

Vehicle Tracking Control (VTC)

Description

A stabilized construction entrance (tracking pad) is a pad of gravel or cattle guard where construction traffic leave a site. The purpose of a stabilized entrance to a site is to minimize the amount of tracked mud and dust that leaves a site. As a vehicle drives over the gravel pad, mud and sediment are removed from the vehicle's wheels and offsite transport of soil is reduced. The gravel pad also reduces erosion and rutting in the soil beneath the stabilized structure. The filter fabric separates the gravel from the soil below, preventing the gravel from being ground into the soil. The fabric also reduces the amount of rutting caused by vehicle tires by spreading the vehicle's weight over a larger soil area than just the width of the tire.

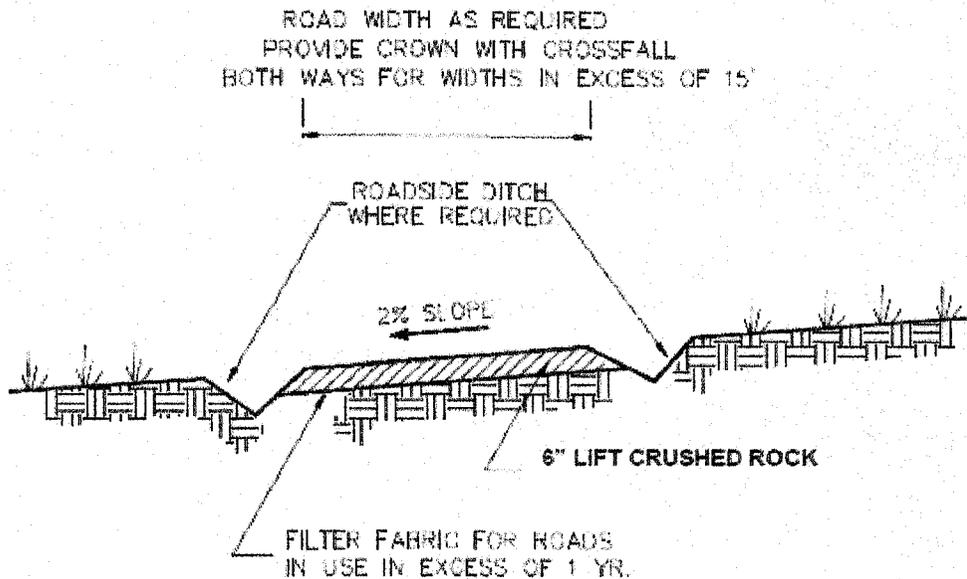
Applicability

Typically, stabilizing a construction entrances are installed at locations where construction traffic leaves or enters an existing paved road. However, the applicability of site entrance stabilization should be extended to any roadway or entrance where vehicles will access or leave the site.

Limitations

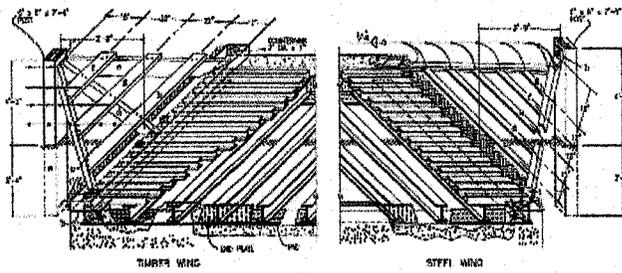
- Although stabilizing a construction entrance is a good way to help reduce the amount of sediment leaving a site, some soil may still be deposited from vehicle tires onto paved surfaces. To further reduce the chance of these sediments polluting storm water runoff, sweeping of the paved area adjacent to the stabilized site entrance is recommended.
- Site traps or other secondary sediment controls are needed to capture that sediment that accumulates at the pad and may run off during storm events.

Design Criteria

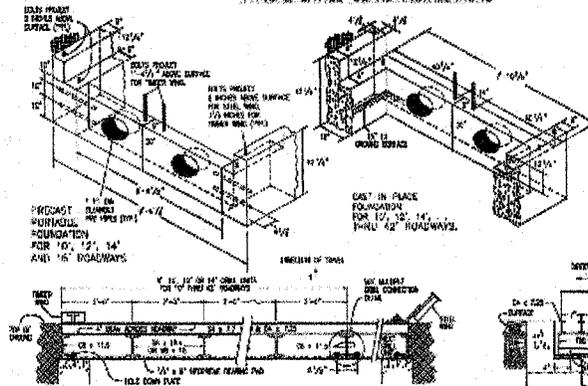


See figure SCE-1 for installation details.

- If the pad is constructed on a crowned road, a road side ditch with check dams or sediment traps be located on both sides of the road to collect runoff from the pad. If the road slopes to only one side of the road then only one roadside ditch with sediment controls will be needed.
- Place a matrix of 2 to 4 inch washed stone, reclaimed or recycled concrete equivalent to a minimum of 12 feet wide and 20 feet in length.
- All surface water flowing or diverted toward construction entrance shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.



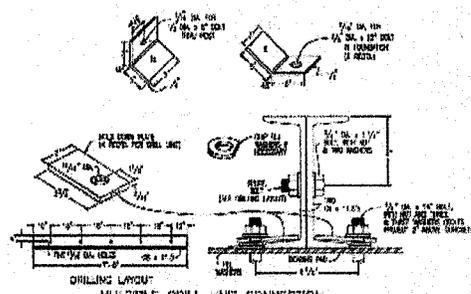
TYPICAL CATTLE GUARD INSTALLATIONS



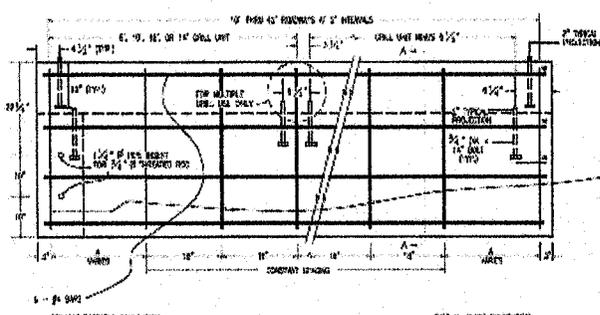
WELDED GRILL CROSS SECTIONS

GENERAL NOTES

1. CONCRETE SHALL BE CLASS B. FOUNDATION MAY BE CAST-IN-PLACE OR PRECAST.
2. REINFORCING BARS SHALL BE DEFORMED TYPE No. 4.
3. ALL STEEL SHALL BE PLATED IN ACCORDANCE WITH ASSOCIATED AISC AND AWWA DATA.
4. WELD JOINTS MAY BE MADE FROM B OR BEHIND MAIN THICKNESS.
5. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND FINISHED WITH ALLOWABLE PAINT IN ACCORDANCE WITH SPECIFICATIONS FOR ALL STRUCTURES SHALL BE SUBMITTED IN ACCORDANCE WITH ASSOCIATED AISC AND AWWA DATA.
6. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH ASSOCIATED AISC AND AWWA DATA.
7. WELDING SHALL CONFORM TO THE LATEST EDITION OF THE AISC SPECIFICATION FOR STRUCTURAL STEEL AND AWWA STANDARD SPECIFICATIONS FOR WELDING OF STRUCTURAL STEEL. WELDING SHALL BE DONE IN ACCORDANCE WITH ASSOCIATED AISC AND AWWA DATA.
8. WELD JOINTS SHALL BE TO BE INSTALLED IN ACCORDANCE WITH ASSOCIATED AISC AND AWWA DATA.
9. TYPE OF WELD JOINTS SHALL BE TO BE INSTALLED IN ACCORDANCE WITH ASSOCIATED AISC AND AWWA DATA.
10. STRUCTURAL FOUNDATION AND STRUCTURAL STEEL SHALL NOT BE SPACED AND PAINT FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE CATTLE GUARD.



MULTIPLE GRILL UNIT CONNECTION



ELEVATION OF FOUNDATION

FOUNDATION QUANTITIES

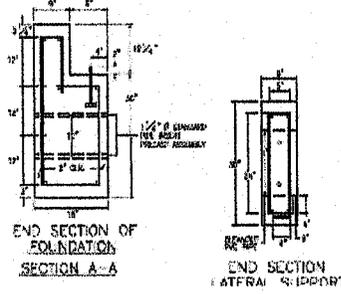
FOUNDA- TION NO.	CONCRETE VOL. (CU YD)	PRECAST		CAST-IN-PLACE		TOTAL FOUNDA- TION VOL. (CU YD)
		CONCRETE VOL. (CU YD)	REINFORCING BAR (LBS)	CONCRETE VOL. (CU YD)	REINFORCING BAR (LBS)	
10	10	10	10	10	10	20
11	11	11	11	11	11	22
12	12	12	12	12	12	24
13	13	13	13	13	13	26
14	14	14	14	14	14	28
15	15	15	15	15	15	30
16	16	16	16	16	16	32
17	17	17	17	17	17	34
18	18	18	18	18	18	36
19	19	19	19	19	19	38
20	20	20	20	20	20	40
21	21	21	21	21	21	42
22	22	22	22	22	22	44
23	23	23	23	23	23	46
24	24	24	24	24	24	48
25	25	25	25	25	25	50
26	26	26	26	26	26	52
27	27	27	27	27	27	54
28	28	28	28	28	28	56
29	29	29	29	29	29	58
30	30	30	30	30	30	60
31	31	31	31	31	31	62
32	32	32	32	32	32	64
33	33	33	33	33	33	66
34	34	34	34	34	34	68
35	35	35	35	35	35	70
36	36	36	36	36	36	72
37	37	37	37	37	37	74
38	38	38	38	38	38	76
39	39	39	39	39	39	78
40	40	40	40	40	40	80
41	41	41	41	41	41	82
42	42	42	42	42	42	84

WELDED GRILL UNITS

SIZE (FEET)	WEIGHT (LBS)
6'	1500
8'	2200
10'	3200
12'	4500

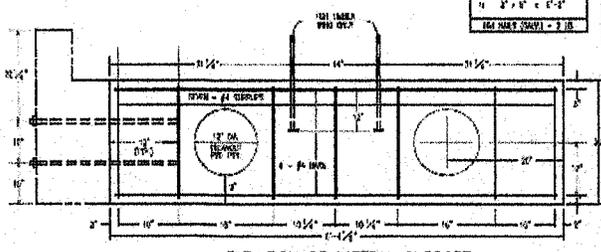
WING QUANTITIES

WING TYPE	WING SIZE	WEIGHT (LBS)
1	6' x 8' x 7'-4"	1500
2	8' x 8' x 7'-4"	2200
3	10' x 8' x 7'-4"	3200
4	12' x 8' x 7'-4"	4500
5	14' x 8' x 7'-4"	6000
6	16' x 8' x 7'-4"	7800
7	18' x 8' x 7'-4"	9800
8	20' x 8' x 7'-4"	12000
9	22' x 8' x 7'-4"	14500
10	24' x 8' x 7'-4"	17000
11	26' x 8' x 7'-4"	19500
12	28' x 8' x 7'-4"	22000
13	30' x 8' x 7'-4"	24500
14	32' x 8' x 7'-4"	27000
15	34' x 8' x 7'-4"	29500
16	36' x 8' x 7'-4"	32000
17	38' x 8' x 7'-4"	34500
18	40' x 8' x 7'-4"	37000
19	42' x 8' x 7'-4"	39500
20	44' x 8' x 7'-4"	42000
21	46' x 8' x 7'-4"	44500
22	48' x 8' x 7'-4"	47000
23	50' x 8' x 7'-4"	49500
24	52' x 8' x 7'-4"	52000
25	54' x 8' x 7'-4"	54500
26	56' x 8' x 7'-4"	57000
27	58' x 8' x 7'-4"	59500
28	60' x 8' x 7'-4"	62000
29	62' x 8' x 7'-4"	64500
30	64' x 8' x 7'-4"	67000
31	66' x 8' x 7'-4"	69500
32	68' x 8' x 7'-4"	72000
33	70' x 8' x 7'-4"	74500
34	72' x 8' x 7'-4"	77000
35	74' x 8' x 7'-4"	79500
36	76' x 8' x 7'-4"	82000
37	78' x 8' x 7'-4"	84500
38	80' x 8' x 7'-4"	87000
39	82' x 8' x 7'-4"	89500
40	84' x 8' x 7'-4"	92000
41	86' x 8' x 7'-4"	94500
42	88' x 8' x 7'-4"	97000
43	90' x 8' x 7'-4"	99500
44	92' x 8' x 7'-4"	102000
45	94' x 8' x 7'-4"	104500
46	96' x 8' x 7'-4"	107000
47	98' x 8' x 7'-4"	109500
48	100' x 8' x 7'-4"	112000
49	102' x 8' x 7'-4"	114500
50	104' x 8' x 7'-4"	117000
51	106' x 8' x 7'-4"	119500
52	108' x 8' x 7'-4"	122000
53	110' x 8' x 7'-4"	124500
54	112' x 8' x 7'-4"	127000
55	114' x 8' x 7'-4"	129500
56	116' x 8' x 7'-4"	132000
57	118' x 8' x 7'-4"	134500
58	120' x 8' x 7'-4"	137000
59	122' x 8' x 7'-4"	139500
60	124' x 8' x 7'-4"	142000
61	126' x 8' x 7'-4"	144500
62	128' x 8' x 7'-4"	147000
63	130' x 8' x 7'-4"	149500
64	132' x 8' x 7'-4"	152000
65	134' x 8' x 7'-4"	154500
66	136' x 8' x 7'-4"	157000
67	138' x 8' x 7'-4"	159500
68	140' x 8' x 7'-4"	162000
69	142' x 8' x 7'-4"	164500
70	144' x 8' x 7'-4"	167000
71	146' x 8' x 7'-4"	169500
72	148' x 8' x 7'-4"	172000
73	150' x 8' x 7'-4"	174500
74	152' x 8' x 7'-4"	177000
75	154' x 8' x 7'-4"	179500
76	156' x 8' x 7'-4"	182000
77	158' x 8' x 7'-4"	184500
78	160' x 8' x 7'-4"	187000
79	162' x 8' x 7'-4"	189500
80	164' x 8' x 7'-4"	192000
81	166' x 8' x 7'-4"	194500
82	168' x 8' x 7'-4"	197000
83	170' x 8' x 7'-4"	199500
84	172' x 8' x 7'-4"	202000
85	174' x 8' x 7'-4"	204500
86	176' x 8' x 7'-4"	207000
87	178' x 8' x 7'-4"	209500
88	180' x 8' x 7'-4"	212000
89	182' x 8' x 7'-4"	214500
90	184' x 8' x 7'-4"	217000
91	186' x 8' x 7'-4"	219500
92	188' x 8' x 7'-4"	222000
93	190' x 8' x 7'-4"	224500
94	192' x 8' x 7'-4"	227000
95	194' x 8' x 7'-4"	229500
96	196' x 8' x 7'-4"	232000
97	198' x 8' x 7'-4"	234500
98	200' x 8' x 7'-4"	237000
99	202' x 8' x 7'-4"	239500
100	204' x 8' x 7'-4"	242000



END SECTION OF FOUNDATION SECTION A-A

END SECTION OF LATERAL SUPPORT



ELEVATION OF LATERAL SUPPORT

Maintenance Considerations

The frequency of inspections should be in accordance with the Storm Water Management Plan (SWMP). Stabilization of site entrances should be maintained until the remainder of the construction site has been fully stabilized. Stone and gravel might need to be periodically added to each stabilized construction site entrance to keep the entrance effective. Soil that is tracked offsite should be swept up immediately for proper disposal.

References

Colorado Department of Transportation (CDOT), *Erosion Control and Stormwater Quality Guide*. 2002. <http://www.dot.state.co.us/environmental/envWaterQual/wqms4.asp>

Environmental Protection Agency (EPA), *National Pollutant Discharge Elimination System (NPDES). Construction Site Storm Water Runoff Control*. Washington, D.C., February 2003.

http://cfpud.epa.gov/npdes/stormwater/menufbmps/con_site.cfm

Horizon Environmental Services, Inc, *Guidance Document Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites*. April 2004.

Wattles (W)

Description

A wattle, (consist of straw, rock, flax, or other similar materials bound into a tight tubular roll. When wattles are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. By interrupting the length of a slope, fiber rolls can also reduce erosion.

Applicability

Wattles may be suitable:

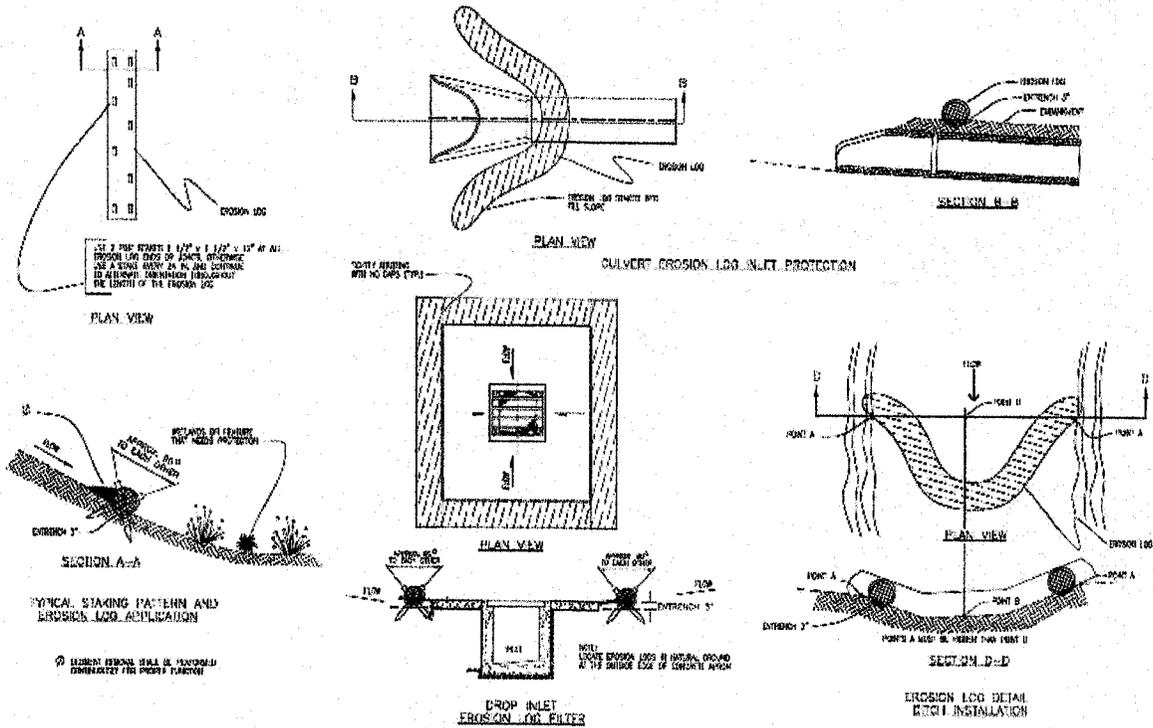
- Along the top, face, and at the grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- At the end of a downward slope where it transitions to a steeper slope.
- Along the perimeter of a project.
- At the overflow location of sediment traps.
- As check dams in unlined ditches.
- Around temporary stockpiles.

Limitations

- Wattles are not effective unless trenched.
- Wattles at the toe of the slope greater than 5:1 (H: V) should be a minimum of 20 inch diameter or installations achieving the same protection (i.e., stacked smaller diameter wattles, etc.).
- Difficult to move once saturated.
- If not properly staked and trenched in, wattles could be transported in high flows.
- Wattles have a very limited sediment capture zone.
- Wattles should not be used on sloped subject to creep, slumping, or landslide.

- Wattles should not be used where periodic road or surface maintenance activities are expected.

Design Criteria



Construction Specifications

Wattles should be either prefabricated rolls or rolled tubes of erosion control blankets. If using erosion control blankets, roll the length of erosion control blanket, roll the length of the blanket into a tube of minimum 8" diameter and bind roll at each end and every 4 feet along length of roll with jute type twine.

See figure W-1 for wattles used to control erosion along slopes.

1. Locate wattles on level contours spaced as follows:
 - a. Slope inclination of 4:1 or flatter: Fiber rolls should be placed at a maximum interval of 20 feet.
 - b. Slope inclination between 4:1 and 2:1: Fiber rolls should be placed at a maximum of 15 feet.

- c. Slope inclination 2:1 or greater: Fiber rolls should be placed at a maximum interval of 10 feet.
2. Turn the ends of the wattles up slope to prevent runoff from going around the roll.
3. Stake wattles into a 2 to 4 inch deep trench with a width equal to the diameter of the wattle. Drive stakes at the end of each wattle and spaced 4 feet maximum on center.
4. If more than one wattle is placed in a row, the rolls should be overlapped, not abutted.

Maintenance Considerations

The frequency of inspections should be in accordance with the Storm Water Management Plan (SWMP). Repair or replace split, torn, unraveling, or slumping rolls. If the wattle is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates must be periodically removed in order to maintain wattle effectiveness. Sediment should be removed when sediment accumulation reaches half the distance between the top of the wattle and the adjacent ground surface.

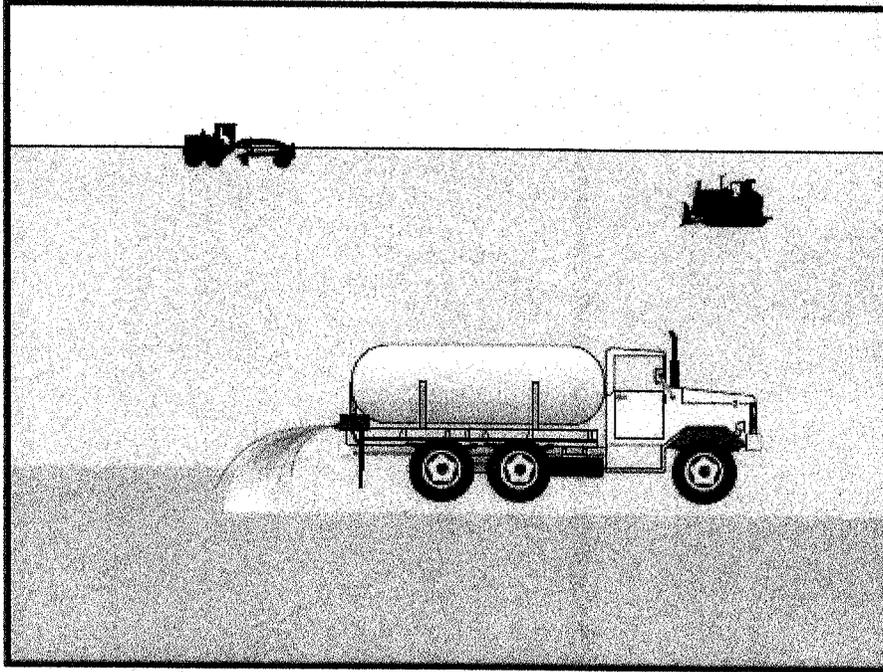
Removal

Wattles are typically left in place. If wattles are removed, collect and disposed of sediment accumulation, and fill and compact holes, trenches, depressions, or any other ground disturbance to blend with adjacent ground.

References

California Stormwater Quality Association, *Stormwater Best Management Practices (BMP) handbook-Construction*. January, 2003. <<http://www.cabmphandbooks.com/Construction.asp>>

Wind Erosion Control (WEC)



Description and Purpose

Wind erosion or dust control consists of applying water or other dust palliatives as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

Suitable Applications

Wind erosion controls BMPs are suitable during the following construction activities:

- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Sediment tracking onto paved roads
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil

- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period and should be applied daily (or more often) to be effective.
- Over watering may cause erosion.
- Oil or oil-treated sub grade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Effectiveness depends on soil, temperature, humidity, and wind velocity.
- Chemically treated sub grades may make the soil water repellent, interfering with long-term infiltration and the vegetation/re-vegetation on the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- Asphalt, as a mulch tack or chemical mulch, requires a 24-hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.

Implementation

General

Recently, the State Air Resources Control Board has, under the authority of the Clean Air Act, started to address air quality in relation to inhalable particulate matter less than 10 microns (PM-10). Approximately 90 percent of these small particles are considered to be dust. Existing dust control regulations by local agencies, municipal departments, public works department, and public health departments are in place in some regions within California.

Many local agencies require dust control in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. The following are measures that local agencies may have already implemented as requirements for dust control for contractors:

- Construction and Grading Permits: Require provision for dust control plants.
- Opacity Emission Limits: Enforce compliance with Colorado air pollution control laws.

- **Increase Overall Enforcement Activities:** Priority given to cases involving citizen complaints.
- **Maintain Field Application Records:** Require records of dust control measures from contractor;
- **Stormwater Management Plan (SWMP):** Integrate dust control measures into SWMP.

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures would include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph, and controlling the number and activity of vehicles on a site at any given time.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater.

Costs

Installation costs for water and chemical dust suppression are low, but annual costs may be quite high since these measures are effective for only a few hours to a few days.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Check areas protected to ensure coverage.
- Most dust control measures require frequent, often daily, or multiple times per day attention.

APPENDIX B

TIER 1 COGCC STORMWATER EXCLUSION CHECKLIST



Tier 1 COGCC Stormwater Exclusion Checklist

If **ALL** of the following questions are answered **YES**, the site is not subject to continuing stormwater inspections per the 1000 Series COGCC Rule amendments.

Is the slope is less than five percent?

Does the soil have low erosion potential?

Is the vegetative cover or permanent erosion resistance cover greater than seventy-five percent?

Is the distance from a perennial stream or Classified Water Supply Segment greater than five hundred feet?

Is the oil and gas location size less than one acre, measured by the amount of surface disturbance at the time of the termination of the construction stormwater permit issued by the Colorado Department of Public Health and Environment (CDPHE)?

APPENDIX C

EMPLOYEE TRAINING FOR STORMWATER BEST MANAGEMENT PRACTICES



EMPLOYEE TRAINING FOR STORMWATER BEST MANAGEMENT PRACTICES

What are Stormwater Best Management Practices (BMPs)?

- Each state has a governmental agency responsible for safeguarding public waterways to keep them free of pollution.
- Stormwater activities include runoff from oil & gas construction activities into public waterways (Streams, lakes, oceans, public drains, groundwater, etc). No potential pollutant should leave a site.
- As a result, facilities are required to implement stormwater management plans that include BMPs.
- Stormwater BMPs are those activities (berms, silt fence, wattle, etc.) that will help to prevent potential pollutants from leaving the site and entering our public waterways.
- Every employee is expected to understand and comply with all BMPs.

What types of pollution can be perceived as a release into public waterways?

- **Sediment** – Disturbed ground cover has a higher susceptibility to erosive forces than vegetated ground cover. ...a rain or storm event can carry pollutants from the site into the public waterways.
- **Non-Authorized Discharge** – Even when it doesn't rain the following types of activities can cause pollution to run-off into the public waterways: (1) Waters from the rinsing or washing of vehicles, equipment, buildings, or pavement, (2) Materials that have been improperly disposed of or dumped, & spilled, and (3) Leaking materials.

Best Management Practices that all employees are expected to follow

- **Good Housekeeping** – Keep you work area clean and organized
- **Preventative Maintenance** – If you see evidence of contamination on the ground or you see equipment that is leaking, notify the Environmental & Regulatory personnel to address the problem. Be particularly observant in areas where the slope grades off the property when checking structural integrity of BMPs. If you are working outside in the rain and you see puddles with oil slicks, be sure the slicks are contained and do not run-off the site.
- **Spill Response** – All spills need to be contained & cleaned up immediately. If you use absorbents, be sure they are disposed of properly. If you need assistance with a spill notify the Environmental & Regulatory personnel.
- **Material Handling & Storage** – When working with chemicals be sure they cannot spill to the ground by working over some type of containment or plastic sheets. Be sure all chemicals (oils, solvents, etc.) are stored in containers in good condition. When containers are not being used make sure they are covered. When transferring materials from one container to another take precautions to safeguard against spills. Drums with chemicals need to be stored inside a covered containment area with berms.
- **Waste Handling & Storage** – All waste containers need to be covered, and stored in a bermed controlled containment area. Any drums found leaking should be reported immediately.

SUMMARY – KEEP YOUR WORKSITE CLEAN.

APPENDIX D
POST-CONSTRUCTION INSPECTION REPORT



Post-Stormwater Management Program Compliance Inspection Form

Site I.D.: _____ Date: _____
 Location: Sec T N R W Inspector: _____
 Inspection Type: COGCC Stormwater Inspection Inspector Signature: _____
 Surrounding Vegetation Conditions: _____ Inspector Title: _____

OBSERVATIONS: Stormwater Runoff Risk: Low Med High

Current Weather: _____

BEST MANAGEMENT PRACTICE (BMP) CHECKLIST			
BMP TYPE			
Sediment Control	Required Action or Maintenance Needed	Location	Date Completed
Erosion Control	Required Action or Maintenance Needed	Location	Date Completed

PAD AREA OBSERVATIONS:	COMMENTS:
Have any spills or leaks occurred onsite (chemicals, water, tanks, etc.)? Y N	
Is pad area graveled (offsite tracking control)? Y N	
Is access road graveled (offsite soil tracking control)? Y N	
Are there any Good Housekeeping Issues? Y N	

GENERAL:	COMMENTS:
Has the outfall been impacted due to runoff? Y N	
Are there signs of sediment leaving the site? Y N	
Are there signs of offsite tracking at access point? Y N	

STORMWATER MANAGEMENT REQUIREMENTS (See Rule 1002.f):	
Is there a Post Construction Stormwater Program for this facility? Y N	
Have you inspected this facility in accordance with the established inspection schedule and determined that applicable BMPs are in place, and are maintained and operating properly? Y N	

ADDITIONAL COMMENTS:

Signature: _____