DENSITY TESTING SHALL BE PERFORMED AT A MINIMUM FREQUENCY OF ONE PER 5000 CY OF BACKFILL PLACED. THE TESTS SHALL BE DISTRIBUTED THROUGH THE DIFFERENT LIFT LAYERS AND LATERALLY THROUGHOUT THE PROJECT. ADDITIONAL TESTING WILL BE REQUIRED AT THE ONSET OF FILL OPERATIONS TO DETERMINE METHODS AND PROCEDURES NEEDED TO OBTAIN THE PROPER MOISTURE AND COMPACTION. NUCLEAR DENSITY OR SAND CONE DENSITY ARE APPROVED METHODS FOR COMPLETING THE IN PLACE MOISTURE/DENSITY TESTING.

4. PROTECTION OF FILL MATERIALS: MATERIALS THAT HAVE BEEN COMPACTED AND MOISTURE CONDITIONS TO THE SPECIFICATIONS SHALL BE PROTECTED FROM FREEZING, EXCESS DRYING, INUNDATION, AND BECOMING SATURATED FROM PRECIPITATION EVENTS. FINISHED AREAS THAT HAVE BECOME DAMAGE OR COMPROMISED SHALL BE REMOVED AND REPLACED PER THE REQUIRED SPECIFICATIONS.

5. LABORATORY TESTING: FILL MATERIALS SHALL BE SUBJECTED TO LABORATORY INDEX TESTING (GRADATION, ATTERBERG LIMITS, MODIFIED PROCTOR AND NATURAL MOISTURE CONTENT) AT A MINIMUM RATE OF ONE SAMPLE PER 15,000 CY OF MATERIAL PLACED OR IF A CHANGE IN MATERIAL IS ENCOUNTERED.

REV	DATE	DESCRIPTION
A	11/04/22	ISSUED FOR REVIEW

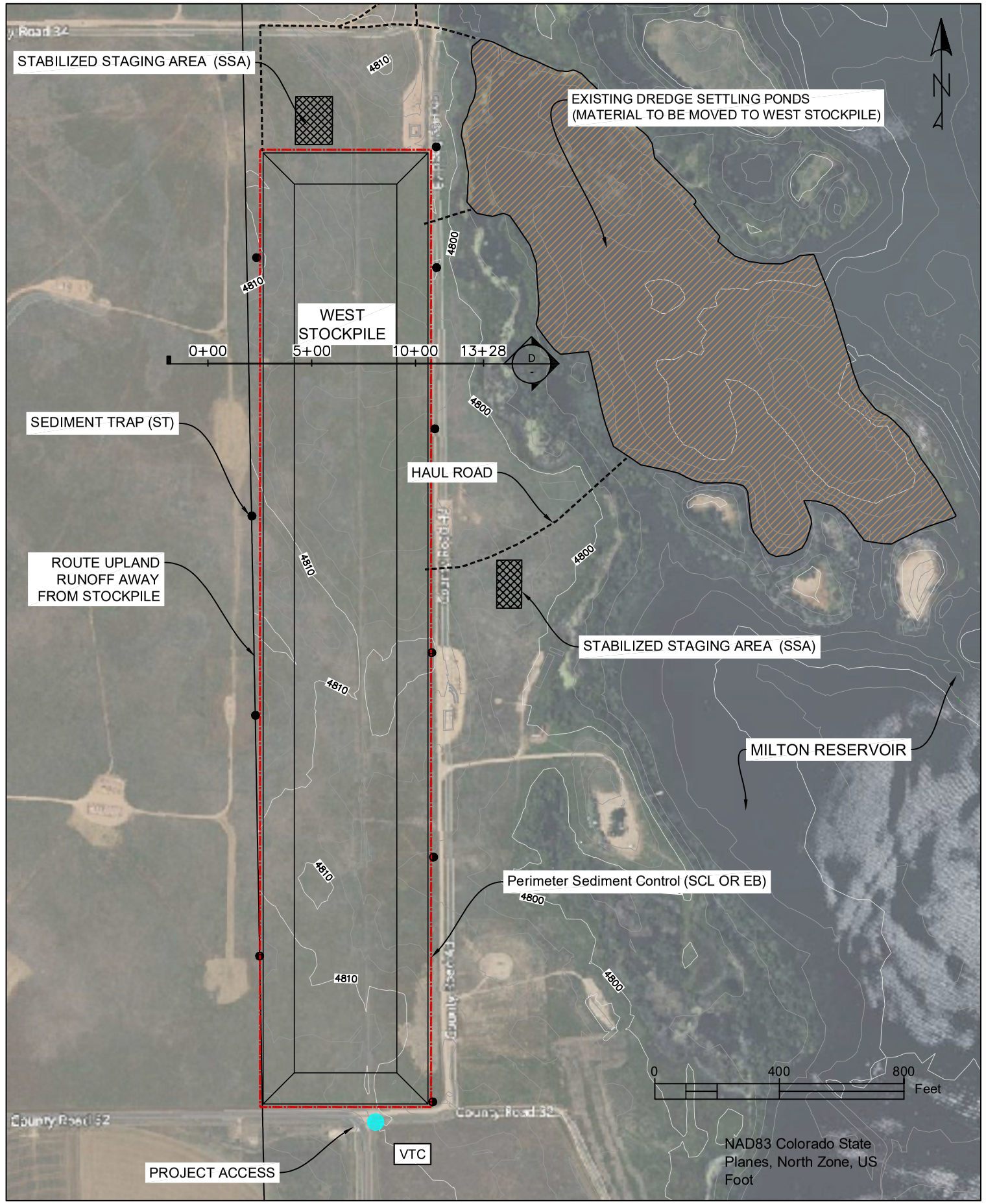
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

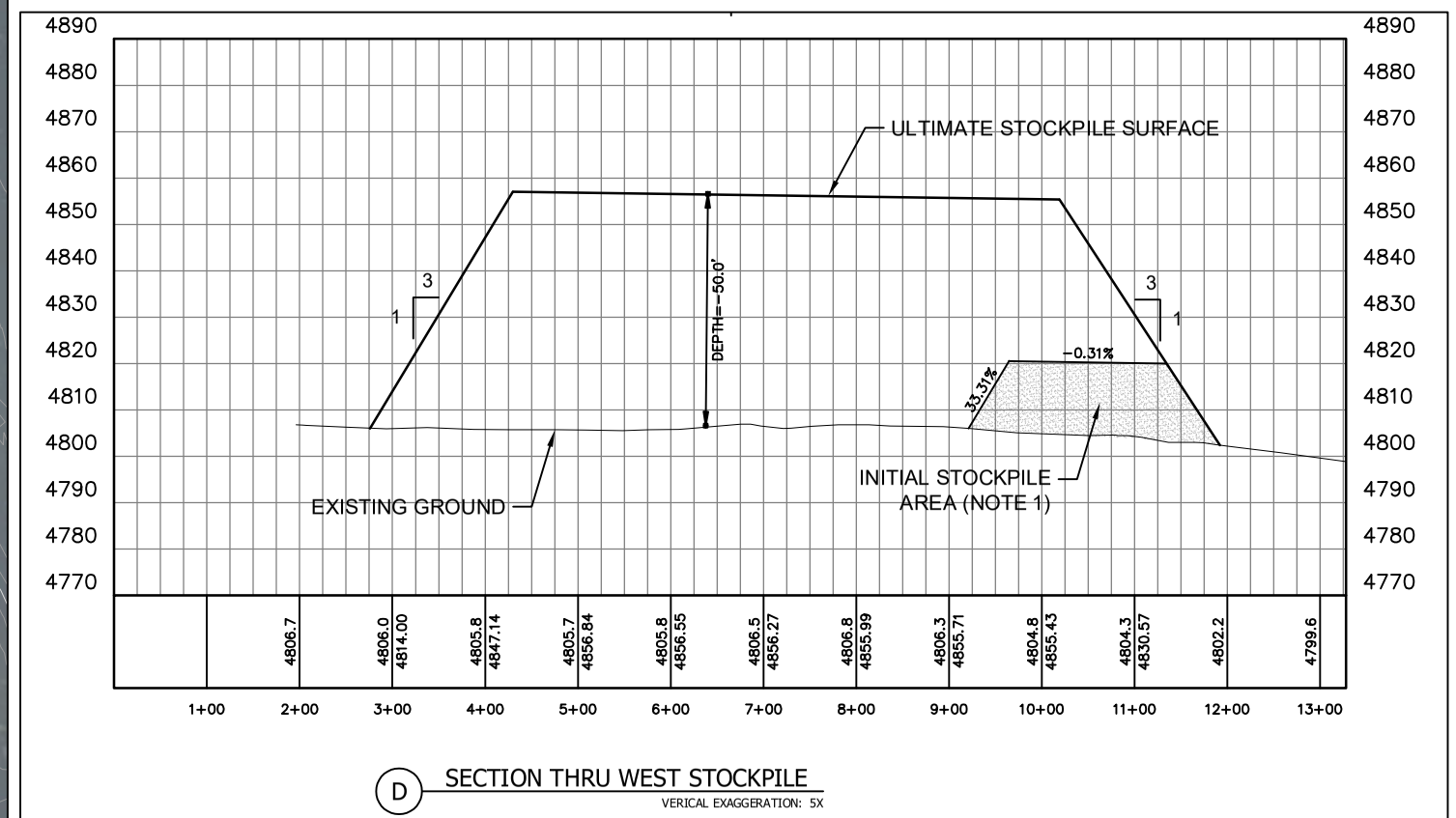
CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
PLAN 1

SHEET
03





D SECTION THRU WEST STOCKPILE
VERICAL EXAGGERATION: 5X

NOTES:
1. PHASED STOCKPILE DISTURBANCE AREA TO BE MINIMIZED BASED ON ESTIMATED YEARLY SEDIMENT REMOVAL VOLUME.

REV	DATE	DESCRIPTION
A	11/04/22	ISSUED FOR REVIEW

PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

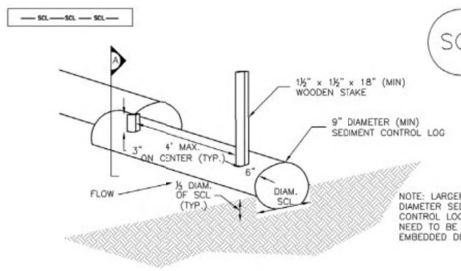
CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

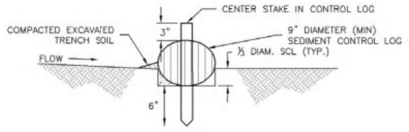
TITLE
PLAN 2

SHEET
04

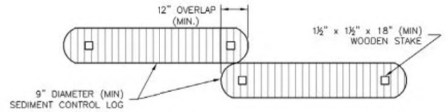
Sediment Control Log (SCL) SC-2



SEDIMENT CONTROL LOG



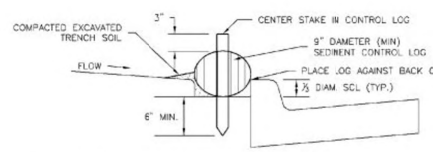
SECTION A



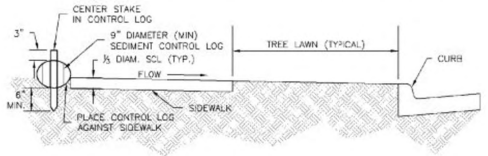
SEDIMENT CONTROL LOG JOINTS

SCL-1. SEDIMENT CONTROL LOG

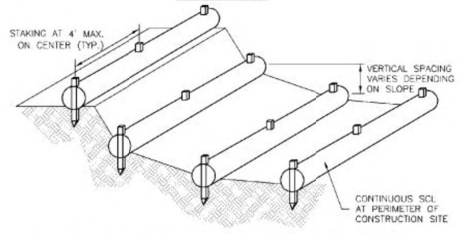
SC-2 Sediment Control Log (SCL)



SCL-2. SEDIMENT CONTROL LOG AT BACK OF CURB



SCL-3. SEDIMENT CONTROL LOG AT SIDEWALK WITH TREE LAWN



SCL-4. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

Sediment Control Log (SCL) SC-2

SEDIMENT CONTROL LOG INSTALLATION NOTES

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

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

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

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

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

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

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

SEDIMENT CONTROL LOG MAINTENANCE NOTES

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

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

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

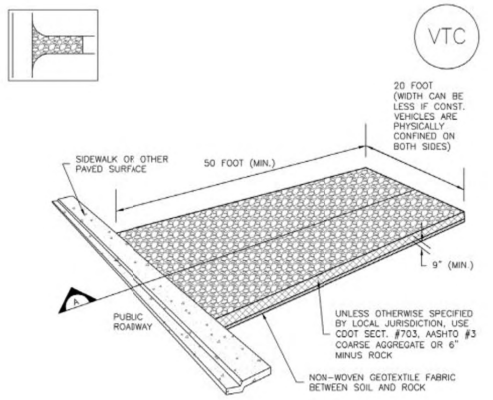
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

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

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

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

Vehicle Tracking Control (VTC) SM-4



SECTION A

VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

SM-4 Vehicle Tracking Control (VTC)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   -TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

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

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

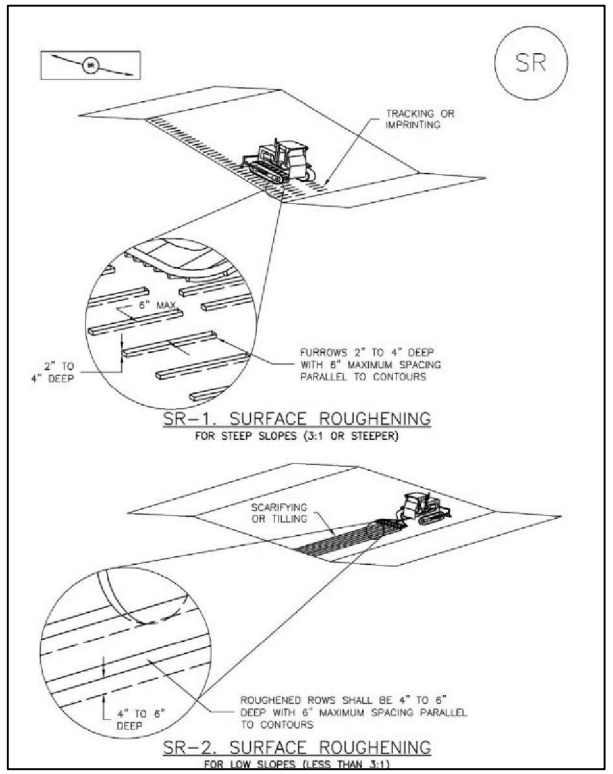
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT RACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

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

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)



SR-1. SURFACE ROUGHENING
FOR STEEP SLOPES (3:1 OR STEEPER)

SR-2. SURFACE ROUGHENING
FOR LOW SLOPES (LESS THAN 3:1)

SURFACE ROUGHENING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION(S) OF SURFACE ROUGHENING.

2. SURFACE ROUGHENING SHALL BE PROVIDED PROMPTLY AFTER COMPLETION OF FINISHED GRADING (FOR AREAS NOT RECEIVING TOPSOIL) OR PRIOR TO TOPSOIL PLACEMENT OR ANY FORECASTED RAIN EVENT.

3. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD WILL BE PLACED WITHOUT DELAY IN THE CONSTRUCTION SEQUENCE, SURFACE ROUGHENING IS NOT REQUIRED.

4. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.

5. A FARMING DISK SHALL NOT BE USED FOR SURFACE ROUGHENING.

SURFACE ROUGHENING MAINTENANCE NOTES

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

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

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACE UPON DISCOVERY OF THE FAILURE.

4. VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.

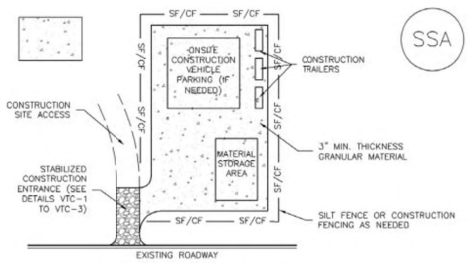
5. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.

6. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER RILL EROSION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

Stabilized Staging Area (SSA) SM-6



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF STAGING AREA(S).
   -CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

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

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

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

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

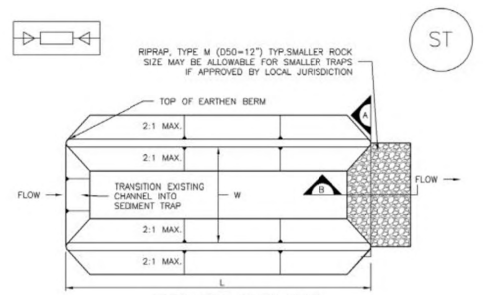
6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

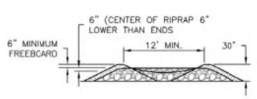
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

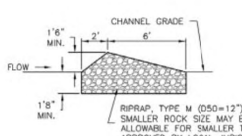
SC-8 Sediment Trap (ST)



SEDIMENT TRAP PLAN



SECTION A



SECTION B

ST-1. SEDIMENT TRAP

Sediment Trap (ST) SC-8

SEDIMENT TRAP INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.

2. ONLY USE FOR DRAINAGE AREAS LESS THAN 1 ACRE.

3. SEDIMENT TRAPS SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

4. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

5. SEDIMENT TRAP OUTLET TO BE CONSTRUCTED OF RIPRAP, TYPE M (D50=12") TYP.SMALLER ROCK SIZE MAY BE ALLOWABLE FOR SMALLER TRAPS IF APPROVED BY LOCAL JURISDICTION.

6. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE RIPRAP OUTLET STRUCTURE.

7. THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL BE A MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

SEDIMENT TRAP MAINTENANCE NOTES

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

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

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

4. REMOVE SEDIMENT ACCUMULATED IN TRAP AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN THE SEDIMENT DEPTH REACHES ½ THE HEIGHT OF THE RIPRAP OUTLET.

5. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT TRAPS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

REV	DATE	DESCRIPTION
A	11/04/22	ISSUED FOR REVIEW

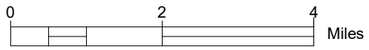
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
SEDIMENT & EROSION CONTROL DETAILS

SHEET
05



Sheet List Table	
Sheet Number	Sheet Title
01	COVER SHEET
02	GENERAL ARRANGEMENT
03	PLANVIEW WITH IMAGE
04	ULTIMATE FILLING PLAN AND TOPOGRAPHY
05	FILL GENERAL CROSS SECTIONS
06	EROSION & SEDIMENT CONTROL DETAILS

REV	DATE	DESCRIPTION
A	02/14/2023	ISSUED FOR REVIEW

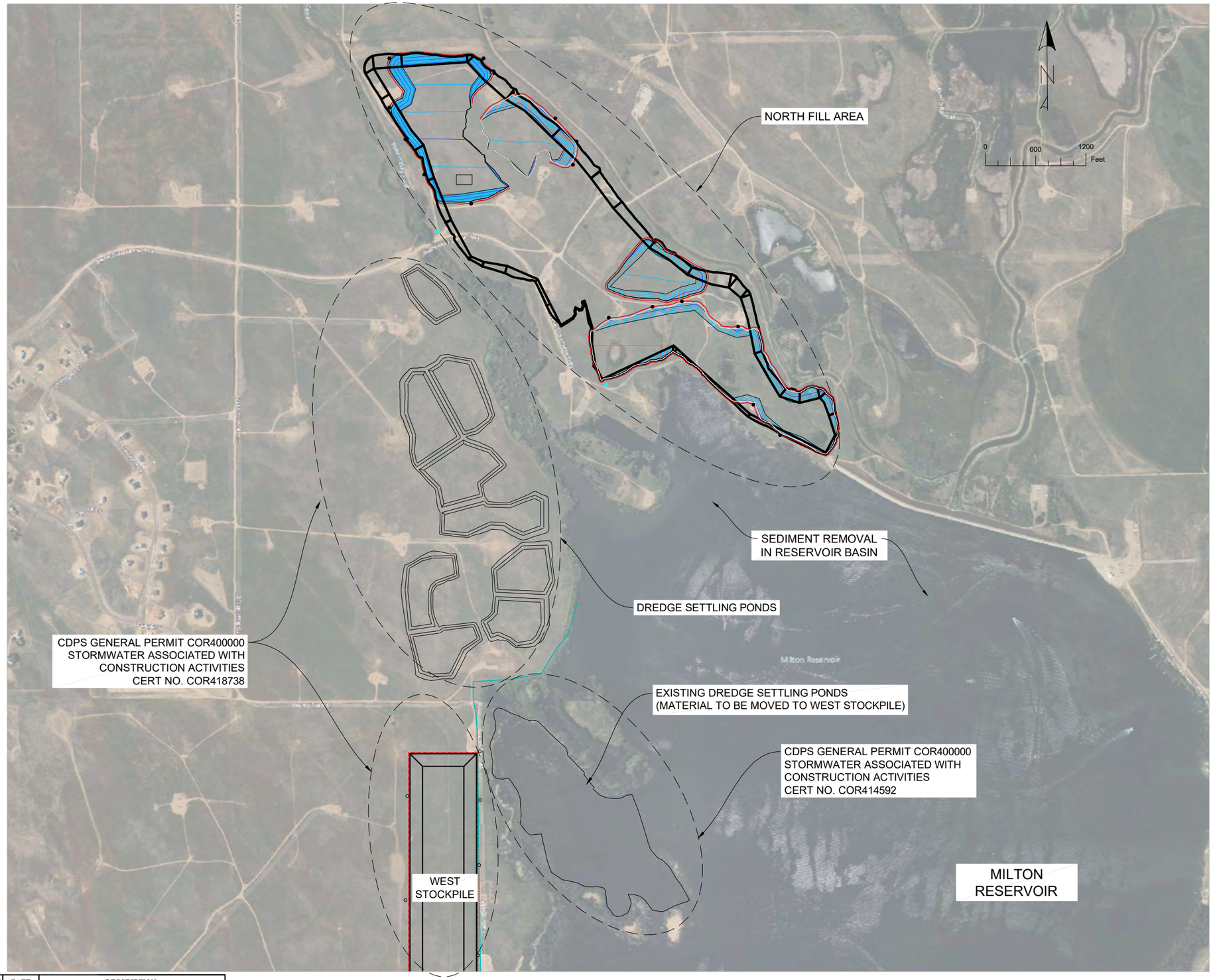
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
COVER SHEET

SHEET
01



REV	DATE	DESCRIPTION
A	02/14/2023	ISSUED FOR REVIEW

PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

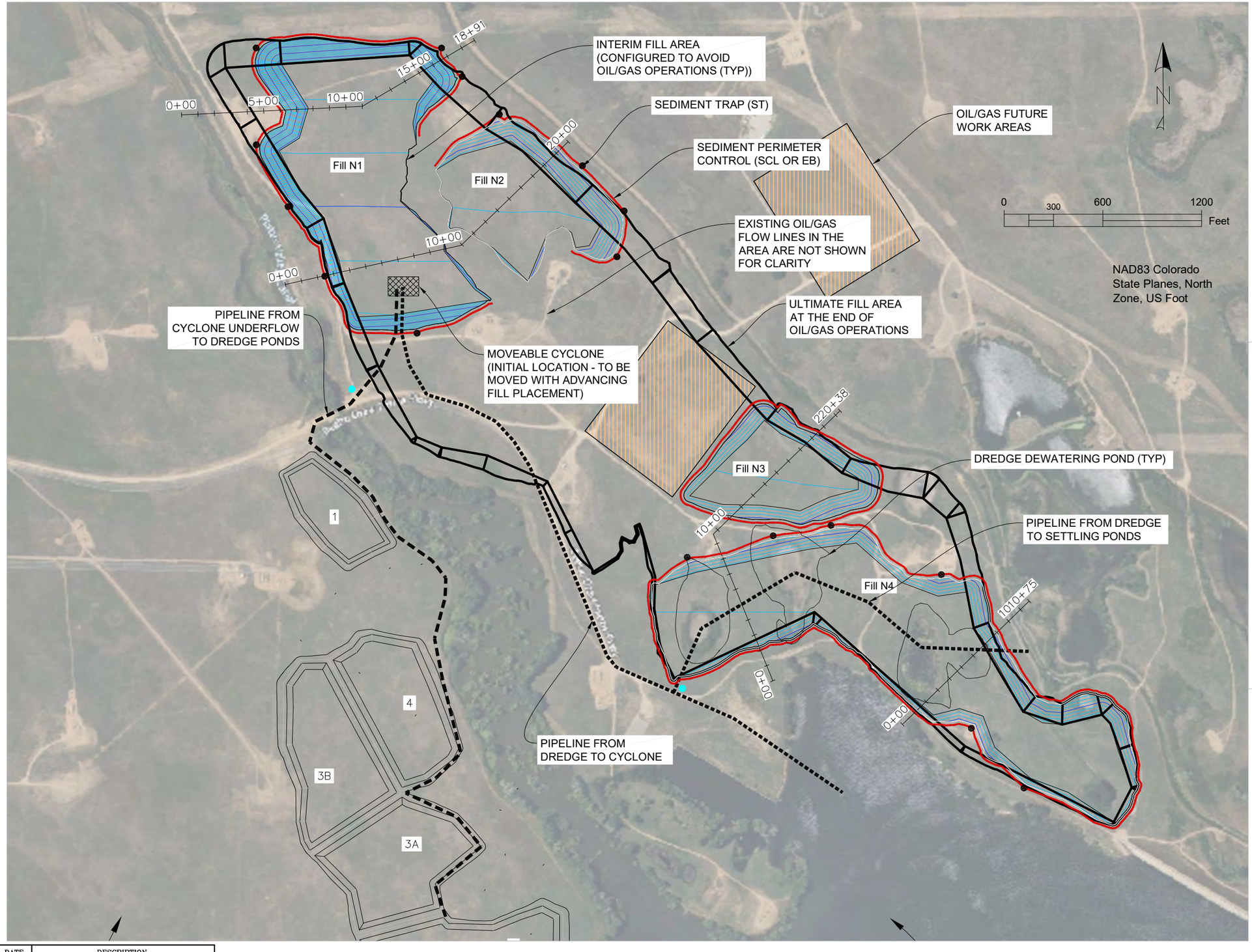
CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
GENERAL ARRANGEMENT

SHEET
02

C:\Users\Lisa\ERC Colorado Dropbox\ERC\01 projects\342 Milton\2203 Milton Dredge Project\02 ACAD\DWG_NW_FILL_EROS_SED\01 MILTON_NW_FILL_SED.dwg, 2/14/2023 2:23:13 PM, Microsoft Print to PDF



LEGEND

- SEDIMENT PERIMETER CONTROL (SCL OR EB)
- SEDIMENT COLLECTION AND CLEANOUT BASIN
- VEHICLE TRACKING CONTROL (VTC)
- STABILIZED STAGING AREA (SSA)

Phased BMP Implementation

1. Pre-Construction and Site Access Phase includes the installation of vehicle tracking control (VTC), perimeter controls around stockpile locations, and stabilized staging areas (SSA). Perimeter control will consist of installing sediment control logs (SCL) or earthen berms (EB) as needed to intercept stormwater runoff from disturbed areas. If needed, stormwater runoff will be directed to sediment traps (ST) constructed prior flowing into the reservoir.
2. Construction Phase includes modifying the location of sediment control logs/berms as needed to accommodate stockpiles development, applying gravel and/or water to haul roads for dust control, surface roughening, seeding, and mulching.
3. Final Stabilization Phase includes temporary or permanent seeding, erosion control blankets, and removing all temporary BMPs when site has reached final stabilization.

REV	DATE	DESCRIPTION
A	02/14/2023	ISSUED FOR REVIEW

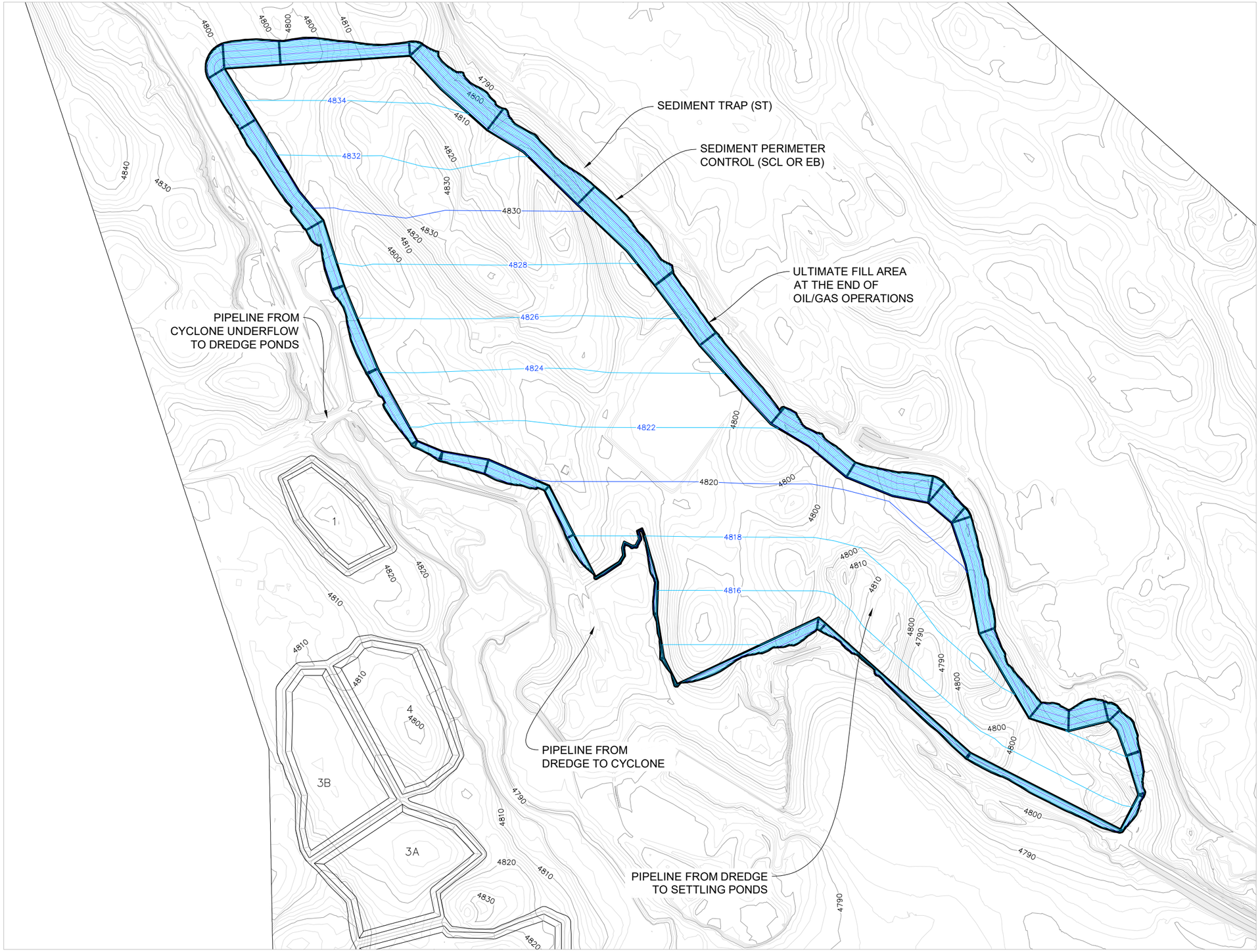
PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
PLANVIEW WITH IMAGE

SHEET
03



N

0 300 600 1200 Feet

NAD83 Colorado State Planes, North Zone, US Foot

REV	DATE	DESCRIPTION
A	11/04/22	ISSUED FOR REVIEW

PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

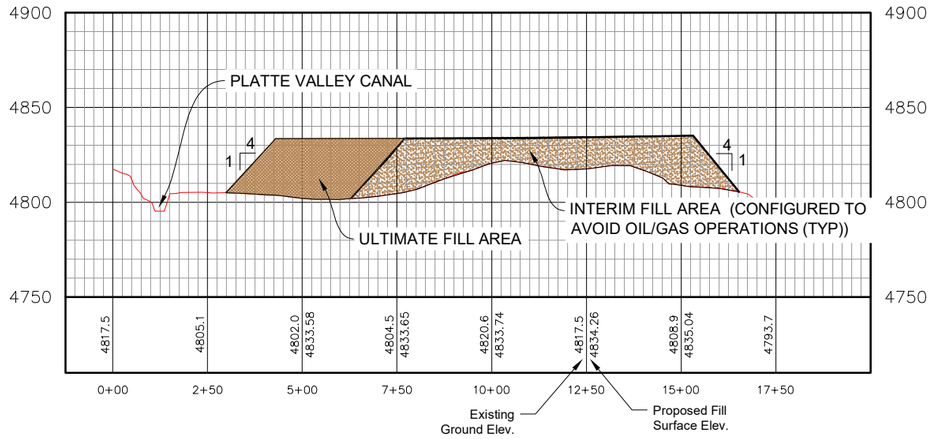
CLIENT: FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT: MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

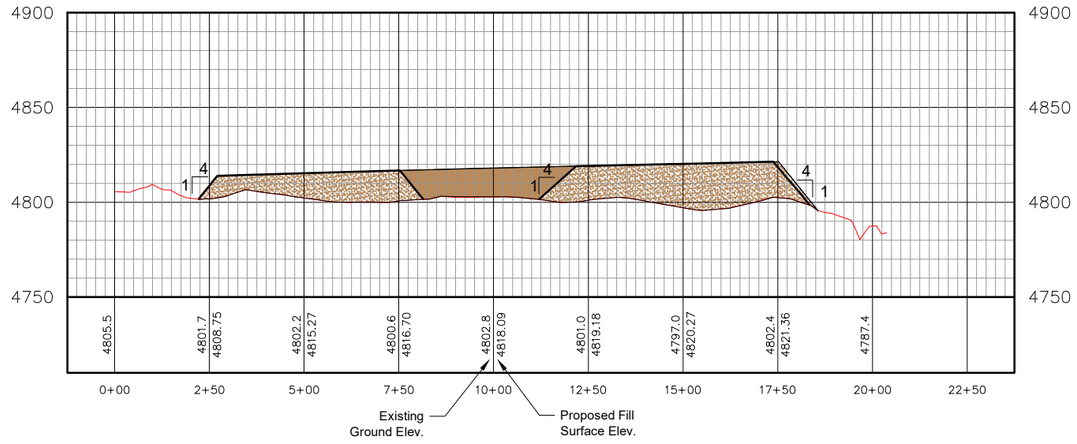
TITLE: ULTIMATE FILLING PLAN AND TOPOGRAPHY

SHEET: 04

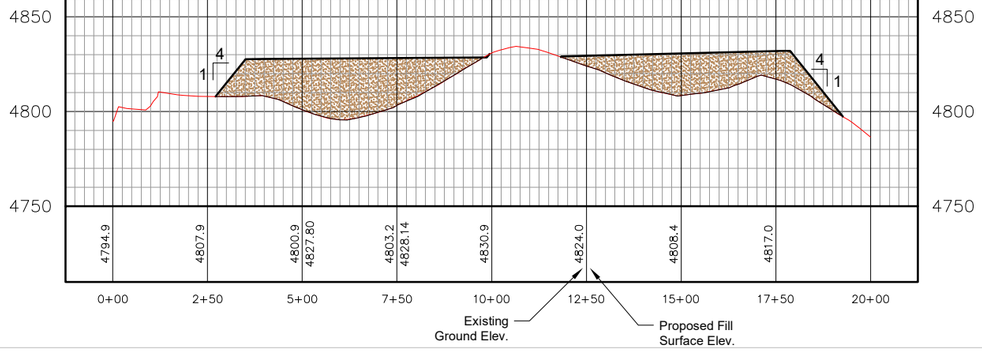
North–Fill–1 PROFILE



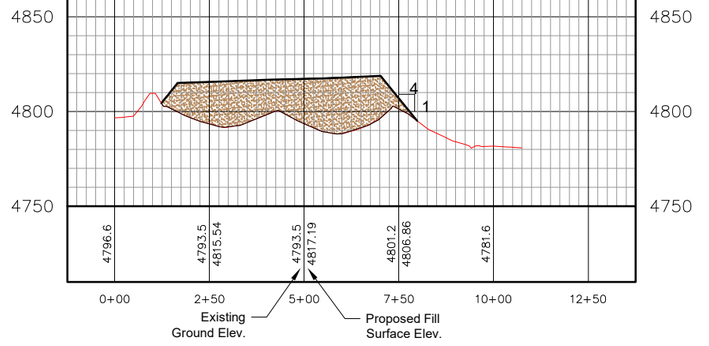
North–Fill–3 PROFILE



North–Fill–2 PROFILE



North–Fill–4 PROFILE



SPECIFICATIONS:

1. SUBGRADE PREPARATION: THE SUBGRADE BENEATH THE BERMS SHOULD BE FREE OF VEGETATION AND UNSUITABLE MATERIALS. SOFT, SATURATED, AND/OR LOOSE SOILS ENCOUNTERED DURING SUBGRADE PREPARATION SHALL BE REMOVED AND COMPETENT MATERIALS EXPOSED. PRIOR TO PLACEMENT OF FILL, THE EXPOSED SUBGRADE SHOULD BE THOROUGHLY SCARIFIED AND WELL-MIXED TO A DEPTH OF 6 INCHES, ADJUSTED TO A MOISTURE CONTENT WITHIN 3 PERCENT OF OPTIMUM, AND COMPACTED TO 95% OF THE STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY.

2. FILL OPERATIONS: MATERIALS WILL BE GENERATED FROM EXCAVATING WITHIN THE PROJECT AND CAN CONSIST OF A WIDE RANGE OF SOIL CLASSIFICATION. FROZEN MATERIAL, ICE, SNOW, COBBLES/RUBBLE LARGE ENOUGH TO INTERFERE WITH COMPACTION, DEBRIS AND OTHER DELETERIOUS MATERIAL SHOULD BE EXCLUDED FROM FILL MATERIALS. MATERIALS SHALL BE PLACED IN MAXIMUM ONE-FOOT COMPACTED LIFT THICKNESS AND TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AND TO WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT DETERMINED BY THE MODIFIED PROCTOR METHOD (ASTM D698).

3. DENSITY TESTING FREQUENCY REQUIREMENTS: DENSITY TESTING SHALL BE PERFORMED AT A MINIMUM FREQUENCY OF ONE PER 5000 CY OF BACKFILL PLACED. THE TESTS SHALL BE DISTRIBUTED THROUGH THE DIFFERENT LIFT LAYERS AND LATERALLY THROUGHOUT THE PROJECT. ADDITIONAL TESTING WILL BE REQUIRED AT THE ONSET OF FILL OPERATIONS TO DETERMINE METHODS AND PROCEDURES NEEDED TO OBTAIN THE PROPER MOISTURE AND COMPACTION. NUCLEAR DENSITY OR SAND CONE DENSITY ARE APPROVED METHODS FOR COMPLETING THE IN PLACE MOISTURE/DENSITY TESTING.

4. PROTECTION OF FILL MATERIALS: MATERIALS THAT HAVE BEEN COMPACTED AND MOISTURE CONDITIONS TO THE SPECIFICATIONS SHALL BE PROTECTED FROM FREEZING, EXCESS DRYING, INUNDATION, AND BECOMING SATURATED FROM PRECIPITATION EVENTS. FINISHED AREAS THAT HAVE BECOME DAMAGE OR COMPROMISED SHALL BE REMOVED AND REPLACED PER THE REQUIRED SPECIFICATIONS.

5. LABORATORY TESTING: FILL MATERIALS SHALL BE SUBJECTED TO LABORATORY INDEX TESTING (GRADATION, ATTERBERG LIMITS, MODIFIED PROCTOR AND NATURAL MOISTURE CONTENT) AT A MINIMUM RATE OF ONE SAMPLE PER 15,000 CY OF MATERIAL PLACED OR IF A CHANGE IN MATERIAL IS ENCOUNTERED.

REV	DATE	DESCRIPTION
A	02/14/2023	ISSUED FOR REVIEW

PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

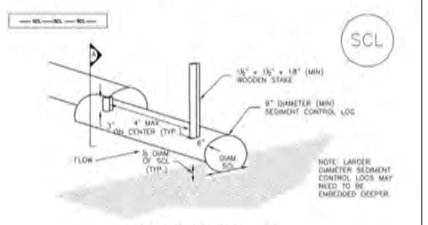
CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

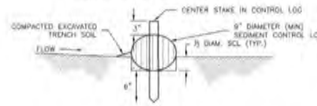
TITLE
FILL GENERAL CROSS SECTIONS

SHEET
05

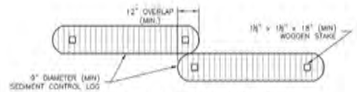
Sediment Control Log (SCL) SC-2



SEDIMENT CONTROL LOG



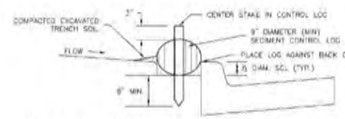
SECTION A



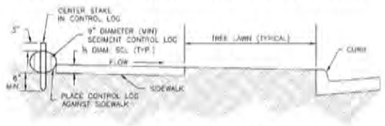
SEDIMENT CONTROL LOG JOINTS

SCL-1. SEDIMENT CONTROL LOG

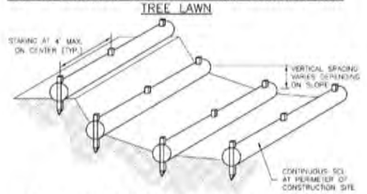
SC-2 Sediment Control Log (SCL)



SCL-2. SEDIMENT CONTROL LOG AT BACK OF CURB



SCL-3. SEDIMENT CONTROL LOG AT SIDEWALK WITH TREE LAWN



SCL-4. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

Sediment Control Log (SCL) SC-2

SEDIMENT CONTROL LOG INSTALLATION NOTES

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

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

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

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

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

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

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

SEDIMENT CONTROL LOG MAINTENANCE NOTES

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

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

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

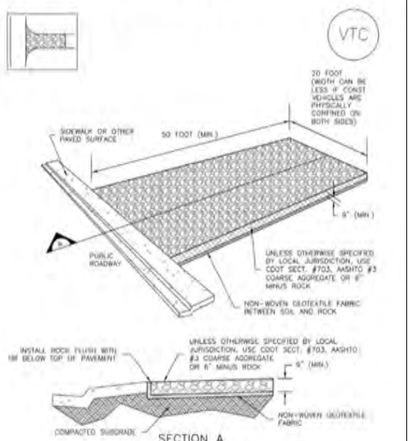
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

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

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

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

Vehicle Tracking Control (VTC) SM-4



SECTION A

VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

SM-4 Vehicle Tracking Control (VTC)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   -TYPE OF CONSTRUCTION ENTRANCE/EXIT(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF (X) SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

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

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

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

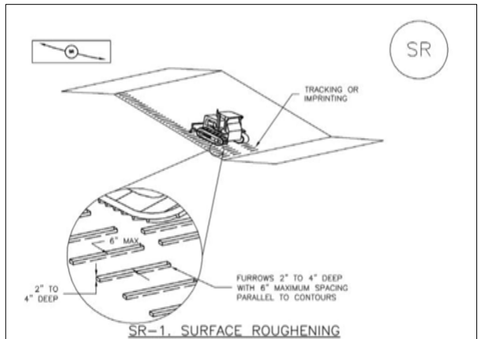
4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

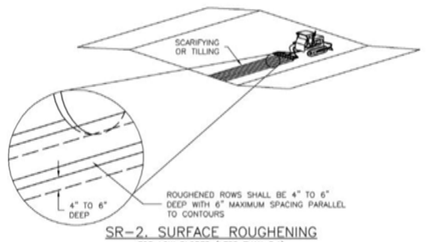
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO; NOT AVAILABLE IN AUTOCAD)

SR



SR-1. SURFACE ROUGHENING
FOR STEEP SLOPES (3:1 OR STEEPER)



SR-2. SURFACE ROUGHENING
FOR LOW SLOPES (LESS THAN 3:1)

SURFACE ROUGHENING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION(S) OF SURFACE ROUGHENING.

2. SURFACE ROUGHENING SHALL BE PROVIDED PROMPTLY AFTER COMPLETION OF FINISHED GRADING (FOR AREAS NOT RECEIVING TOPSOIL) OR PRIOR TO TOPSOIL PLACEMENT OR ANY FORECASTED RAIN EVENT.

3. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD WILL BE PLACED WITHOUT DELAY IN THE CONSTRUCTION SEQUENCE, SURFACE ROUGHENING IS NOT REQUIRED.

4. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.

5. A FARMING DISK SHALL NOT BE USED FOR SURFACE ROUGHENING.

SURFACE ROUGHENING MAINTENANCE NOTES

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

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

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACE UPON DISCOVERY OF THE FAILURE.

4. VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.

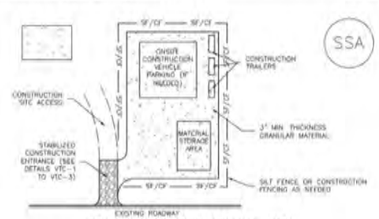
5. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.

6. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER RILL EROSION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

Stabilized Staging Area (SSA) SM-6



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF STAGING AREA(S).
   -CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF CDOT SECT #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

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

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

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

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

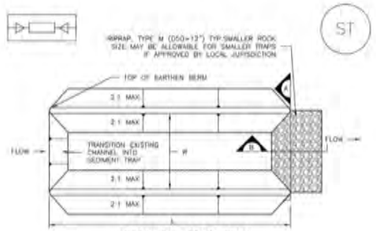
6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

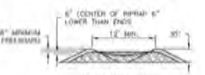
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

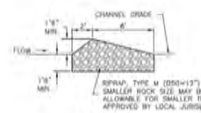
SC-8 Sediment Trap (ST)



SEDIMENT TRAP PLAN



SECTION A



SECTION B

ST-1. SEDIMENT TRAP

Sediment Trap (ST) SC-8

SEDIMENT TRAP INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.

2. ONLY USE FOR DRAINAGE AREAS LESS THAN 1 ACRE.

3. SEDIMENT TRAPS SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

4. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

5. SEDIMENT TRAP OUTLET TO BE CONSTRUCTED OF RIPRAP, TYPE M (D50=12") TYP.SMALLER ROCK SIZE MAY BE ALLOWABLE FOR SMALLER TRAPS IF APPROVED BY LOCAL JURISDICTION.

6. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE RIPRAP OUTLET STRUCTURE.

7. THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL BE A MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

SEDIMENT TRAP MAINTENANCE NOTES

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

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

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

4. REMOVE SEDIMENT ACCUMULATED IN TRAP AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN THE SEDIMENT DEPTH REACHES ½ THE HEIGHT OF THE RIPRAP OUTLET.

5. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT TRAPS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO; NOT AVAILABLE IN AUTOCAD)

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

REV	DATE	DESCRIPTION
A	02/14/2023	ISSUED FOR REVIEW

PREPARED BY
ECOLOGICAL RESOURCES CONSULTANTS, INC
225 UNION BLVD. SUITE 325
LAKEWOOD, CO 80228

CLIENT
FARMERS RESERVOIR AND IRRIGATION COMPANY

PROJECT
MILTON RESERVOIR SEDIMENT REMOVAL PROJECT

TITLE
EROSION & SEDIMENT CONTROL DETAILS

SHEET
06

Ecological Resource Consultants, Inc.
225 Union Blvd, Suite 325 ~ Lakewood, CO ~ 80228 ~ (303) 679-4820

MILTON RESERVOIR BASIN EXCAVATION and MATERIALS HANDLING PLAN
NORTH-NORTHWEST FILL AREAS
SUMMARY OF PROPOSED WORK ACTIVITIES

Milton reservoir is a plains reservoir fed by surface water diversions from the South Platte River through the Platte Valley and Beebe canals. It is owned and operated by Farmer's Reservoir and Irrigation Company (FRICO). Since its original construction in the early 1900s, the reservoir has accumulated a significant amount of sediment that are conveyed with inflows that enter the facility. It is estimated that the accumulated sediments have resulted in approximately 4,000 to 8,000 acre feet of lost reservoir capacity. A geotechnical investigation was completed in 2019 to evaluate accumulated sediments. From this evaluation, sediments were found to consist of primarily silty to lean clay sands with thicknesses ranging from 3 to 10 feet. FRICO started removing these sediments in November 2021 and will continue the removal process for several more years (+10 years). The removal process consists of using conventional earthmoving equipment such as scrapers and a dredge operation. Removal with conventional earthmoving equipment involved excavating materials directly from the reservoir and moving them to stockpiles located outside of the reservoir footprint. A dredge equipped with a cutter head and suction is currently and will continue to be used to remove solids as a slurry from the lake bottom which will be pumped to discharge basins located near the shoreline. Dredged materials are produced at a solids content of approximately 20% and require dewatering prior to hauling and placing the solids into a stockpile or fill areas. FRICO is currently dewatering the slurry using temporary holding/dewatering basins (dredge ponds). FRICO plans to expand the dewatering process using a cyclone operation where soil particles are removed from water through a vortex separation method. Once substantially dewatered, the materials will be moved to a stockpile or fill area. FRICO currently operates this project under two CDPS General Permits (COR400000) Certification Numbers: COR414592 (Date 2021-10-26) and COR418738 (11/10/2022).

Existing Permit COR414592: FRICO is currently dredging sediments from the reservoir and pumping the slurry to temporary holding bays for dewatering purposes. The current holding bays are located within an outer finger of the basin as shown on the drawing as "Dredged Settling Ponds". Once materials are sufficiently dewatered, they are moved to an area to the west denoted as the West Stockpile on the drawings. The stockpile is being developed as needed to contain the materials being removed during specific timeframes. The stockpiles have a maximum stack height of ~50 feet with outer slopes of 3H:1V. The stockpiles will be stabilized by establishing a vegetative cover. Interim sediment control BMPs are being implemented as needed to manage sediment and erosion during construction and until the site has been stabilized.

Existing Permit COR418738: Additionally, FRICO is currently building ponds adjacent to and northwest of the reservoir as shown on the drawings. The ponds are irregularly shaped with the intent of blending with the topography. The ponds were configured to avoid oil/gas pipelines and workings and to avoid excessive cut. The ponds will be constructed by a cut/fill operation where materials generated from cut will be used

for construction of the outer embankments. Embankments will be limited to approximately 10 feet high, have 3H:1V upstream slope and a 3H:1V downstream slopes with a 20-foot-wide crest, and be constructed of compacted fill materials placed in thin lifts. The ponds will be a maximum of approximately 10 feet deep, and, in some areas, the bottom of the pond will need to be filled to maintain the 10-foot depth.

EXPANDED PROJECT ACTIVITIES: FRICO plans to expand the project to include filling areas to the north-northwest side of the reservoir with dewatered sediments removed from the reservoir either by dredging or conventional earthmoving equipment. FRICO plans to use a cyclone to assist with the dewatering process. In general, the cyclone will be used to separate a significant portion of the solids from the dredged slurry mixture. The cyclone operation has an underflow discharge (drier, larger solids) and overflow (water mixed with some finer solids). The underflow will be routed to the fill areas either with a radial stacker or hauling equipment. Overflow will be directed via a large diameter pipeline to the dredge ponds where the remainder of the solids can be further dewatering via decanting and gravity operations. Once dewatered, the solids will be removed and placed into stockpiles or fill areas. The cyclone will be placed on a moveable platform such that it can be moved to accommodate the expanding fill area.

Interim fill placement areas (Fill N1, Fill N2, Fill N3, and Fill N4) have been developed based on working around, providing sufficient buffer for, and allowing access to the oil/gas well sites and associated pipelines as shown on the drawings. The interim configuration consists of four fill areas that can contain approximately 3 million cubic yards (CY).

The ultimate grading plan includes elevating the area on the lower end next to the lake approximately 15 ft above the high water level to an elevation of 4815 ft. This is five feet above the Milton dam crest elevation of 4810 ft and 12 ft above the emergency spillway elevation of 4803 ft. From the lower end moving northwest, the fill will be placed to form a finished surface having an overall slope of 0.5% to an elevation of 4835 ft on the northwest end. The outer fill slopes will be constructed at 4H:1V. Access to the fill area will be developed by excavating into the fill side slopes and creating a road surface with a gradient no greater than 4%. The ultimate configuration provides storage for approximately 5,000,000 cubic yards (CY) of fill material.

Another approach to dewatering will be to use the existing ponds at the south end of the fill area as shown on the drawing. To supplement the cyclone operation during the irrigation season when the Gilmore ditch is operating, FRICO will use these ponds for temporary holding and clarification of slurried dredged materials. Once water has clarified in the ponds, water would then decant over the crest of the ponds and outlet into the Evans #2 ditch and outflow into the Christina Pond. Here further clarification can occur prior to outfalling to the Gilmore ditch.

Sediment and erosion control would be completed in phases with implementation of pre-construction BMPs and work continuing through final stabilization. The plans would be dynamic and reviewed/adjusted periodically as the project develops over time. The Pre-Construction and Site Access Phase would include the installation of vehicle tracking control, perimeter controls around stockpile locations, and stabilized staging areas. Perimeter control will consist of installing sediment control logs or earthen berms as needed to intercept stormwater runoff from disturbed areas. If needed, stormwater

runoff will be directed to sediment traps (ST) that will be constructed to capture runoff at low points around the facilities. The Construction Phase would include modifying the location of sediment control logs/berms as needed to accommodate stockpiles development, applying gravel and/or water to haul roads for dust control, surface roughening, seeding, and mulching. The Final Stabilization Phase would include temporary or permanent seeding, erosion control blankets, and removing all temporary BMPs when site has reached final stabilization.