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EFFECTIVE	8/30/02
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STANDARD OPERATING PROCEDURE NO. 7105-01
Sediment Control During Open Channel Water Discharges

Purpose

This standard operating procedure SOP describes procedures to be used to minimize the transport of sediment to storm drains or receiving waters during open channel discharges containing sediment or having the potential to entrain sediments to satisfy the requirements of the Regional Water Quality Control Board and to protect the environment.

Scope of this Procedure

This procedure is not intended to cover all erosion control or sedimentation situations, but does apply to dewatering and related sediment control at SCWD work sites. Larger projects with sediment control needs should follow guidelines of the City's Urban Water Runoff Program.

Discharges Requiring Sediment Control

The sediment control procedures described herein must be used for all discharges from trenches during main or service break repair activities and any other Department activities that involve open channel discharges to the storm drain system or "receiving" waters with potential to mobilize and transport significant concentrations of sediment.

Exempt Discharges

The following discharges are exempt from these sediment control requirements:

- Unplanned discharges at unstaffed locations (e.g., reservoir overflows, main or service breaks prior to arrival of repair crew).
- Discharges to land – Any discharges to land that are absorbed into the ground and involve minimal or no runoff to storm sewers or receiving waters.
- Discharges of clean water along a clean flow path.
- Discharges within closed conduits.

Overview of Sediment Control Procedures

Sediment control is accomplished through implementation of several Best Management Practices (BMPs) including 1) use of vacuum truck to eliminate discharge, 2) filtration with pea gravel bags before discharge to storm drain, and 3) overland filtration. Residual sediment should be shoveled and either used as fill[1], or hauled off-site for appropriate disposal. Success of these procedures will depend on appropriate implementation.

Roles and Responsibilities

- Distribution Crew Leader is responsible for:
  - Determining method of dewatering
  - Contacting Water Resources Management staff for consultation and monitoring.
- Water Resources Management is responsible for:
  - Monitoring,
  - Determining necessity of further procedures for environmental protection.
  - Consultation with regulatory agencies (RWQCB, DFG, others as appropriate)[2].

[1] In areas of potential soil contamination (gasoline, etc.) refer to draft SOP #7105-02 for more information before determining appropriate course of action. This procedure for working with contaminated soils has yet to be developed.

[2] Reporting required as follows: Any discharge to surface waters requires notification to RWQCB within **24 hours.** Report to DFG should be made **in writing** within 14 days of beginning of **emergency** work. All dewatering work that is not emergency work should not involve any discharge to surface waters and therefore does not require a discharge permit but may require consultation with DFG, USFWS, etc. regarding biotic issues. See Attachment 1– Sample Notification Letter.

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Impacts of Sedimentation

Sedimentation (the result of discharge of soil laden water to surface, or "receiving" waters) causes degradation of aquatic habitat through filling pools and spawning gravels, limits respiration of aquatic life, and enriches receiving waters with nutrients; thereby increasing incidence of algae blooms.

Priority of Sediment Control Relative to Other Jobsite Tasks

For any activity involving dewatering and sediment control, jobsite tasks should be prioritized in order of the following concerns:

1. Worker Health and Safety (e.g. don safety gear, set up traffic control, identify any site contamination concerns).

2. Public Health & Safety (e.g., stop dewatering sediment control if flows into traffic are causing a hazard, or if delays in dewatering are resulting in an inability to repair a leaking main and ability to provide water).

3. Environmental Protection (e.g., set up dechlorination and/or sediment control equipment as necessary, ensure trench spoils are disposed of properly).

Sediment Control Equipment

- Turbidity Meter
- Data sheets (example: Attachment 3)
- Vacuum Truck
- Pea gravel bags
- Pea Gravel
- Flat Blade Shovel
- Container for residual sediment disposal
- Pump
- Screening for pump intake (if dewatering in presence of aquatic life)
  - 1/4 inch mesh on screening required for sites with aquatic life present[3].
- Straw and Seed[4]

Changes to Procedure

This is a formal procedure. Any previously released informal procedures are no longer acceptable and should be replaced with this SOP. This procedure may evolve over time as new sediment control technology or methods become available that make sediment control quicker, easier or more effective.

Related SOPs

Please reference SOPs # 7102-01-01, 7102-02 and 7102-04 for dechlorination and 7105-02[5] for contaminated soil disposal procedures.

[3]Sites with potential aquatic life present require consultation with Water Resources Management staff and possibly presence of a qualified biologist before work can be initiated. Any site on the North Coast requires consultation with Water Resources Management staff before initiation of work. Water Resources Management staff will consult with regulatory agencies before initiation of any work if possible in cases with aquatic life present. Tail gate meetings with biologist will be held at the beginning of every work day at such sites. Biologist has authority, within reason and with deference to Dept. priorities as stated in this SOP, to direct dewatering work such that impacts to aquatic life are minimized.

[4] Straw should be rice or barley straw. Seed should consist of a mix of red clover and barley or local native mix to be determined at time of application in consultation with Water Resources Management Section.

[5] This procedure for working with contaminated soils has yet to be developed.

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Scenario	Procedure
1. Dewatering in vegetated, rural setting.	1. Ascertain that aquatic life is not present in ponded water *(for example repairs of leaks on the North Coast*[5] *require consultation with Water Resources Management staff before dewatering or other work can begin).* 2. Screen pump with ¼ inch mesh if frogs or fish are present. If they are not present, screening is not required. 3. Locate end of discharge pump hose into pea-gravel filled filter fabric bag for energy dissipation for discharge overland. Discharge should not cause erosion or transport sediment to <u>any</u> nearby surface waterbody. Discharge should be as far from nearest waterbody as possible and located on flat, well vegetated ground if possible. 4. Pump as necessary, ascertaining that discharge water is not eroding soil and that sediment is settling out of discharge water before entering any surface water. 5. Collect samples upstream and downstream in receiving waters throughout procedure if work site is near any surface water body. Document turbidity and discharge volume.[6] 6. Follow up with straw/seed soil stabilization as necessary immediately following completion of work, or prior to the end of the day if the U.S. Weather Service forecast is a "chance" (30% or more) of rain before the next day, and prior to weekend or other shutdown periods during winter months (October 15 – April 15).
2. Dewatering trench in a paved, urban setting *with* vacuum truck available.	1. Call Public Works to secure vacuum truck for end-hauling of water to wastewater treatment plant. 2. No further action required for dewatering if no discharge exists.
3. Dewatering trench in a paved, urban setting *without* vacuum truck available.	1. Remove debris (sediment, branches, garbage, etc.) from discharge flow path. If the discharge is caused by a main or service break and there is surface flow, isolate the main or service prior to excavation if it is appropriate to do so based on standard main or service break repair procedures. Once the surface flow is stopped, remove all sediment and debris from the flow path. If there is surface flow and debris is present, remove debris if it can be removed without causing it to become entrained in the flow. For breaks where there is no surface flow (street is dry) or for main dewatering or other clean water discharges, inspect the flow path between the flow source and discharge location (the storm drain or receiving water the flow will discharge to). Remove any debris or accumulated sediment from the flow path. 2. Place pea gravel bags in flow path and around nearest downslope storm drain[7]. Beware of safety issues related to ponded water on pavement and place traffic cones around perimeter of ponded water. 3. Begin pumping. 4. Check pea gravel bags periodically to ensure they are staying in place and performing their function. If the sediment has built up behind pea gravel bags, remove sediment as necessary if an opportunity occurs (flow has temporarily ceased). Do not attempt to remove sediment during discharge. Do not allow accumulated sediment to enter storm drain. 5. Collect sample(s) of water being discharged to storm drain throughout the process

[6] See Attachment 2– Map
[7] See Attachment 3 – Data Sheet.
[8]See Attachment 4 – Pea Gravel Bag Dam Layout

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	(after it has drained through pea gravel bags) and document estimated discharge volume and turbidity. 6. Conclude pumping, when discharge is complete, allow any water that is ponded behind the pea gravel bags to drain, then shovel as much sediment as possible into backhoe bucket or other available container. Hose down remaining sediment on pavement ensuring that flow of this cleanup water drains to pea gravel bags at downslope stormdrain. When hosing is complete, allow any water that is ponded behind the pea gravel bags to drain. Retrieve all equipment and store in appropriate field vehicle(s). Haul residual sediment off-site for disposal or use as fill on-site. Empty the sediment and debris from the backhoe bucket or container into the dump truck if available. Otherwise, the sediment may be 1) spread out on an appropriate unpaved ground locally, if an appropriate location exists, 2) transported to a City facility and deposited on an appropriate unpaved surface, if an appropriate location exists, 3) added to open trench spoils bins, or disposed of in a dumpster. Non-sediment debris must be disposed of in a dumpster or garbage can.[9]
Regulatory Agencies	• Central Coast Regional Water Quality Control Board (RWQCB) • United States Environmental Protection Agency (USEPA) • United States Fish and Wildlife Service (USFWS) • National Marine Fisheries Services (NMFS) • California Department of Fish and Game (DFG) • Santa Cruz County Planning • City of Santa Cruz
Applicable Regulations	• Federal Clean Water Act • County of Santa Cruz Water Quality Ordinance • California Water Code • Endangered Species Act
Attachments	1. Sample Agency Notification Letter 2. Map 3. Data Sheet 4. Pea Gravel Bag Layout
References	• EBMUD Environmental Compliance Manual • Central Coast Basin Plan

[9] In areas of potential soil contamination (gasoline, etc.) refer to SOP #7105-02 (yet to be developed) for more information before determining appropriate course of action.

Attachment 1 – Sample Notification Letter

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Watershed Resources Management – 715 Graham Hill Rd.- Santa Cruz, CA 95060

Ms. Regulator
123 Old Logging Road Way
Santa Rosa, CA 90666

September 19, 2001

Dear Regulator,

Thank you for your consideration of our emergency repair work on the City's North Coast water main during the week of July 30 – August 3, 2001. This work was precipitated by a significant leak in the north coast raw water main and was necessary to maintain drinking water supply to the City from the north coast sources. In brief, this work included pumping of ponded water from the leaking pipeline and groundwater that seeped into a hole (which had been excavated by the leak) approximately 10 ft. across and 10 feet deep, excavation and replacement of the failed section of pipeline and filling of the hole. This repair work occurred in the riparian zone on the east side of Old Dairy Gulch just south of Highway 1 on, and in the vicinity of, the City's pipeline easement through APN 00-001-045. The City hired Green Construction to complete this repair. As you requested, I have compiled the following information regarding this work.

- July 30, 2001: 6,000 gallons of water pumped from the hole by the Santa Cruz Water Department (SCWD) and discharged into vegetation such that sediment would settle out. Discharge was dissipated by directing discharge into strawbale staked into crotch of mature willow tree.

- July 31, 2001: 2,000 gallons of water pumped from hole by Green Construction and discharged into vegetation such that sediment would settle out. Discharge was dissipated by directing discharge into strawbale staked into crotch of mature willow tree.

- August 1, 2001: 4,000 gallons of water pumped from hole by Green Construction and discharged into vegetation such that sediment would settle out.

- At approximately 7:30 am on this day I encountered Green Construction discharging turbid water pumped from the hole directly to Old Dairy Gulch and informed them that this was unacceptable. The foreman immediately moved the discharge line to a site with vegetative filter capacity. As Green Construction crews had only been on site for approximately half an hour at that point and the discharge was occurring at 400 gallons/hour, no more than 200 gallons of turbid water was discharged directly to the creek. Discharge was dissipated by directing discharge into strawbale staked into crotch of mature willow tree.

- August 2, 2001: 1,600 gallons of water pumped from hole by Green Construction and discharged into vegetation 100 feet from Old Dairy Gulch on 1-3% slope such that sediment would settle out. Discharge was dissipated by directing discharge into strawbale staked into crotch of mature willow tree.

- All water pumped from the hole was turbid. This suspended sediment was composed of native material deposited by the creek in the riparian zone of this low gradient reach of Old Dairy Gulch. Though discharge water surely still had some fines suspended when it entered creek, deposition of the bulk of the suspended sediment in the vegetation at the discharge point was successful. Discharged water appeared clear as it passed from the riparian vegetation into the creek.

Attachment 1 is documentation of biological surveys and work related to California Red Legged Frogs performed by Rana Aurori – the wildlife biologist who was retained by the City to assist us with this project. Attachment 2 is data collected during the project characterizing water quality of the discharge, and environmental conditions of the site upstream and downstream of the point of discharge. Attachment 3 illustrates the plan for restoration of the site disturbed by this work. The property owner's botanist, Danthonia Californica, has approved this plan. Attachment 4 is the project site location map. Finally, we are in the process of obtaining necessary permits for this work from the County of Santa Cruz as well as other relevant agencies.

Thank you again for your consideration. If you have any questions please feel free to call me at 420-5483.

Sincerely,

SCWD Water Resources Manager

cc: read file, SCWD Operations Manager,USFWS, DFG, NMFS, RWQCB, SCCO Planning

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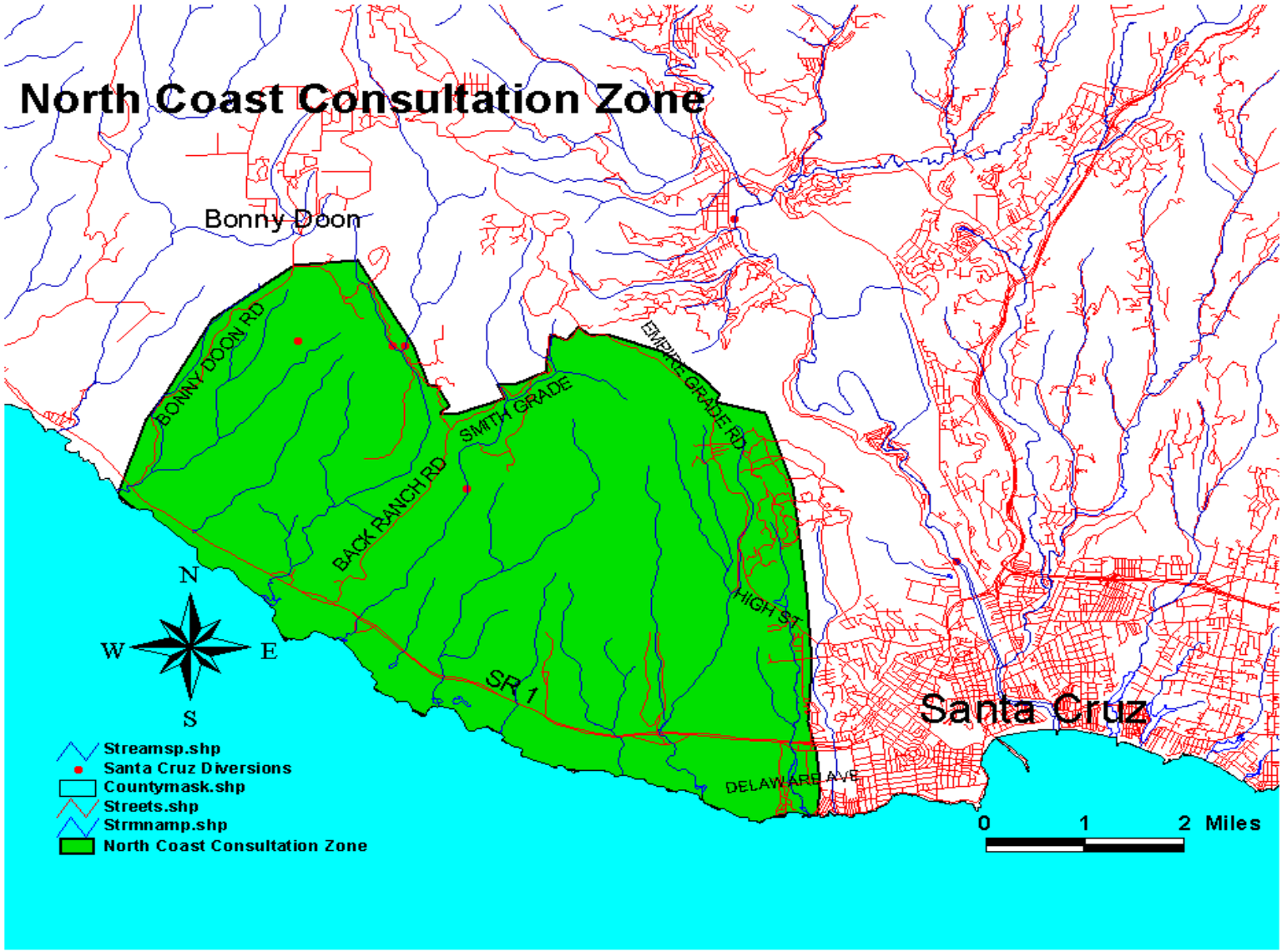
Attachment 2 – Map



Attachment 3 – Data Sheet

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DEWATERING DATA	DESCRIPTION	UNITS	LIMIT	SAMPLE
	Chlorine residual	mg/l	0	
	Turbidity	NTU	1. Where natural turbidity is between 0 and 50 units, increases shall not exceed 20 percent. 2. Where natural turbidity is between 50 and 100 units, increases shall not exceed 10 units. 3. Where natural turbidity is greater than 100 units, increases shall not exceed 10 percent.	
Discharge	pH	NA	6.5-8.5	
	Temperature	Degrees Celsius		
	Volume	gallons		
	Chlorine residual	mg/l	0	
	Turbidity	NTU	See above	
Upstream	pH	NA	6.5-8.5	
	Temperature	Degrees Celsius		
	Presence of aquatic life?	Y/N		
	Presence of visible sheens, films, discoloration?	Y/N		
	Presence of erosion or sediment transport or % embeddedness	Y/N or %		
	Chlorine residual	mg/l	0	
	Turbidity	NTU	See above	
Downstream	pH	NA	6.5-8.5	
	Temperature	Degrees Celsius		
	Presence of aquatic life?	Y/N		
	Presence of visible sheens, films, discoloration?	Y/N		
	Presence of erosion or sediment transport or % embeddedness	Y/N or %		
Date: Time: Sampler's Initials:		Notes:		Weather:

Attachment 4 – Pea Gravel Bag BMP

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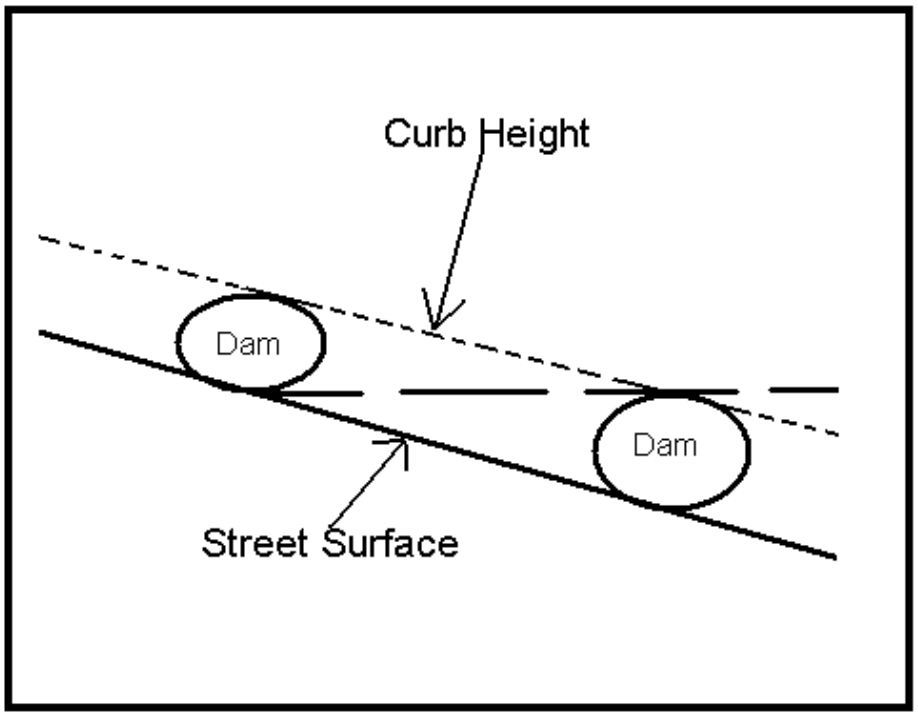
Pea gravel bags dams surrounding storm drain inlet. Discharge should be interrupted and settled sediment removed before it is transported over dams into storm drain.



Pea gravel bag dams place in path of water flow to storm drain inlet. Dam spacing dependent on slope (i.e. in order to achieve orientation as above must be placed more closely together on steep slopes).