

REVISED POSTCLOSURE MAINTENANCE PLAN

Caspar Refuse Disposal Site

End of Prairie Way

Caspar, CA 95420

SWIS: 23-AA-0003

PREPARED FOR:

County of Mendocino
Department of Transportation
340 Lake Mendocino Drive
Ukiah, CA 95482

PREPARED BY:



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May 29, 2015 (Revised May 11, 2017)

STATEMENT OF COMPLETION

This revision to the Postclosure Maintenance Plan (Plan) was prepared for the Caspar Refuse Disposal Site in the community of Caspar, California. The Plan revision was prepared under my direction in accordance with Title 27 of the California Code of Regulations (27 CCR). I am familiar with the individuals and engineering firms responsible for obtaining the information provided in this Plan revision and it represents complete and accurate information, to the best of my knowledge.



Stephen V. Huvane, P.E.



Date: 5/11/2017

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1.0 INTRODUCTION

1.1 Purpose and Operator Information

The Postclosure Maintenance Plan (PCMP) for the Caspar Refuse Disposal Site (Landfill) (Site) is herein revised as requested by the County of Mendocino Environmental Health Division, the Local Enforcement Agency (LEA) for the California Department of Resources Recycling and Recovery (CalRecycle) in their letter dated November 8, 2013.

The original PCMP was included in the *Final Closure and Phase 1 Corrective Action Plan* prepared by SHN Consulting Engineers & Geologists (SHN), dated August 1993. This document supersedes the portions of the document pertaining to postclosure maintenance, and is revised in accordance with Section 21890 of Title 27 (27 CCR 21890) of the California Code of Regulations.

In accordance with 27 CCR 21830, the purpose of a PCMP is to provide a basis for the Operator to establish an accurate detailed cost estimate for postclosure care of the landfill, to be certified by a Registered Civil Engineer in the State of California, and to provide a detailed plan for the inspection, maintenance and monitoring of the landfill during the postclosure maintenance period. The cost estimate is included as Table 1.

The Site is owned and operated by the County of Mendocino Department of Transportation (County) (Operator). The County is responsible for all aspects of landfill postclosure maintenance. The Operator contact information is as follows:

Mr. Geoffrey Brunet, P.E.
County of Mendocino
Department of Transportation
Land Improvement
340 Lake Mendocino Drive
Ukiah, CA 95482
(707) 463-4566
brunetg@co.mendocino.ca.us

Postclosure activities are performed in accordance with the applicable regulatory standards presented in CCR Title 27, Sections 21090, 21180, and 21830. Postclosure activities consist of groundwater, leachate, surface water, stormwater and landfill gas monitoring; as well as observation and maintenance of the final cover, drainage structures, site security, and environmental monitoring systems. The landfill will be in the postclosure period for 30 years from the completion of closure in 1994, or as otherwise determined to be necessary by the applicable regulatory agencies. Copies of this PCMP will be maintained at the local office of the Operator throughout the postclosure period.

1.2 Site Description and History

As shown on Figure 1, Site Vicinity Map, the Site is located in the community of Caspar approximately 7 miles southeast of the City of Fort Bragg. Access to the Site is by Prairie Way (County Road 561A), approximately 1.5 miles east of Highway 1. The landfill occupies approximately 16 acres in the northern portion of two parcels totaling 65 acres.

The Caspar Landfill began operations in July of 1967. Most of the waste was placed above grade, but the original operation included trenches where the waste was piled and burned,

then covered with the excavated soils. After 1977, the operation had been an area fill, with no new excavations occurring below native grades (due to high groundwater conditions). Disposal operations were ceased in October 1992, and approximately 2 feet of intermediate cover soil was applied. The landfill was closed in 1994. Final landfill slopes are generally 3 horizontal: 1 vertical (3H:1V) and 30 to 50 feet in height.

2.0 POSTCLOSURE MAINTENANCE PLAN

2.1 Responsible Parties

Mr. Geoffrey Brunet, P.E.
County of Mendocino
Department of Transportation
Land Improvement
340 Lake Mendocino Drive
Ukiah, CA 95482
(707) 463-4566
brunetg@co.mendocino.ca.us

2.2 Planned Uses of Property During Postclosure Maintenance Period

Postclosure land use of the landfill will continue to be non-irrigated vegetated open space. A portion of the Site adjacent to the landfill is currently being utilized for the operation of a transfer station. The transfer operations will be discontinued and the station facilities will be removed if and when an alternative transfer station is sited.

2.3 Environmental Monitoring and Control Systems

The monitoring and control systems at the landfill include those for groundwater, leachate, surface water, stormwater and landfill gas migration. A leachate collection toe drain system was installed at the time of closure. All landfill environmental monitoring and control systems are shown on Figure 4 and described in detail below.

2.3.1 Groundwater

The groundwater monitoring system is comprised of nineteen (19) monitoring wells and two (2) piezometers. Monitoring well construction data is summarized in Table 2. Well logs and construction diagrams are provided in Appendix B. Although not part of the facility's monitoring and reporting program, six (6) residential wells near the landfill are also routinely monitored.

Descriptions of the groundwater monitoring system will be kept current throughout the postclosure maintenance period by submittal of updated description of when the system is modified. Groundwater monitoring is performed in general accordance with the North Coast Regional Water Quality Control Board, (RWQCB) Waste Discharge Requirement (WDR) Order No. 93-83.

Table 3 presents the current analytical parameters and monitoring frequencies for groundwater.

During the postclosure maintenance period, the physical condition of each monitoring well will be inspected for signs of failure and wear. Worn or failed equipment, such as well

caps and sample tubing, will be replaced as necessary. The dedicated pumps will require periodic servicing and repair consistent with the pump manufacturer's suggested maintenance schedule, or replacement if necessary. While not anticipated, it is assumed that all groundwater monitoring wells and piezometers will require replacement at some point during the 30-year postclosure maintenance period.

At the conclusion of the postclosure monitoring period, the monitoring wells will be decommissioned if requested and authorized by RWQCB. The wells will be decommissioned according to local and state regulations.

2.3.2 Surface Water and Stormwater

As shown on Figure 3, there is one (1) retention basin at the Site. Surface water is sampled and analyzed annually at 2 locations: SW-1) located in a drainage swale near monitoring well 87-1, southeast of the landfill; and SW-2) located approximately 300 ft west of the northwest corner of the site in a drainage swale on the Fontaine property.

As of July 1, 2015, stormwater sampling will be performed in accordance with the State Water Resources Control Board (SWRCB) General Permit for Discharges of Stormwater Associated with Industrial Activities Order No. 2014-0057-DWG (IGP). The IGP requires sampling of stormwater four times per year (twice before December 31 and twice after January 1). Stormwater sampling at the Site is performed at the same locations as surface water shown on Figure 3 and described above.

Table 3 presents the current analytical parameters and monitoring frequencies for surface water and stormwater.

Descriptions of the surface water and stormwater monitoring system will be kept current throughout the post closure maintenance period by submittal of updated descriptions when the system is modified.

2.3.3 Landfill Gas

The current landfill gas (LFG) monitoring system consists of five (5) perimeter monitoring probes. Passive venting gas control system was installed as part of the final cover to prevent lateral migration. A detailed discussion of the passive LFG venting system design is contained in Section (a)(5)(A)K, and presented on Sheet 6, of the *Final Closure and Phase 1 Corrective Action Plan* prepared by SHN, dated August 1993.

Descriptions of the LFG monitoring system will be kept current throughout the postclosure maintenance period by submittal of updated descriptions when the system is modified. Methane concentrations at the perimeter LFG monitoring probes are measured and reported quarterly in accordance with 27 CCR 20933.

During the postclosure maintenance period, the physical condition of each monitoring probe will be inspected for signs of failure and wear. Worn or failed equipment, such as valves and tubing, will be replaced as necessary. While not anticipated, it is assumed that all LFG monitoring probes will require replacement at some point during the 30-year postclosure maintenance period.

At the conclusion of the postclosure monitoring period, the monitoring probes will be decommissioned if requested and authorized by LEA and CalRecycle. The probes will be decommissioned according to local and state regulations.

2.3.4 Leachate

Leachate is collected from the leachate collection toe drain system that flows by gravity to a “tank farm” comprised of 12 tanks located along the west side of the property as shown on Figure 3. One (1) sample of the leachate is obtained from the tanks and analyzed annually.

When a sufficient volume of leachate has been collected, the leachate is hauled by truck to a POTW operated by the City of Fort Bragg.

During the postclosure maintenance period, the physical condition of the leachate collection system and containment facility will be inspected for signs of failure and wear. Worn or failed equipment, such as connecting pipes and valves, will be replaced as necessary.

2.4 Landfill Cover Monitoring

The purpose of landfill cover monitoring program is to insure that the final landfill closure cap continues to perform as a hydraulic barrier, minimizing the volume of leachate that will be generated by stormwater runoff percolation into the underlying refuse materials.

The landfill cover system will be monitored quarterly during the postclosure maintenance period, and after all major storms and earthquakes. The monitoring program will include general monitoring, vegetative growth monitoring, and settlement monitoring, as described below. Any required maintenance of the final cover system will be conducted by County personnel.

The final landfill cover at the Site consists of an 18” of vegetative soil over a geotextile or geocomposite drainage layer, 40-mil geomembrane barrier layer and 6” sand cushion. A detailed discussion of the final landfill cover design is presented in Section (a)(5)(A)D, and shown in detail on Sheet 6, of the *Final Closure and Phase 1 Corrective Action Plan* prepared by SHN, dated August 1993.

General Monitoring

The landfill cover system will be monitored by conducting visual inspections. Damaged areas will be investigated to determine the cause of the damage before repairs are made. The landfill cover area will be inspected for the following:

- erosion
- poor vegetation growth
- ponded water
- odor
- exposed refuse
- cracks
- settlement
- slope failure, and
- leachate seeps

Significant cracks identified in the vegetative soil layer will be sealed. Erosion damage caused by extremely heavy rainfall will be repaired as soon as weather conditions allow. Temporary measures such as berms, ditches, and straw mulch will be used to prevent

further erosion of the vegetative soil layer. Repairs may include replacing the eroded soil, re-seeding, re-grading, and installing additional drainage controls, among others.

Repair of landfill cover materials should be performed in a manner consistent with the layers placed during the original final cover construction and tested in general accordance with the CQA Plan (Appendix G of the *Final Closure and Phase 1 Corrective Action Plan* prepared by SHN, dated August 1993).

The following cover distress features are required to be repaired:

- Penetration into or through the final cover associated with installation or maintenance of the LFG control system, such as additional passive vents.
- Settlement related sags and drainage interruptions that interfere with the controlled flow and discharge of stormwater from the closed landfill surface.
- Local surficial slumping on slopes.
- Significant cracking and erosion of the cover.

Cover Penetrations - Penetration of the final cover associated with installation or maintenance of LFG or other control systems should be avoided whenever possible. If foundation layer placement and compaction cannot be adequately performed around the penetration using hand operated mechanical tampers, hand compaction can be performed for a plug consisting of 1 part bentonite powder and 9 parts final cover soil. The plug thickness should equal the distance from the top of the foundation layer to the waste surface. A 40-mil geomembrane layer will be booted to any penetration pipe as indicated on Sheet 6 of the *Final Closure and Phase 1 Corrective Action Plan* by SHN, dated 1994. The disturbed area will be covered by 18 inches of cover soil and compacted.

Settlement and Surficial Slumping - Repair of significant depressions in the final cover will be completed in the landfill area prior to the start of the rainy season (October 1). If significant depressions or ponds are identified during the rainy season, an Operator representative will locate the limits of the depressions and have a channel capable of draining the lowest point of the depression constructed, or will have additional cover soil placed in the depression such that the flow of surface water is unimpeded. The Operator will be responsible for assuring that fill placement occurs only in the area of the depression; that only fill which is necessary to facilitate drainage is placed, and that sufficient record of the depths and limits of fill placement are kept. The depth and limit records should be available so that the appropriate area can be re-excavated and permanently repaired, if necessary, as discussed below.

The repair of depressions and ponding, when necessary, will be performed by scarifying the surface of the final cover and filling and compacting the low area with soil similar to that used in the cover construction as required to match the surrounding slope. In areas of drainage interception and surface erosion, reconstruction will be consistent with the materials and practices utilized during closure construction.

After the annual rainy season, surficial slumping will be repaired. In areas where distress is limited to the upper vegetative soil layer of the final cover system, the slide debris will be removed to firm undisturbed soil and re-compacted. Soil removal may need to be extended beyond the visibly disturbed limits of the slump in order to include distressed areas that have not yet showed signs of slumping. Each layer of the final cover within the distressed areas must be repaired in conformance with the specifications set forth in the closure construction

documents. As discussed below, large and small slump areas will require different methods of repair.

Large Areas: If the repair area is accessible to track-type equipment, the loose soils can be removed and the exposed area will be scarified, moisture conditioned, and track walked to achieve compaction. The removed soils should be dried or watered to the design moisture content, as required, and placed in 8-inch loose, un-compacted lifts parallel to the angle of the slope. Each lift should be compacted by the equipment to at least 90 percent of maximum dry density. If the 40-mil geomembrane is damaged or has settled, the 40-mil geomembrane layer may need to be removed and the foundation layer re-constructed and/or re-compacted to match surrounding foundation layer grades. A 40-mil geomembrane patch should be placed in accordance with the CQA Plan (Appendix G of the *Final Closure and Corrective Action Plan* by SHN). The disturbed 40-mil geomembrane area should be covered by 18 inches of cover soil with and compacted. When grade is reached, track walking of the final lift should extend beyond the perimeters of the distressed area. For large areas, damaged geosynthetic LFG transmission and drainage layers will also be repaired with similar materials in accordance with manufacturer's instructions.

Small Areas: In lieu of using large construction grading equipment, hand labor for restoration of the slope may be used. The loose or saturated soils should be removed and a level bench should be cut into competent material at the base of the slump. The removed soils should then be brought to the design moisture content (wetting or drying, as required), placed in horizontal lifts of no more than 6 inches and compacted by hand operated mechanical tampers. As the fill is raised, it should be keyed into competent material with a series of horizontal benches. If the 40-mil geomembrane layer is damaged, the procedures described above should be used for repair of the 40-mil geomembrane and/or foundation layer.

Cracking - The cover layer may exhibit cracks due to differential settlement or soil creep on the slopes. The depth of the crack should be evaluated to determine if there is any damage to the 40-mil geomembrane layer. If the crack is isolated to the cover layer, the crack may be filled with cover soil and hand compacted.

If the cracks are more severe, the repair methods discussed above for slumping, or an alternative repair method recommended by a registered Civil Engineer or Engineering Geologist, will be used.

Vegetative Growth Monitoring

The vegetation growing on the final cover system is designed to protect the final cover system from erosion. If damage to the vegetative growth is observed, an investigation of the cause will be undertaken. If caused by erosion, the area will be repaired and re-seeded if necessary. If caused by landfill gas surface emission, additional passive venting may be required.

The following landscape maintenance procedures will provide guidance for proper monitoring and maintenance of the vegetative cover. Postclosure activities that are most integral to the maintenance of the vegetative cover include rodent control, fire control and re-seeding.

Rodent Control - During the postclosure maintenance period, rodent activity at the Site will be monitored on a quarterly basis. If excessive rodent activity is observed, rodent control measures will be implemented as needed. Rodent control measures will include extermination

by poison or gas, and collapse of burrows. Rodent control measures will be undertaken in a manner that does not harm endangered wildlife in accordance with State and Federal laws.

Fire Control - Several paved and dirt roads provide access around the perimeter and top of the landfill. Grass fires can occur for many reasons as a result of heavy vegetation and excessive weed naturalization. Mowing and disking removes heavy thatch and increases the organic content of the soil. To avoid damaging the landfill cover, fire breaks can be made by mowing. Disking can be performed on surrounding landfill buffer areas. Mowing and disking activities will be performed if requested by the County Fire Department.

Re-seeding - Once vegetation has been established, re-seeding should not be necessary to maintain adequate erosion control. If needed for large-scale repairs, the recommended seed mix is described in Section (a)(5)(A)H of the *Final Closure and Phase 1 Corrective Action Plan* by SHN, dated August 1993. To take advantage of seasonal rainfall, re-seeding in the fall and early winter months is recommended. Available water for the germinating seeds is retained for longer periods and allows for fast root growth. Re-seeding should not be performed during early summer months or during freezing conditions.

Settlement

Landfill settlement is caused by gradual compression of the landfill waste mass over time, and is expected to occur throughout the landfill postclosure maintenance period. Generally, landfill settlement decreases over time and is expected to occur uniformly over the flat top deck. Significant differential settlement could be caused by subsurface subsidence or slope failure, and could result in local depressions that could hold stormwater runoff (ponding) or damage to surface drainage control systems. Settlement repairs generally require placement of minimal fill soil to re-establish the surface grades.

The requirement for producing and submitting a Five-yearly Iso-settlement Map per 27 CCR 21090(e)(2) has been waived by RWQCB.

2.5 Drainage System

The drainage control system consists of overside drains, culverts, berms, earthen ditches, and a retention basin. The small amount of upgradient surface water that runs onto the Site is captured by the earthen ditch located on the east side of the Site's perimeter access road. The stormwater is then conveyed around the landfill, along the northern border of the Site, and eventually into Doyle Creek.

Runoff from the top deck is captured by earthen berms at the perimeter of the top deck and conveyed down the sideslopes by overside drains. The overside drains discharge onto energy dissipators and into the perimeter ditch at the toe of the landfill.

Standard maintenance of the drainage conveyance system will consist of removal of sedimentation deposits or debris to maintain free flow conditions. If present, sedimentation will be removed from drainage ditches on an annual basis during the summer and whenever ditch flow is restricted. Removal of sediment may be performed by hand with a shovel or by using a small loader or grader. Sedimentation material may be stockpiled onsite and used for erosion and cover repairs.

During abnormally heavy rainfall events, ditch side slopes may be eroded and damaged resulting in the ditch not adequately directing runoff flow. Sand bags or hay bales can be used to provide temporary reinforcement until the weather and site conditions allow for the soil and geotextile fabric (if used) around the drainage ditch to be replaced and re-compacted.

If differential settlement affects proper runoff control, repairs will be made to restore slope and flow.

2.6 Site Security

During postclosure, unauthorized access by persons and vehicles will be discouraged by perimeter barriers (fences with locked access gates) in accordance with 27 CCR 20530. The condition of all fences, gates, locks and signage will be monitored quarterly during the postclosure maintenance period. Any damage to the Site security system due to vandalism or natural wear and tear will be immediately repaired or replaced. Repairs will be made using materials consistent with the original materials and in a manner to maintain security of the Site. Signage will be repaired or repainted every 5 years in order to maintain their visibility. Any damage to the final cover or surface water drainage system due to trespassing of unauthorized vehicles will be repaired immediately in order to reduce the potential for future erosion and ponding.

3.0 POSTCLOSURE EMERGENCY RESPONSE PLAN

The Emergency Response Plan (ERP) is presented in Appendix C. The ERP describes the procedures to be followed at the landfill if an emergency occurs and lists the appropriate contact personnel.

4.0 POSTCLOSURE MAINTENANCE COST ESTIMATE

Estimated Postclosure Maintenance Costs are presented on Table 1. Average Annual Postclosure Maintenance Costs are estimated to be approximately \$169,000.

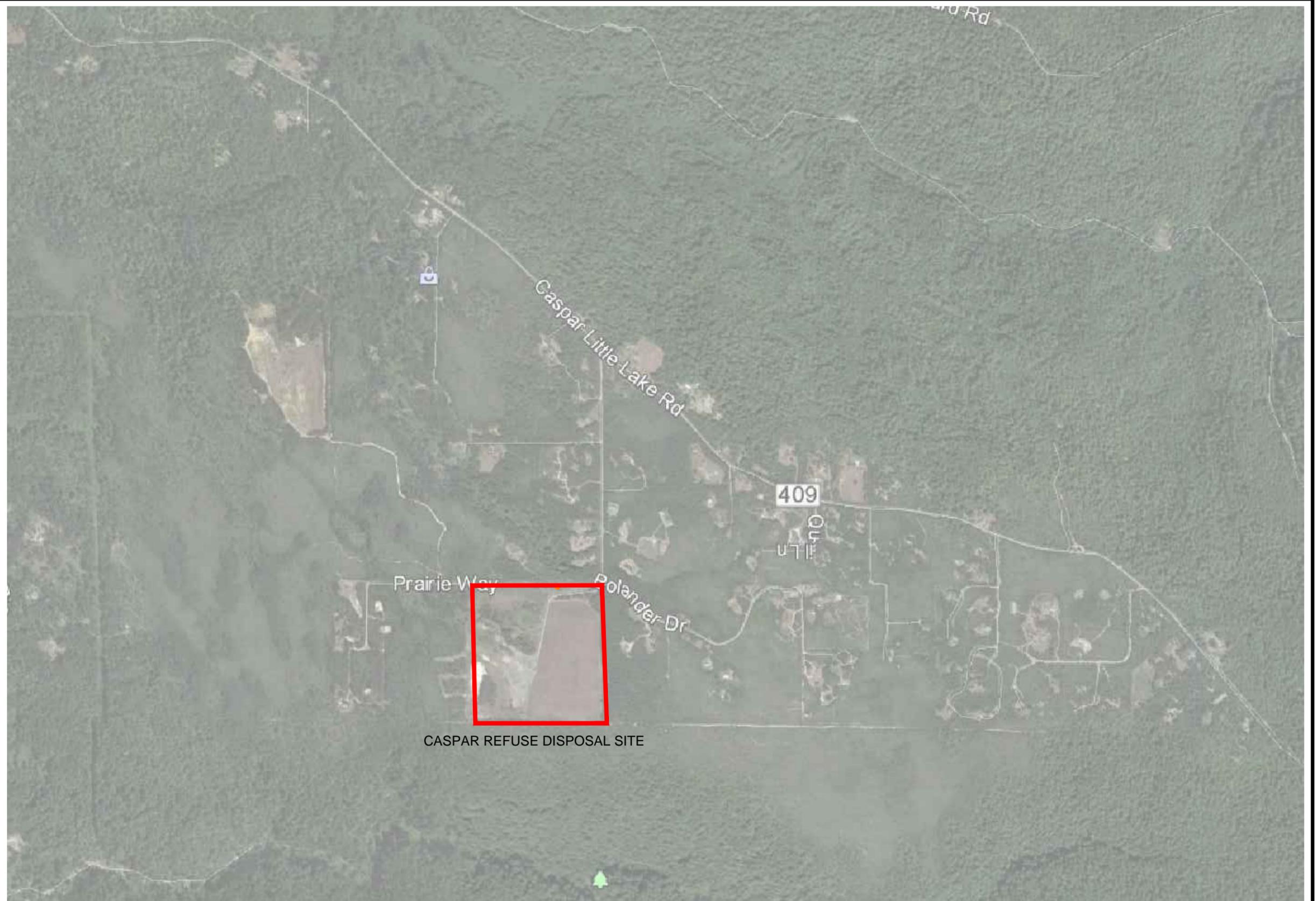
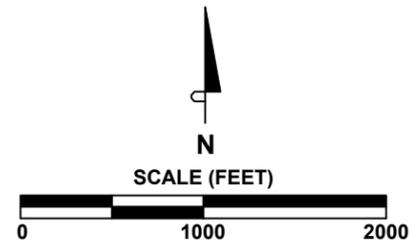
5.0 FINANCIAL ASSURANCE

A description of the financial assurance mechanism to assure that adequate funds are available postclosure maintenance will be provided by the Operator, and submitted separately, upon approval of this PCMP and associated cost estimate.

FIGURES

LEGEND

 PARCEL BOUNDARY



10680 WHITE ROCK ROAD SUITE 100
RANCHO CORDOVA, CALIFORNIA

T:916.366.0632
F:916.366.1501

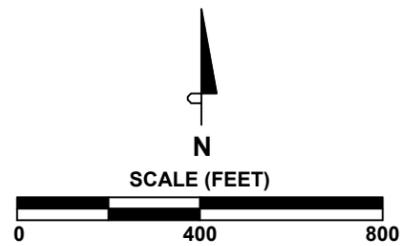
TITLE	SITE VICINITY MAP
PROJECT	CASPAR REFUSE DISPOSAL SITE CASPAR, CALIFORNIA

FIGURE:

1

LEGEND

- PARCEL BOUNDARY
- LEACHATE CONTAINMENT FACILITY
- ROAD
- TRANSFER STATION



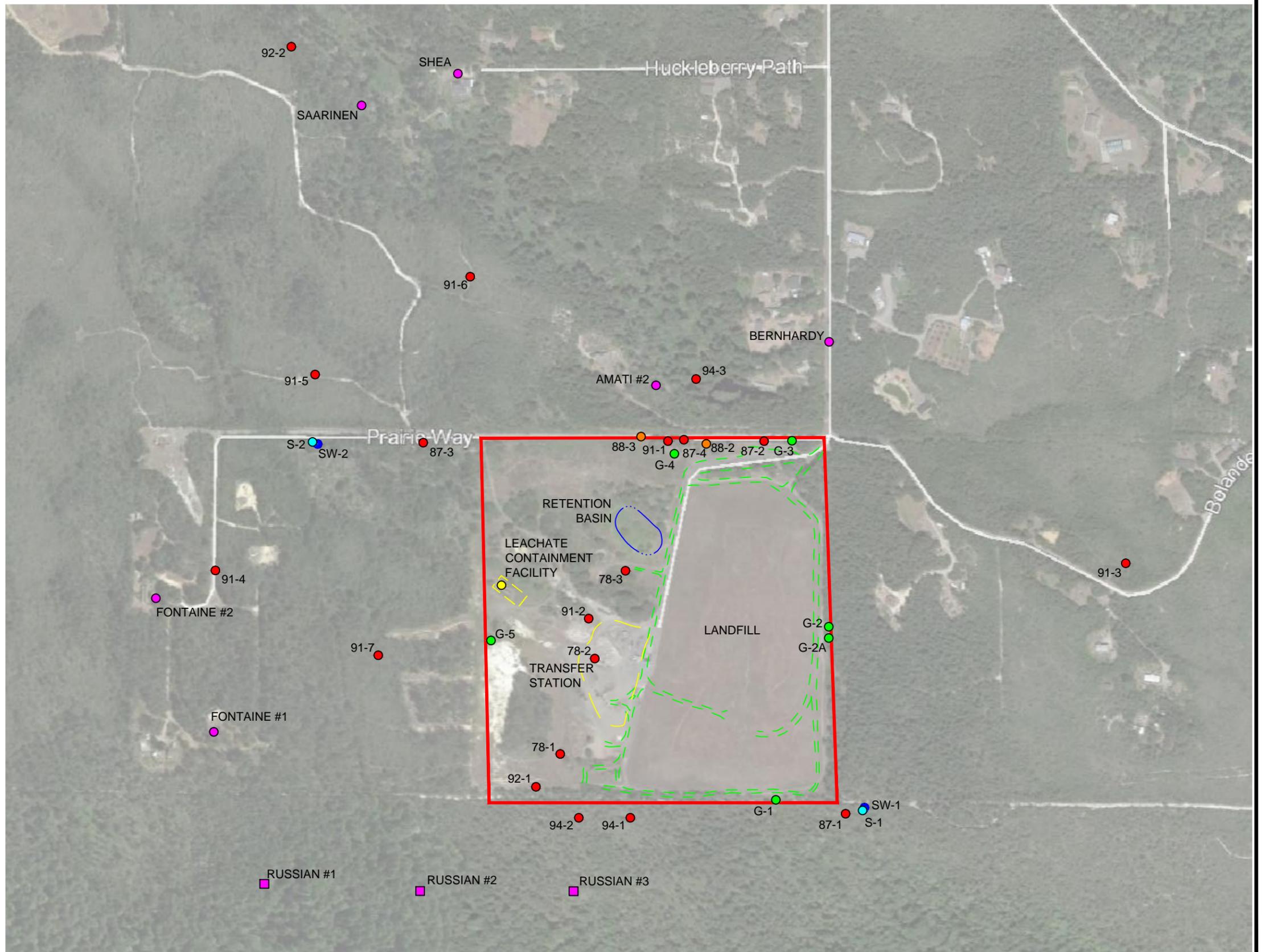
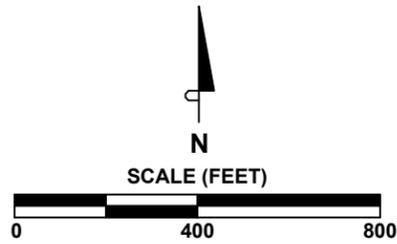
10680 WHITE ROCK ROAD SUITE 100
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 F:916.366.1501

TITLE SITE PLAN
PROJECT CASPAR REFUSE DISPOSAL SITE CASPAR, CALIFORNIA

FIGURE:
2

LEGEND

- SURFACE WATER MONITORING POINT
- STORMWATER MONITORING POINT
- GROUNDWATER MONITORING WELL
- GROUNDWATER PIEZOMETER
- LEACHATE MONITORING POINT
- GAS MIGRATION PROBE
- RESIDENTIAL WELL
- RUSSIAN GULCH STATE PARK SPRING MONITORING STATION
- PARCEL BOUNDARY
- LEACHATE CONTAINMENT FACILITY
- ROAD
- TRANSFER STATION



10680 WHITE ROCK ROAD SUITE 100
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TITLE ENVIRONMENTAL MONITORING PLAN	FIGURE: 3
PROJECT CASPAR REFUSE DISPOSAL AREA CASPAR, CALIFORNIA	

TABLES

Table 1
POSTCLOSURE COST ESTIMATE
Caspar Refuse Disposal Site

<i>ITEM</i>		<i>Annual Cost</i>
<i>No.</i>	<i>ITEM</i>	
1	Landfill Maintenance ¹	
	Weed Abatement (Mowing/Disking for Fire Prevention)	\$ 6,876
	Site Security (Fence Repair, Gates, Locks, etc.)	\$ 500
	Final Cover/Drainage Repairs and Erosion Control	\$ 5,202
	Labor and Administration	\$ 9,888
	Equipment and Supplies	\$ 500
	SUBTOTAL	\$ 22,966
2	Ground, Surface Water, Stormwater and Leachate Monitoring	
	Sampling ⁵	\$ 15,650
	Sampling Equipment ²	\$ 4,000
	Laboratory Costs (See Table 4)	\$ 31,444
	Reporting ⁶	\$ 17,320
	Equipment (Includes Vehicle and Mileage)	\$ 2,000
	Well/Piezometer Replacement ⁷	\$ 2,856
	Well/Piezometer Decommissioning ⁸	\$ 861
	SUBTOTAL	\$ 74,131
3	Landfill Gas Monitoring	
	Labor Costs (27 CCR 20921 Monitoring and Reporting) ⁹	\$ 4,200
	Equipment (Methane Meter)	\$ 500
	Probe Replacement ⁷	\$ 680
	Probe Decommissioning ⁸	\$ 205
	SUBTOTAL	\$ 5,585
4	Leachate Management	
	Hauling and Disposal of Leachate ³	\$ 53,550
	SUBTOTAL	\$ 53,550
5	Permitting	
	Permit Fees ⁴	\$ 12,729
	SUBTOTAL	\$ 12,729
	TOTAL ANNUAL COSTS	\$ 168,961

Notes:

1. Where applicable, annual costs for landfill maintenance are estimated based on actual annual costs and labor incurred from 2013 to 2014.
2. Dedicated submersible sampling pumps will be replaced at a rate of approximately 2 per year (\$2,000 each)
3. Leachate Disposal Fees based on Actual Average Volume (315,000 gal.) and trucking/disposal (City of Fort Bragg POTW) cost (\$0.17/gal.) for the years 2012, 2013, & 2015
4. Permit Fees include Annual RWQCB WDR (\$9,188), Stormwater (\$1,761), and LEA (\$1,780) fees.
5. Annual sampling costs are based on an outside consultant labor rate of \$100/hour, 4 hours travel time per quarterly event, 4 hours preparation time per quarterly event, 1.5 hours per sample (83 total per year).
6. Annual reporting costs are based on 2017 solicitation results from outside consultant.
7. Replacement costs spread over 30 years include drill-out and replacement of every well/piezimeter (21 total) and probe (5 total) in existing location to average 20' depth, and all associated labor, materials and equipment.
8. Decommissioning costs spread over 30 years include pressure grouting of every well/piezimeter (21 total) and probe (5 total) per Mendocino County Standards, and all associated labor, materials and equipment.
9. Annual labor costs are based on an outside consultant labor rate of \$100/hour, 4 hours travel time per quarterly event, 4 hours preparation and reporting time per quarterly event, 0.5 hours per sample (20 total per year).

TABLE 2
Groundwater Monitoring Well Construction Data
Caspar Refuse Disposal Site

Monitoring Well	Top of Casing Elevation	Depth of Well (ft)	Diameter of Well Casing
78-1	393.48	29	6" PVC
78-2	392.4	25	6" PVC
78-3	392.9	25	6" PVC
87-1	416.3	25	4" PVC
87-2	397	20	4" PVC
87-3	391.1	14.5	4" PVC
87-4	387.2	19.5	4" PVC
91-1	388.6	57	4" PVC
91-2	381.3	12	4" PVC
91-3	416.06	15.09	4" PVC
91-4	371.9	14.44	4" PVC
91-5	365.5	18.96	2" PVC
91-6	362.79	19.91	2" PVC
91-7	374	18.29	2" PVC
92-1	389.41	12	4" PVC
92-2	358.19	9	4" PVC
94-1	395.71	20	2" PVC
94-2	393.36	20	2" PVC
94-3	392.61	20	2" PVC

**Table 3
Analytical Parameters and Monitoring Frequencies
Caspar Refuse Disposal Site**

Media	Monitoring Frequency (Sampling Events Per Year)					No. of Tests Per Year					Total ³	Test Cost	Annual Cost
	Groundwater	Surface Water	Stormwater	Residential Well	Leachate	Groundwater	Surface Water	Stormwater	Residential Well	Leachate			
Sample Frequency/Per Year	4	1	4	4	1	-	-	-	-	-			
No. Of Sample Locations	19	2	2	6	1	-	-	-	-	-			
pH (EPA 150.1)	X	X	X	X	X	42	2	8	18	1	83	\$ 5	\$ 415
Conductance (EPA 120.1)	X	X	-	X	X	42	2	-	18	1	75	\$ 10	\$ 750
Oil and Grease (EPA 1664A)	-	X	X	-	X	-	2	8	-	1	11	\$ 150	\$ 1,650
Volatile Organic Compounds (EPA 8260)	X	X	-	X	X	46	2	-	18	1	79	\$ 100	\$ 7,900
TDS (EPA 160.1)	-	X	-	X	X	-	2	-	18	1	21	\$ 15	\$ 315
TSS (SM2540D)	-	X	X	-	-	-	2	8	-	-	10	\$ 15	\$ 150
Chloride (EPA 300.0)	-	X	-	X	X	-	2	-	18	1	21	\$ 12	\$ 252
Alkalinity as CaCo3 (SM2320B)	X	-	-	X	X	42	-	-	18	1	73	\$ 25	\$ 1,825
Metals ¹ (EPA 6010,7421,7470,7060,200.7) - Dissolved	X (Mn Only)	X	X (Fe Only)	X	X	42	2	8	18	1	83	\$ 200	\$ 16,600
Pesticides & PCBs ² (EPA 608)	-	-	-	-	-	-	-	-	-	-	0	\$ 95	\$ -
Chemical Oxygen Demand (SM5220D)	-	X	-	X	X	-	2	-	18	1	21	\$ 15	\$ 315
Fluoride, Sulfate, Nitrate (EPA 300)	-	-	-	X	X	-	-	-	18	1	19	\$ 48	\$ 912
Magnesium (EPA 200.7) Dissolved	-	-	-	-	X	-	-	-	-	1	1	\$ 25	\$ 25
Sodium (EPA 200.7) Dissolved	-	-	-	-	X	-	-	-	-	1	1	\$ 25	\$ 25
Potassium (EPA 200.7) Dissolved	-	-	-	-	X	-	-	-	-	1	1	\$ 25	\$ 25
Hardness (SM2320B)	-	-	-	X	X	-	-	-	18	1	19	\$ 15	\$ 285
Semi-Volatile Organic Compound (EPA 8270C)	-	-	-	-	-	-	-	-	-	-	0	\$ 250	\$ -
Chlorinated Herbicides (EPA 8151A)	-	-	-	-	-	-	-	-	-	-	0	\$ 225	\$ -
Total:											\$	\$	31,444

Notes:

1. Aluminum, Antimony, Arsenic, Barium, Beryllium, Baron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Titanium, Tin, Vanadium, & Zinc

2 PCBs: polychlorinated biphenyls

3. Total Test Per Year Includes: No. of test per year + 8 GW trip Blanks (If Applicable) + 4 GW Duplicates (If Applicable)

APPENDIX A
REGULATORY DOCUMENTS (PERMITS)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
NORTH COAST REGION

ORDER NO. 93-83

GENERAL WASTE DISCHARGE REQUIREMENTS

AMENDING WASTE DISCHARGE REQUIREMENTS

FOR

MUNICIPAL SOLID WASTE LANDFILLS

AND

IMPLEMENTING PROVISIONS OF FEDERAL
MUNICIPAL SOLID WASTE LANDFILL REGULATIONS

The California Regional Water Quality Control Board, North Coast Region, (hereinafter the Regional Water Board) finds that:

1. The federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, authorized development of nationwide standards for disposal of municipal solid waste.
2. On October 9, 1991, the United States Environmental Protection Agency (USEPA) promulgated regulations, 40 CFR Parts 257 and Part 258, that apply to dischargers who own or operate landfills receiving municipal solid waste. The federal regulations require each state to implement the federal regulations or an equivalent program. States with approved programs may approve engineered alternatives to certain prescriptive standards contained in the federal regulations.
3. On June 17, 1993, the State Water Resources Control Board adopted Resolution No. 93-62, entitled Policy for Regulation of Discharges of Municipal Solid Waste (Policy), as State Policy for Water Quality Control under authority of Section 13140 of the California Water Code. The Policy directs each Regional Water Quality Control Board to revise the waste discharge requirements of each municipal solid waste landfill to comply with 40 CFR Parts 257 and Parts 258.
4. On June 29, 1993, the U.S. Environmental Protection Agency tentatively approved California's modified solid waste landfill regulations.
5. The Regional Water Board proposes to comply with State Water Resources Control Board Resolution No. 93-62 through the adoption of a single order amending the waste discharge requirements of municipal solid waste landfills within the North Coast Region.
6. Adoption of the general amendment is categorically exempt from the provisions of the California Environmental Quality Act (CEQA), Division 13, commencing with Section 21000 of the Public Resources Code because it is an action by a regulatory agency for the protection of natural resources, within the meaning of Section 15307 of the Guidelines for Implementation of California Environmental Quality Act in Title 14 of the California Code of Regulations.

7. The Board has notified the dischargers and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharges and has provided them with an opportunity to submit their written comments and recommendations.
8. The Regional Water Board, in a public hearing, heard and considered all comments pertaining to adoption of this order.
9. The USEPA has announced its intention to set back several of the compliance dates contained in this Order for certain landfills, but the revised compliance dates have not been established and approved. The Regional Board's Executive Officer may adjust the compliance dates adopted by the USEPA, so long as the landfill involved qualifies for such revised dates under the revised federal MSW regulations.

THEREFORE, IT IS HEREBY ORDERED that Order No. 93-83 amends the waste discharge requirements of the dischargers listed in Section 1. Each discharger shall comply with the provisions of this Order in addition to provisions of existing waste discharge requirements, provided that provisions of this Order supercede any conflicting provision in the waste discharge requirements.

SECTION 1
General Applicability

- (a) This Order is applicable to all existing and lateral expansions at municipal solid waste (MSW) landfills. All MSW landfills shall implement the provisions of Chapter 15, Division 3, Title 23, California Code of Regulations (CCR) and Federal regulations in 40 CFR Part 257 and 258.
- (b) This Order applies only to MSW landfills that receive waste after October 9, 1991.
- (c) MSW landfills receiving waste after October 9, 1991 that halt waste acceptance before October 9, 1993 are exempt from this Order with the exception of the final cover requirements presented in 40 CFR 258.60(a) provided that final cover, meeting the requirements of Article 8, Chapter 15 and 40 CFR 258.60(a), is installed within six months of the last receipt of waste.
- (d) Landfills meeting the requirements of Sections 1(b) and 1(c) above are subject to all requirements of Chapter 15, Division 3, Title 23, CCR.
- (e) Dischargers shall achieve compliance with the groundwater monitoring and corrective action portions of Chapter 15 and 40 CFR Part 258 in accordance with the schedule presented in Section 10 of this Order.
- (f) The discharger shall submit financial assurance documents for closure, post closure and corrective action by April 9, 1994.
- (g) This Order amends the waste discharge requirements for the following dischargers.

<u>Landfill</u>	<u>Discharger</u>	<u>Order No.</u>
Willits Solid Waste Disposal Site Class III Waste Management Unit	City of Willits and County of Mendocino	92-107
Laytonville Solid Waste Disposal Site	County of Mendocino	75-50
Caspar Solid Waste Disposal Site	County of Mendocino and City of Fort Bragg	78-125

Cummings Road Solid Waste Disposal Site	City Garbage Company of Eureka, Inc.	93-46
South Coast Solid Waste Disposal Site	County of Mendocino	77-23
Weaverville Solid Waste Disposal Site	County of Trinity	80-193
City of Ukiah Class II-2 Solid Waste Disposal Site	City of Ukiah	75-43
Happy Camp Landfill	County of Siskiyou	77-10
Lava Beds National Monument Solid Waste Disposal Site	U.S. Department of the Interior, National Park Service	79-76
Tennant Solid Waste Disposal Site	County of Siskiyou	80-46
Hotelling Gulch Solid Waste Disposal Site	County of Siskiyou	82-103
Rogers Creek Solid Waste Disposal Site	County of Siskiyou	82-121
Sheepy Ridge Solid Waste Disposal Site, Class III Waste Management Unit	City of Tulelake	89-74
City of Weed Solid Waste Disposal Site, Class III Waste Management Unit	City of Weed	89-70
City of Yreka Solid Waste Disposal Site, Class III Waste Management Unit	City of Yreka	89-68
Class II-2 Annapolis Solid Waste Disposal Site	County of Sonoma	78-64
Central Disposal Site, Class III Waste Management Unit	County of Sonoma	89-8
Crescent City Solid Waste Disposal Site, Class III Waste Management Unit	County of Del Norte	89-100 89-83

SECTION 2
INTERIM CLASSIFICATION

This section applies to all MSW landfills listed in Subsection 1 that, as of the effective date of this Order, have not been reclassified under 23 CCR §§2510(d,e), 2530(b), and 2591(c).

- (a) MSW landfills subject to this section are hereby granted interim status as Class III landfills under Chapter 15, as of the effective date of this Order, unless and until the landfill is reclassified in accordance with that chapter.
- (b) Dischargers owning or operating an MSW landfill subject to this section shall submit a revised report of waste discharge by October 9, 1994, that is in full compliance with Article 9 of Chapter 15 and that provides all information necessary for the Regional Water Board to reclassify the landfill pursuant to 23 CCR §§2510(d,e) and 2591(c).

SECTION 3
Definitions

- (a) **Affected Persons** All individuals who either own or occupy land outside the boundaries of the parcel upon which the landfill is located that has been or may be affected by the release of leachate or waste constituents, in the liquid or gas phase, from a MSW landfill.
- (b) **Composite Liner** A liner that consists of two or more components which include a synthetic liner in direct and uniform contact with an underlying layer of low permeability soil.
- (c) **Constituents of Concern** Are those constituents which are likely to be in the waste in the MSW landfill including transformation and breakdown products.
- (d) **Existing Footprint** The areal projection portion of land covered by waste as of midnight on the day before the Federal Deadline. The term includes only areas covered by waste that was discharged in a manner consistent either with past good management practices or permitted operations.
- (e) **Federal Deadline** The date listed in 4 CFR Part 258 when the majority of the federal MSW regulations become effective. The current date is October 9, 1993 unless otherwise modified.
- (f) **Lateral Expansion** Any horizontal expansion beyond the existing footprint, as defined in subsection (d) above.

- (g) MSW Landfill For the purpose of this Order, means a Class II or Class III landfill that has accepted or accepts municipal solid waste or solid waste by-products such as ash.
- (h) Unstable area A location that is susceptible to natural or human-induced events capable of impairing the integrity of some or all of the landfill's structural components.

SECTION 4
Liner Requirements

(a) Define Existing Footprint

All dischargers operating after the Federal Deadline, shall document the existing footprint of the waste as of the Federal Deadline using photographs and topographic maps. Documentation shall be submitted to the Regional Water Board by January 15, 1994.

(b) Discharge Prohibition

As of the Federal Deadline, except as noted in subsection 3(c) below, discharge of municipal solid waste to areas that have not received waste is prohibited unless the disposal area is equipped with a composite liner meeting the following requirements:

- i. The uppermost liner component is a synthetic liner at least 40 mils thick (60 mils for high density polyethylene) installed in direct contact with the underlying materials; and
- ii. Has a lower liner component consisting of compacted soil at least two feet thick having a hydraulic conductivity no more than 1×10^{-7} cm/sec.

Alternative designs may be approved by the Executive Officer provided the design satisfies the criteria for an engineered alternative as defined by Chapter 15, Section 2510(b). The engineered alternative shall equal or exceed the performance of the above described composite liner system.

(c) Exemption from Prescriptive Standards

1. Liners Constructed prior to the Federal Deadline

Disposal areas constructed prior to the Federal Deadline which have not received waste as of the Federal Deadline must be retrofitted as follows:

- i. A liner system consisting of a composite liner having its uppermost liner at least 40 mil thick (or 60 mil for high density polyethylene) installed in direct and uniform contact with the underlying materials.

2. Steep Sideslopes

Liner systems installed on those portions of a MSW landfill where sideslopes are too steep to permit construction of a stable composite liner meeting the criteria in Subsection 3(b) above shall include an alternative liner design that meets the performance criteria of 40 CFR 258.40(c) and is either:

- i. A composite liner consisting of a 40 mil thick synthetic upper layer (60 mil thick for high density polyethylene); or
- ii. Is not a composite liner, but includes a synthetic liner at least 60 mils thick (80 mils for high density polyethylene).

(d) Leachate Collection and Removal System

All liner systems shall include a leachate collection and removal system which conveys leachate to a collection point(s). Leachate conveyance on unlined or clay-lined areas is prohibited.

SECTION 5
Liquids Acceptance

(a) General Prohibition

On the Federal Deadline, the discharge of leachate or landfill gas condensate to a MSW landfill is prohibited unless:

1. The portion of the landfill to which leachate is being discharged is equipped with a composite liner meeting the requirements of Section 4(b) of this Order; and
2. The leachate or gas condensate is being returned to the landfill that produced it.

SECTION 6
Siting Criteria

(a) 100-year floodplains

All existing MSW landfills and lateral expansions located in 100-year floodplains must demonstrate that the waste management unit will not restrict the flow of the 100 year flood, reduce the temporary water storage capacity of the floodplain or result in inundation or washout of solid waste. A report documenting compliance with this provision is due by January 15, 1994.

Existing MSW landfills that cannot make this demonstration must close by October 9, 1996. The closure deadline may be extended by 2 years if the discharger

demonstrates to the Regional Water Board that there is no available alternative disposal capacity and no immediate threat to human health and the environment.

(b) Wetlands

Discharge of municipal solid waste to a wetland, as defined in 40 CFR 232.2(r), is prohibited unless the discharger completes all demonstrations required under 40 CFR 258.12(a).

(c) Fault Areas

Lateral expansions shall not be located within 200 feet of a Holocene fault. The Regional Water Board may prescribe an alternative setback less than 200 feet if the discharger demonstrates the integrity of all containment structures and that the alternative will be protective of human health and the environment.

(d) Unstable Areas

Existing MSW landfills and lateral expansions located in unstable areas must demonstrate the integrity of all containment structures. The discharger must consider factors presented in 40 CFR 258.15. A report documenting compliance with this provision is due by January 15, 1994.

If the discharger cannot demonstrate the integrity of the MSW landfill, affected portions of the landfill must close by October 9, 1996. The deadline may be extended up to two years by the Regional Water Board if the discharger demonstrates that there is no available alternative disposal capacity and there is no immediate threat to human health and the environment.

SECTION 7
Closure/Post Closure Plan

(a) Submittal of Closure Plans

1. Recently Closed MSW landfills

Dischargers who operate a MSW landfill that received waste after October 9, 1991 but will cease waste disposal by the Federal Deadline shall submit a report to the Regional Water Board by January 15, 1994 documenting that the landfill's final cover meets the requirements of 40 CFR 258.60(a) or submit modifications to its closure plan to comply with 40 CFR 258.60(a).

2. Operating MSW landfills

Dischargers who operate a MSW landfill that received waste on or after October 9, 1991 and that will not initiate final closure by the Federal Deadline, shall submit a closure and post closure maintenance plan to the Regional Water Board by the Federal Deadline that complies with 40 CFR 258.60 and 258.61 and Article 8, Chapter 15, Title 23, CCR.

3. Post Closure Maintenance

Post Closure maintenance must be conducted for minimum of 30 years.

SECTION 8
Deed Notation

(a) Deed notation

Following closure, the discharger shall provide proof to the Regional Board that the property deed or some other instrument that is normally examined during a title search has been modified, in perpetuity, to notify any potential purchaser of the property that:

- i. The property has been used as a MSW landfill.
- ii. Land use options for the property are restricted in accordance with the approved post closure plan and Waste Discharge Requirements for the landfill.

SECTION 9
Financial Assurance

- (a) Financial assurance documents for closure, post closure and corrective action shall be prepared in accordance with the provisions of 40 CFR Part 258, Subpart G; Title 14, CCR administered by the Integrated Waste Management Board; and Article 5, Chapter 15, Division 3, Title 23, CCR.

Section 10
Implementation Schedule
Self Monitoring Program

(a) General Applicability

Unless the discharger proposes and the Executive Officer approves an alternative monitoring program that meets the requirements of Article 5, Chapter 15 and 40 CFR 258, Subpart E, the discharger shall determine compliance with this Order using the self monitoring program presented in this Order. The discharger shall implement the monitoring program as follows:

- (1) By January 15, 1994 the discharger shall submit a report to the Regional Water Board that determines the distance between the waste management unit and any potential drinking water sources.
- (2) Landfills within one mile of a potential drinking water source shall submit a monitoring systems report by August 9, 1994 and implement the monitoring program presented in this Order or an alternative approved program by October 9, 1994.
- (3) Landfills farther than one mile from a potential drinking water source shall submit a monitoring systems report by August 9, 1995 and implement the monitoring program presented in this order or an alternative approved program by October 9, 1995.

- (b) The Monitoring Parameters and Constituent of Concern(COC) list shall be determined in accordance with Section 11 and 12 of this Order, respectively. For all new COC's, the discharger will immediately develop background concentrations and Concentration Limits in accordance with Section 13 and 14 of this Order.
- (c) The Monitoring Systems Report shall:
- (1) Identify all distinct bodies of groundwater that could be affected in the event of a release from the landfill. This list shall include at least the uppermost aquifer underlying the landfill and any permanent or ephemeral zones of perched water underlying the landfill;
 - (2) Demonstrate that the landfill's existing and proposed monitoring systems satisfy the following requirements;
 - (A) The groundwater monitoring system for each distinct groundwater body identified above must meet the requirements of 40 FR §§258.51(a,c, and d) and 23 CCR §2550.7(b); and
 - (B) Only for dischargers whose waste discharge requirements, as of the effective date of this Order, have not been revised to incorporate the July 1, 1991 revisions to Article 5, Chapter 15:
 - i. An MSW landfill in close proximity to any surface water body must meet the requirements of 23 CCR §2550.7(c); and
 - ii. An MSW landfill overlying an unsaturated zone that can be feasibly monitored must meet the requirements of 23 CCR §2550.7(d).
 - (3) Include a map showing the Monitoring Points, Background Monitoring Points and the Point of Compliance under 23 CCR §2550.5;
 - (4) Estimate the Compliance Period under 23 CCR §2550.6; and
 - (5) Include a list of all Constituents of Concern and Concentration Limits determined in accordance with Sections 12, 13 and 14 of this Order.

SECTION 11
Monitoring Parameters
Self Monitoring Program

- (a) In accordance with the implementation schedule presented in Section 10(a), the discharger shall analyze water samples from each water-bearing medium for the following Monitoring Parameters unless the Regional Water Board approves alternative Monitoring Parameters that meet the requirements of both 23 CCR §§2550.0 et seq. and 40 CFR §§258.54. The discharger shall test the resulting data using either the statistical and non-statistical methods listed in Section 14(f) of this Order or alternative methods the Regional Water Board finds meets the requirements of 23 CCR §§2550.7(e)(6-10) and 40 CFR §258.53:

Volatile Organic Compounds (EPA method 601 and 602)
Metals (EPA 6010: arsenic, selenium and mercury by AA)
Mineral (Calcium, Magnesium, Sodium, Chloride and Sulfate)
General (Alkalinity, pH, Fluoride, Nitrate, Total Dissolved Solids and Chemical
Oxygen Demand)

- (b) For each medium, the Monitoring Points shall be monitored semiannually, once each Winter/Spring and Summer/Fall.

SECTION 12
Constituents of Concern
Self Monitoring Program

(a) Landfills lacking a functioning Leachate Collection System

- (1) For any MSW landfill that does not have both a liner and a leachate collection and removal system (LCRS) that produces leachate, the list of Constituents of Concern (COC) is hereby revised to include all constituents listed in the waste discharge requirements as of the effective date of this Order, in addition to all constituents listed in Appendix II to 40 CFR Part 258. The discharger shall monitor all COCs every five years at a minimum; and
- (2) For each Appendix II constituent that is newly added to the MSW landfill's COC list, the discharger shall establish a reference background value by analyzing at least one sample each quarter from each Background Monitoring Point for a period of at least one year, beginning with the date of this Order. Once this reference set of background data is collected, the discharger shall include it in the Monitoring Systems Report or in the next self-monitoring report.

(b) Landfills having a Leachate Collection System

- (1) For any MSW landfill equipped both with a liner and with a leachate collection and removal system (LCRS) that produces leachate, the Constituent of Concern list is revised to include all waste constituents listed in the waste discharge requirements as of the effective date of this Order, and each constituent listed in Appendix II to 40 CFR Part 258 that is present in leachate samples obtained from the LCRS.
- (2) A compound is defined to be present in leachate if the compound is detected in two consecutive samples from the LCRS. Samples shall be taken in October and April. The April sample is needed only when the October sample identifies new compounds not already included on the COC list.
- (3) Sample results shall be submitted to the Regional Board in July of each year. The report shall identify all Appendix II constituents detected that are not on the landfill's Constituent of Concern list and all constituents which must be added to the landfill's COC list.
- (4) For each Appendix II constituent that is newly added to the MSW landfill's COC list, the discharger shall establish a reference background value by analyzing at least one sample each quarter from each Background Monitoring Point for a period of at least one year following the date the constituent is submitted to the Regional Water Board as a new COC. Once this reference set of background data is collected, the discharger shall include it as a separate, identified item in the next monitoring report submittal.

SECTION 13
Concentration Limits
Self Monitoring Program

The Concentration Limit for any given Constituent of Concern or Monitoring Parameter shall be established as follows, and shall be used as the basis of comparison with data from the Monitoring Points:

- (a) Concentration Limits shall be set at the background value of the constituent based on historical data; or
- (b) The constituent's Concentration Limit may be established during each Monitoring Period using data from all samples collected during that Monitoring Period in the event the discharger establishes the occurrence of seasonal or temporal variations in water quality; or
- (c) The discharger may propose, for Regional Water Board approval, a Concentration Limit greater than background for use during, or after, corrective action.

SECTION 14
Detection Monitoring
Self Monitoring Program

The following detection monitoring program applies to each MSW landfill unless, and until, the Regional Water Board revises the waste discharge requirements for the landfill to include an alternative detection monitoring program that complies with both the federal MSW regulations and with the most recent revisions to Article 5 of Chapter 15.

(a) Sampling and Analytical Methods

Sample collection, storage, and analysis shall be performed according to the most recent version of Test Methods for Evaluating Solid Waste (USEPA publication "SW-846"), and in accordance with an approved sampling and analysis plan. Water and waste analysis shall be performed by a laboratory approved for these analyses by the State of California. Specific methods of analysis must be identified. If methods other than USEPA-approved methods or Standard USEPA Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Water Board Executive Officer prior to use. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Water Board. In addition, the discharger is responsible for seeing that the laboratory analysis of all samples meets the following restrictions:

- (1) The methods of analysis and the detection limits used shall be appropriate for the expected concentrations. For detection monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from Background Monitoring Points, the analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects involved;
- (2) Analytical results falling between the MDL and the practical quantitation limit (PQL) shall be reported as "trace", and shall be accompanied both by the (nominal or estimated) MDL and PQL values for that analytical run;

- (3) MDLs and PQLs shall be derived by the laboratory for each analytical procedure, according to State of California's laboratory accreditation procedures. These nominal MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. If the lab suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived nominal MDL/PQL values, the results shall be flagged accordingly, along with an estimate of the detection limit and quantitation limit actually achieved;
- (4) All QA/QC data shall be reported, along with the sample results to which it applies, including the method, equipment, and analytical detection limits, the recovery rates, an explanation for any recovery rate that is less than 80%, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recovery. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged;
- (5) Upon receiving written approval from the Executive Officer, an alternative statistical or non-statistical procedure can be used for determining the significance of analytical results for a constituent that is a common laboratory contaminant during any given Reporting Period in which QA/QC samples show evidence of laboratory contamination for that constituent. Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for reference;
- (6) Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte. When unknown peaks are encountered, second column or second method confirmation procedures shall be performed to attempt to identify and more accurately quantify the unknown analyte. The MDL and PQL shall be determined or estimated for each peak.

(b) Required Monitoring Reports

- (1) All Monitoring Points assigned to detection monitoring shall be monitored once each Winter/Spring and Summer/Fall (Winter/Spring and Summer/Fall Reporting Periods end on March 31 and September 30, respectively).
- (2) Annual Report

The discharger shall submit an annual report to the Regional Water Board in January covering the previous monitoring year. This report may be combined with the semiannual monitoring report. The report shall contain the following at a minimum:

- (A) For each Monitoring Point, laboratory data will be submitted in graphical format for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents over time at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent, the scale for background plots shall be the same as that used to plot downgradient data. On the basis of any aberrations noted in the plotted data, the Executive Officer may direct

the discharger to carry out a preliminary investigation [23 CCR §2510(d)(2)], the results of which will determine whether or not a release is indicated;

- (B) All monitoring data obtained during the previous two six-month Reporting Periods shall be presented in tabular form as well as on diskettes either in MS-DOS/ASCII format or in another file format acceptable to the Regional Water Board's Executive Officer;
- (C) A comprehensive discussion of the compliance record, and any corrective actions taken or planned which may be needed to bring the discharger into full compliance with the landfill's waste discharge requirements;
- (D) A map showing the area, if any, in which filling has been completed during the previous calendar year;
- (E) A written summary of monitoring results and monitoring system(s), indicating any changes made or observed since the previous annual report;
- (F) For MSW Landfills having leachate monitoring/control facilities, an evaluation of their effectiveness, pursuant to 23 CCR §§2543(b,c, & d).

(3) Routine Constituent of Concern Monitoring

In the absence of a release being indicated, the discharger shall monitor all Constituents of Concern and submit a report as follows:

- (A) The discharger shall sample all Monitoring Points for all COCs every fifth year, beginning with the Spring of 1996. Subsequent COC monitoring efforts being carried out every fifth year thereafter, alternating between the Fall and Spring monitoring periods. The COC Report may be combined with any Monitoring Report;
- (B) The discharger shall monitor for all Constituents of Concern provided that such monitoring need only encompass those Constituents of Concern that do not also serve as Monitoring Parameters.

(4) Minimum Content of Monitoring Reports

All reports shall be submitted by January 15 and July 15. The reports shall be comprised of at least the following, in addition to the specific contents listed above.

- (A) A letter summarizing the essential points in the report. This letter shall include a discussion of any violations found since the last such report was submitted, and shall describe actions taken or planned to correct those violations. If the discharger has previously submitted a detailed time schedule for correcting said violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. Each monitoring report and the transmittal letter shall be signed by a principal executive officer at the level of vice president or above, or by his/her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the

discharge originates. The transmittal letter shall contain a statement by this official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct;

(B) For Detection Monitoring and COC Reports only:

1. For each monitored groundwater body, a description and graphical presentation of the velocity and direction of groundwater flow under/around the landfill, based upon water level elevations taken during the collection of the water quality data submitted in the report; and
2. For each monitoring well, a description of the method and time of water level measurement and a description of the method of purging used both before sampling and after sampling to remove the water that was in the well bore while the sample was being taken; and
3. For each Monitoring Point sampled; a description of the type of pump or other device used and its vertical placement for sampling; a detailed description of the sampling procedure i.e., number and description of the samples, field blanks, travel blanks, and duplicate samples taken, the type of containers and preservatives used; the date and time of sampling; the name and qualifications of the person actually taking the samples, and any other observations;

(C) A map (or copy of an aerial photograph) showing the locations of observation stations, Monitoring Points, and Background Monitoring Points;

(D) For Detection Monitoring and COC Reports only, the laboratory results of all analyses;

(E) A statement as to the condition and performance of any leachate monitoring and control facilities, and of the runoff/run-on control facilities;

(F) The quantity and types of wastes discharged and the locations in the landfill where waste has been placed since submittal of the last such report.

(c) Contingency Responses

(1) Leachate Seeps

The discharger shall immediately report by telephone concerning the discovery any previously unreported seepage from the disposal area. A written report shall be filed with the Board within seven days, containing at least the following information:

- (A) A map showing the location(s) of seepage;
- (B) An estimate of the flow rate;
- (C) A description of the nature of the discharge (e.g., all pertinent observations and analyses); and

(D) Corrective measures approved (or proposed for consideration) by the Regional Water Board Executive Officer.

(2) Response to Initial Indication of Release

Should the initial statistical or non-statistical comparison indicate, for any Constituent of Concern or Monitoring Parameter, that a release is tentatively identified, the discharger shall: immediately notify the Regional Water Board staff verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved; shall provide written notification by certified mail within seven days of such determination [23 CCR §2550.8(j)(1)]; and shall carry out a discrete retest with 30 days in accordance with subsection (f)(3) of this section. If the retest confirms the existence of a release, the discharger shall carry out the requirements of subsection (c)(4) of this section. In any case, the discharger shall inform the Regional Water Board of the outcome of the retest as soon as the results are available, following up with written results submitted by certified mail within seven days of completing the retest.

(3) Physical Evidence of a Release

If either the discharger or the Regional Water Board Executive Officer determines that there is significant physical evidence of a release [23 CCR §2550.1(3)], the discharger shall:

- (A) Immediately notify the Regional Water Board by certified mail (or acknowledge the Regional Water Board's determination);
- (B) Carry out the requirements of subsection (c)(4) of this section for all potentially-affected monitored media; and
- (C) Carry out any additional investigations stipulated in writing by the Regional Water Board Executive Officer for the purpose of identifying the cause of the indication.

(4) Response to a Confirmed Release

If the discharger concludes that a release has been discovered:

- (A) If this conclusion is not based upon monitoring for all Constituents of Concern, then the discharger shall, sample for all Constituents of Concern at all Monitoring Points and submit them for laboratory analysis within thirty days of discovering the release. Within seven days of receiving the laboratory analytical results, the discharger shall notify the Regional Water Board, by certified mail, of the concentration of all Constituents of Concern at each Monitoring Point; this notification shall include a synopsis showing those constituents that exhibit an unusually high concentration. Because the data from this scan is not to be statistically tested against background, only a single datum is required for each Constituent of Concern at each Monitoring Point [23 CCR §2550.8(k)(1)];

(B) The discharger shall, within 90 days of confirming a release, submit a Revised Report of Waste Discharge proposing an Evaluation Monitoring Program that:

1. Is intended to define the nature and extent of the release and meets the requirements of 23 CCR §2550.8(k)(5) and §2550.9; and
2. Satisfies the requirements of 40 CFR §258.55(g)(1)(ii) by committing to install at least one monitoring well at the facility boundary directly downgradient of the center of the release, immediately after delineating the nature and extent of the release under 23 CCR §2550.9(b);

(C) 90 days after the Regional Board directs the discharger to implement the Evaluation Monitoring Program, the discharger will submit a report delineating the vertical and horizontal limits of the release for all Constituents of Concern. This delineation effort shall be carried out in addition to any ongoing monitoring program (e.g., detection monitoring program); nevertheless, the discharger's delineation effort shall encompass all relevant monitoring data.

(D) The discharger shall, within 180 days of confirming a release, submit a preliminary engineering feasibility study meeting the requirements of 23 CCR §2550.8(k)(6).

(5) Release beyond the Facility Boundary

Any time a release beyond the facility boundary occurs, the discharger shall notify all persons who either own or reside upon the land that directly overlies any part of the plume.

(A) Initial notification to affected persons shall be accomplished within 14 days of making this conclusion and shall include a description of the discharger's current knowledge of the nature and extent of the release.

(B) Subsequent to initial notification, the discharger shall provide updates to all affected persons, including any persons newly affected by a change in the boundary of the release, within 14 days of concluding there has been any material change in the nature or extent of the release.

(C) Each time the discharger sends a notification to affected persons, the discharger shall provide the Regional Water Board, within seven days of sending such notification, with both a copy of the notification and a current mailing list of affected persons.

(6) Response to VOC Detection in Background

Except for VOC's previously validated as not originating from the landfill, any time the laboratory analysis of a sample from a Background Monitoring Point, shows either (a) two or more VOCs at or above their respective MDL; or (b) one VOC at or above its respective PQL, then the discharger shall immediately notify the Regional Water Board by phone that possible background contamination has occurred, shall follow up with written notification by certified mail within seven days, and shall obtain two new independent VOC samples from that Background Monitoring Point and send them

for laboratory analysis of all detectable VOCs within thirty days. If either or both of these retest samples validates the presence of VOC(s) at that Background Monitoring Point, the discharger shall:

1. Immediately notify the Regional Water Board that VOC(s) are present at Background Monitoring Point(s), and follow-up with written notification submitted by certified mail within seven days of validation; and
 2. Within 180 days of validation, submit a report, acceptable to the Executive Officer, which examines the possibility that the detected VOC(s) originated from the landfill (e.g., using concentration gradient analyses), and proposes appropriate changes to the monitoring program.
- (B) If, after reviewing the report, the Executive Officer determines that the VOC(s) originated from a source other than the landfill, the Executive Officer will make appropriate changes to the monitoring program.
- (C) If, after reviewing the report, the Executive Officer determines that the VOC(s) most likely originated from the landfill, the discharger shall conclude that a release has been detected and shall immediately investigate the release in accordance with subsection (c)(4) this section.
- (d) Water Sampling and Analysis for Detection Monitoring
- (1) For any given monitored medium, samples shall be taken from all Monitoring Points during the latter third of the Reporting Period within a span not exceeding 30 days, and shall be taken in a manner that insures sample independence to the greatest extent feasible [23 CCR §2550.7(e)(12)(B)]. Sample procurement shall be carried out as late in the Reporting Period as feasible, considering the time needed to analyze the samples, analyze the resulting data, and submit the monitoring report.
 - (2) Groundwater sampling shall also include an accurate measurement of the groundwater surface elevation and field parameters (temperature, electrical conductivity, turbidity) [23 CCR §2550.7(e)(13)]. Groundwater elevations shall be taken prior to purging the well.
 - (3) Statistical or non-statistical analysis shall be carried out as soon as the monitoring data is available.
- (e) For each monitored groundwater body, the discharger shall determine the groundwater flow rate and direction at least quarterly, including the times of expected highest and lowest elevations of the water level for the respective groundwater body. This information shall be included in the semiannual monitoring reports.
- (f) Statistical and Non Statistical Methods

The following data analysis methods shall be used at MSW landfills unless and until the discharger proposes, and the Regional Water Board revises the waste discharge requirements to include, data analysis methods that comply with the July 1, 1991 revision of Article 5 of Chapter 15. Nevertheless, dischargers who own or operate MSW landfills having waste discharge requirements that have been revised to comply with revised Article 5 shall use the following non-statistical data analysis methods for constituents that cannot be addressed by statistical means and shall use the

following statistical analysis scheme on those constituents for which the Regional Water Board has not yet approved a statistical method.

The discharger subject to this section shall use the most appropriate of the following methods to compare the downgradient concentration of each monitored constituent (or parameter) with its respective background concentration to determine if there has been a release from the landfill. For any given data set, the discharger shall first decide if statistical analysis is possible, by reference to the relative frequency with which the constituent is detected in background samples. For a constituent that qualifies for statistical analysis, the discharger shall proceed sequentially down the list of statistical analysis methods listed below, using the first method for which the data qualifies. Those constituents for which no statistical method is appropriate shall be analyzed by the non-statistical method. If the initial statistical/non-statistical analysis tentatively indicates the detection of a release, the discharger shall implement the retest procedure under subsection (f)(3) of this section.

(1) Statistical Methods.

The discharger shall use one of the following statistical methods to analyze Constituents of Concern or Monitoring Parameters which exhibit concentrations which equal or exceed their respective MDL in at least ten percent of the background samples taken during that Reporting Period. Except for pH, which uses a two-tailed approach, the statistical analysis for all constituents and parameters shall be one-tailed (testing only for statistically significant increase relative to background):

- (A) One-Way Parametric Analysis of Variance (ANOVA), followed by multiple comparisons [§2550.7(e)(8)(A)]. This method requires at least four independent samples from each Monitoring Point and Background Monitoring Point during each sampling episode. It shall be used when the background data for the parameter or constituent, obtained during a given sampling period, has not more than 15% of the data below the PQL. Prior to analysis, replace all "trace" determinations with a value halfway between the PQL and the MDL values reported for that sample run, and replace all "non-detect" determinations with a value equal to half the MDL value reported for that sample run. The ANOVA shall be carried out at the 95% confidence level. Following the ANOVA, the data from each downgradient Monitoring Point shall be tested at a 99% confidence level against the pooled background data. If these multiple comparisons cause the Null Hypothesis (i.e., that there is no release) to be rejected at any Monitoring Point, the discharger shall conclude that a release is tentatively indicated for that parameter or constituent and shall immediately implement the retest procedure under subsection (f)(3) of this section;
- (B) One-Way Non-Parametric ANOVA (Kruskal-Wallis Test), followed by multiple comparisons. This method requires at least nine independent samples from each Monitoring Point and Background Monitoring Point; therefore, the discharger shall anticipate the need for taking more than four samples per Monitoring Point, based upon past monitoring results. This method shall be used when the pooled background data for the parameter or constituent, obtained within a given sampling Period, has not more than 50% of the data below the PQL. The ANOVA shall be carried out at the 95% confidence

level. Following the ANOVA, the data from each downgradient Monitoring Point shall be tested at a 99% confidence level against the pooled background data. If these multiple comparisons cause the Null Hypothesis (i.e., that there is no release) to be rejected at any Monitoring Point, the discharger shall conclude that a release is tentatively indicated for that parameter or constituent and shall immediately implement the retest procedure under subsection (f)(3) of this section; or

- (C) Method of Proportions. This method shall be used if the "combined data set" -- the data from a given Monitoring Point in combination with the data from the Background Monitoring Points -- has between 50% and 90% of the data below the MDL for the constituent or parameter in question. This method: (a) requires at least nine downgradient data points per Monitoring Point per Reporting Period; (b) requires at least thirty data points in the combined data set; and, (c) requires that $n * P > 5$ (where n is the number of data points in the combined data set and P is the proportion of the combined set that exceeds the MDL). Therefore, the discharger shall anticipate the number of samples required, based upon past monitoring results. The test shall be carried out at the 99% confidence level. If the analysis results in rejection of the Null Hypothesis (i.e., that there is no release), the discharger shall conclude that a release is tentatively indicated for that constituent or parameter, and shall immediately implement the retest procedure under subsection (f)(3) of this section.
- (2) Non-Statistical Method. The discharger shall use the following non-statistical method for analyzing all constituents which are not amenable to statistical analysis by virtue of having being detected in less than 10% of applicable background samples. A separate variant of this test is used for the VOC_{water} Composite Monitoring Parameter and for qualifying Constituents of Concern. Regardless of the test variant used, the method involves a two-step process: (a) from all constituents to which the test variant applies, compile a list of those constituents which exceed their respective MDL in the downgradient sample from a given Monitoring Point, then (b) evaluate whether the listed constituents meet either of the test variant's two possible triggering conditions. For each Monitoring Point, the list described above shall be compiled based on either: the data from the single sample (for that constituent) taken during that Reporting Period from that Monitoring Point, or (where several independent samples have been analyzed for that constituent at a given Monitoring Point) the data from the sample which contains the largest number of detected constituents. Background shall be represented by the data from all samples taken from the appropriate Background Monitoring Points during that Reporting Period (at least one sample from each Background Monitoring Point). The method shall be implemented as follows:

- (A) Version for the Volatile Organics Composite Monitoring Parameter For Water Samples (VOC_{water})

For any given Monitoring Point, the VOC_{water} Monitoring Parameter is a composite parameter addressing all detectable VOCs, including at least all 47 VOCs listed in Appendix I to 40 CFR Part 258. The discharger shall compile a list of each VOC which exceeds its MDL in the Monitoring Point sample (an unidentified peak must exceed its presumed MDL to be a candidate for the list), and also exceeds its MDL in

less than ten percent of the samples taken during that Reporting Period from that medium's Background Monitoring Points. The discharger shall conclude that a release is tentatively indicated for the VOC_{water} composite Monitoring Parameter if the list either; (a) contains two or more VOCs that equals or exceeds its MDL; or (b) contains one VOC that equals or exceeds its PQL;

(B) Version for Constituents of Concern.

During Constituent of Concern monitoring, the discharger shall compile a list of constituents of concern at each Monitoring Point that equals or exceeds their respective MDL at the Monitoring Point yet do so in less than ten percent of the background samples taken during that Reporting Period. The discharger shall conclude that a release is tentatively indicated if the list either; (a) contains two or more constituents that equals or exceeds its MDL; or (b) contains one constituent which equals or exceeds its PQL.

(3) Discrete Retest Procedure

In the event that the discharger concludes that a release has been tentatively indicated, the discharger shall collect two new suites of samples (for VOC_{water} or for the indicated Constituent[s] of Concern) from the Monitoring Point in question within 30 days of such indication. Resampling of the Background Monitoring Points is optional. As soon as the retest data is available, the discharger shall use the same statistical method as the initial test to separately analyze each of the two suites of retest data for the affected Monitoring Point. For any indicated Monitoring Parameter or Constituent of Concern, if the test results of either (or both) of the retest data suites confirms the original indication, the discharger shall conclude that a release has been discovered and shall carry out the requirements of subsection (c)(4) of this section. All retests shall be carried out only for those Monitoring Point(s) at which a release is tentatively indicated, and only for the Constituent of Concern or Monitoring Parameter which triggered the indication there, as follows:

- (A) If a (parametric or non-parametric) ANOVA method was used in the initial test, the retest shall involve only a repeat of the multiple comparison procedure, carried out separately on each of the two new suites of samples taken from the indicating Monitoring Point;
- (B) If the Method of Proportions statistical test was used, the retest shall consist of a full repeat of the statistical test for the indicated constituent or parameter, carried out separately on each of the two new suites of samples from the indicating Monitoring Point;
- (C) If the non-statistical method was used:
 - 1. Because the VOC_{water} composite Monitoring Parameter is a single parameter which addresses an entire family of constituents likely to be present in any landfill release, the scope of the laboratory analysis for each of the two retest samples shall

include all VOCs detectable in that retest sample. Therefore, a confirming retest for either parameter shall have validated the original indication even if the detected constituents in the confirming retest sample(s) differs from those detected in the sample which initiated the retest;

2. Because all Constituents of Concern that are jointly addressed in the non-statistical test under subsection (f)(2)(B) above, remain as individual Constituents of Concern, the scope of the laboratory analysis for the non-statistical retest of Constituents of Concern shall address only those constituents detected in the sample which initiated the retest.

I, Benjamin D. Kor, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on September 22, 1993.

ORIGINAL SIGNED BY

Benjamin D. Kor
Executive Officer

(order - Final Version)



SEP 9 '93

RECEIVED

SEP 3 - 1993

GOVERNOR PETE WILSON

September 3, 1993

- BK
- ER
- RT
- JH
- SW
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- ALL STAFF
- RK
- LR
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- PG
- JS
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- REPLY
- FILE

JPC
 Cup Board
 WGP
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Mr. John P. Caffrey, Chairman
 State Water Resources Control Board
 901 P Street
 Sacramento, California 95814

Recently, I signed AB 1827 (Sher) to comply with the mandated requirements of the new federal law governing national standards for solid waste management. California was required to comply with the new solid waste standards when Congress reauthorized the Resources Conservation and Recovery Act (RCRA), the primary federal statute governing solid waste.

This is yet another new, unfunded, Federal mandate which will create an additional burden on local government in California, especially already distressed rural counties.

As I have stated repeatedly, I remain firmly opposed to all such unfunded federal mandates. Unfortunately, unless Congress amends RCRA or U.S. EPA amends its regulations, costs for both taxpayers and business will increase. However, the failure to pass AB 1827 would have resulted in federal sanctions which would have an even more onerous burden on both public and private landowners.

AB 1827 accomplishes the changes in California law necessary for the state to obtain final solid waste program approval from the United States Environmental Protection Agency (U.S. EPA). As an approved state, California will be able to utilize both the flexibility in the federal program to aggressively work with local governments to meet their unique circumstances and avoid even more onerous and costly federal sanctions.

New federal regulations, known as Subtitle D under RCRA, require county landfills to adhere to strict new standards beginning October 9, 1993. Subtitle D requires a number of major and costly changes in the way these facilities are designed, operated, and ultimately closed.

In order to assist landfill operators throughout the state in making this transition and dealing with these changes in the most prompt and efficient manner possible, I have directed the state agencies to pursue three immediate courses of action.

Mr. Caffrey
September 3, 1993
Page Two

First, I have directed my Washington office to aggressively pursue waivers with the United States Environmental Protection Agency to grant an extension of time for small landfills to come into compliance with these new requirements.

Second, our state will continue to work with the United States Environmental Protection Agency on ways to work with the United States Environmental Protection Agency on ways to maximize California flexibility under this program. Through the passage of this bill, the statutory provisions are in place to enable California to become one of the first "approved states" under these new Subtitle D regulations. We will aggressively pursue every mechanism to provide local governments with the greatest flexibility possible in order to respond to their unique circumstances. It is important to note that much of the flexibility in the federal program is only available to approved state programs. I have asked the California Integrated Waste Management Board and the State Water Resources Control Board to institute all areas of currently allowed flexibility by the October 9, 1993, deadline.

Third, I have asked the state's Integrated Waste Management Board and the Water Resources Control Board to jointly conduct a series of informational workshops in September for public and private landfill operators, local governments and other interested parties so that they may have full information and assistance in complying with the requirements of the law.

If you have any questions or recommendations regarding the implementation of this regulation, please ask your staff to contact Paul Blais, Special Assistant to the Secretary at the California Environmental Protection Agency at (916) 324-7584

Sincerely,



PETE WILSON

Enclosure

cc: Paul Blais

SUBTITLE D WORKSHOP SCHEDULE

Friday, September 17, 1993

Ventura County

9:00 am - 3:00 pm

Poinsettia Pavillion
Santa Paula Room
3451 Foothill Road
Ventura, California

Monday, September 20, 1993

Alameda County

9:00 am - 3:00 pm

Alameda County Waste Management Authority
Westgate Building
1933 Davis Street, Suite 305
San Leandro, California 94577

Thursday, September 23, 1993

Sacramento County

10:00 am - 5:00 pm

California Intergrated Waste Managment Board
Board Room
8800 Cal Center Drive
Sacramento, California 95826

Monday, September 27, 1993

Orange County

9:00 am - 3:00 pm

Orange County Public Library
Multipurpose Room
1501 East St. Andrews Place Street
Santa Ana, California

Wednesday, September 29, 1993

Fresno County

10:00 am - 3:00 pm

Fresno county Bosard of Supervisors
2281 Tulare Street, Room 301
Hall of Records
Fresno, California 93721-2198

SUBTITLE D WORKSHOP SCHEDULE
Page Two

Thursday, September 30, 1993

Shasta County

1:00 pm - 5:00 pm

Redding City Council chambers
1313 California Street
Redding, California

Monday, October 4, 1993

San Diego County

10:00 am - 3:00 pm

San Diego County Board of Supervisors
North Chambers, Room 310
1600 Pacific Highway
San Diego, California

California Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California, 95403

NOTICE OF PUBLIC HEARING

FOR

CONSIDERATION OF ADOPTION
OF AN ORDER
AMENDING
WASTE DISCHARGE REQUIREMENTS

FOR

MUNICIPAL SOLID WASTE LANDFILLS

Humboldt, Del Norte, Mendocino, Siskiyou, Sonoma, and Trinity Counties

On October 9, 1991, the United States Environmental Protection Agency (USEPA) promulgated regulations pertaining to municipal solid waste landfills. Federal regulations, contained in 40 CFR parts 257 and 258, prescribe minimum standards for siting, operations and closure. Individual States may enact equivalent statewide programs after review and approval by the USEPA.

On June 17, 1993 the State Water Resources Control Board adopted a Policy for Regulation of Discharges of Municipal Solid Waste. The Policy directs the Regional Water Quality Control Boards to amend waste discharge requirements for municipal solid waste landfills to incorporate applicable portions of the federal "Subtitle D" regulations.

The Regional Water Quality Control Board, North Coast Region, proposes to implement the Statewide Policy and applicable provisions of the Federal regulations by adoption of Order No. 93-83, amending the waste discharge requirements of all municipal solid waste landfills in the North Coast Region. This Order will only apply to municipal landfills operating after October 9, 1991.

Although the USEPA has indicated it will consider delaying the implementation of the Federal regulations by six months, such a delay is by no means certain. Also, the delay in implementation will only effect small landfills. Unless modified, the effective date of implementation of the Federal Regulations and proposed Order No. 93-83 is October 9, 1993.

A public meeting to consider comments and objections to the proposed Order will be held on September 22, 1993 at 9:00 a.m. or as soon thereafter as practicable, or as announced in the Regional Board's agenda to be mailed on September 8, 1993. The meeting will be held at Siskiyou County Historical Society, 910 South Main Street, Yreka, California.

All interested persons should submit to the Regional Board office at 5550 Skylane Boulevard, Suite A, Santa Rosa, CA 95403, written copies of all technical reports, testimony and other evidentiary material concerning this issue by 5:00 p.m. of September 3, 1993. This written material will be submitted to the Regional Board Members and all interested persons along with the full agenda materials.

Persons submitting written testimony and documentary evidence should be present at the hearing and available for cross examination. Testimony at the above scheduled hearing should be limited to a summary of the written evidence and testimony, provided however, that upon a proper showing that evidence is available which was not available at the time the written testimony was submitted, the Board may allow further submission of oral or written testimony. If this showing is not made, the Board may refuse to accept such further oral or written testimony.

The tentative Order, related documents and comments received are on file and may be inspected or copied at the Regional Board office on Mondays 1:30 to 4:30 p.m., Tuesday through Thursday 8:30 to 11:30 a.m. and 1:30 to 4:30 p.m., and Fridays 8:30 to 11:30 a.m.

Benjamin D. Kor
Executive Officer

August 11, 1993

California Regional Water Quality Control Board
North Coast Region

ORDER NO. 91-125

REQUIRING THE COUNTY OF MENDOCINO AND THE CITY
OF FORT BRAGG TO CEASE AND DESIST FROM
DISCHARGING AND THREATENING TO DISCHARGE
WASTES IN VIOLATION OF WASTE DISCHARGE
REQUIREMENTS PRESCRIBED BY THE NORTH COAST
REGIONAL WATER QUALITY CONTROL BOARD

Mendocino County

The California Regional Water Quality Control Board, North Coast Region,
(hereinafter the Regional Board), finds that:

1. The Regional Board adopted Waste Discharge Requirements Order No. 78-125 for the County of Mendocino and the City of Fort Bragg (hereinafter the discharger), Caspar Solid Waste Disposal Site on July 27, 1978. The 60 acre site is held under joint ownership of undivided interest by the County of Mendocino and the City of Fort Bragg. Operation of the site is administered by the County of Mendocino under a Joint Powers Agreement with the City of Fort Bragg. Order No. 78-125 rescinded and updated previous Waste Discharge Requirements prescribed by the Regional Board. The County has operated the Caspar Solid Waste Disposal Site as an above ground waste pile since 1977. Prior to the period of operation by the County of Mendocino, the site was operated by a private company which disposed of solid waste in trenches excavated beneath the existing landfill.
2. The discharge of waste is taking place or threatening to take place in violation of the following portions of Waste Discharge Requirements Order No. 78-125:

"A. Discharge Specifications

1. The treatment or disposal of waste shall not cause a pollution or nuisance as defined in Section 13050 of the California Water Code.
2. No Group 2 waste shall be deposited in any area excavated below an elevation that does not at all times provide a minimum vertical separation of at least five feet between the waste and groundwater."
3. Groundwater quality data collected from monitoring wells at the site indicate that the discharges have created a condition of pollution or nuisance.
4. Review of site conditions pursuant to Title 23, California Code of Regulations, Division 3, Chapter 15, indicates that minimum separation requirements between waste and high seasonal groundwater elevation are not in conformance with Chapter 15 siting criteria (i.e., at least five feet) and are not adequate to prevent groundwater quality degradation in the vicinity of the site.

5. In order to comply with the Waste Discharge Requirements, the discharger must develop and implement a corrective action program, cease discharging waste at the site, close the site, and develop alternative means for solid waste disposal.
6. This action by the Regional Board is an enforcement action necessary to protect the environment and, pursuant to Section 15321 of the State CEQA Guidelines, is categorically exempt from provisions of the California Environmental Quality Act.
7. On August 22, 1991, after due notice to the discharger and all other affected persons, the Regional Board conducted a public hearing at which all relevant testimony was heard.

THEREFORE, IT IS HEREBY ORDERED that the discharger shall cease and desist from violating or threatening to violate Waste Discharge Requirements Order No. 78-125 in accordance with the following time schedule:

<u>Task</u>	<u>Due Date</u>
1. Submit an Organization Plan for management of solid waste collection and disposal.	October 1, 1991
2. Establish a financial mechanism to fund solid waste management program.	February 1, 1992
3. Submit a Corrective Action Plan to abate the effects of groundwater degradation.	March 1, 1992
4. Prepare Master Development Plan describing cell construction specifications and sequencing for the duration of waste disposal prior to site closure.	March 1, 1992
5. Submit a Closure and Post Closure Maintenance Plan.	May 1, 1992
6. Develop a preliminary list of candidate waste management alternatives, including disposal sites, recycling facilities, composting operations, and other source reduction measures.	July 1, 1992
7. Complete evaluation of preliminary candidate disposal sites and submit a list of final candidate sites.	December 1, 1992

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|--|------------------|
| 8. Complete detailed hydrologic investigation of final candidate sites and select a recommended alternative. | April 1, 1994 |
| 9. Complete CEQA documents for the new site selection process. | April 1, 1994 |
| 10. Acquire land for the new site. | October 1, 1994 |
| 11. Complete design plans and specifications for the new site. | February 1, 1995 |
| 12. Commence construction of the new site. | July 1, 1995 |
| 13. Commence disposal operations at the new site and discontinue disposal operations at the Caspar site. | July 1, 1996 |

If, in the opinion of the Regional Board, the discharger fails to comply with the provisions of this Order, the Executive Officer is directed to request the Attorney General to take appropriate enforcement actions against the discharger, including injunction and civil monetary remedies.

Certification

I, Benjamin D. Kor, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on August 22, 1991.

Benjamin D. Kor
Executive Officer

(casparcd)



California Regional Water Quality Control Board
North Coast Region

CLEANUP AND ABATEMENT ORDER NO. 91-110

COUNTY OF MENDOCINO
AND
CITY OF FORT BRAGG

CASPAR SOLID WASTE DISPOSAL SITE

Mendocino County

THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, NORTH COAST REGION
(HEREINAFTER THE REGIONAL BOARD), FINDS THAT:

1. The Regional Board adopted Waste Discharge Requirements Order No. 78-125 for the County of Mendocino and the City of Fort Bragg (hereinafter discharger), Caspar Solid Waste Disposal Site on July 27, 1978. The 60 acre site is held under joint ownership of undivided interest by the County of Mendocino and the City of Fort Bragg. Operation of the site is administered by the County of Mendocino under a Joint Powers Agreement with the City of Fort Bragg.
2. Chapter 15, Division 3, Title 23, California Code of Regulations requires that waste discharge requirements be updated to meet land disposal regulations revised in 1984.
3. On January 6, 1989, the Regional Board requested a Report of Waste Discharge for the Caspar Solid Waste Disposal Site (SWDS) to enable the Regional Board to update the waste discharge requirements. A draft Report of Waste Discharge was received by the Regional Board on June 7, 1991. On June 24, 1991, the Regional Board prepared comments on the draft Report of Waste Discharge. Regional Board comments must be resolved before the Report of Waste Discharge is considered complete.
4. The Report of Waste Discharge recommends additional work to complete the hydrogeologic assessment and also recommends corrective measures to control production of leachate at the Caspar SWDS.
5. The Report of Waste Discharge contains information which confirms groundwater contamination at the site related to the landfill operation. The groundwater contaminants include carbon tetrachloride, trans 1,2-dichloroethylene, cis 1,2-dichloroethylene, vinyl chloride, methylene chloride, trichloroethylene, dichlorodifluoromethane, and benzene. The contamination threatens the drinking water supplies of nearby private properties. The groundwater contamination has created a condition of pollution and nuisance.
6. The Report of Waste Discharge confirms that the Caspar Solid Waste Disposal Site does not meet Chapter 15 minimum requirements regarding separation between wastes and high seasonal groundwater.

7. Section 13304 of the Porter-Cologne Water Quality Control Act (California Water Code) states in part that:

"Any person... who has caused or permitted... or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the State and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the Regional Board cleanup such waste or abate the effects thereof or, in the case of threatened pollution or nuisance, take other necessary remedial action."

8. This action by the Regional Board is an enforcement action necessary to protect the environment and, pursuant to Section 15321, Title 14, California Code of Regulations, is categorically exempt from the provisions of the California Environmental Quality Act.

THEREFORE, IT IS HEREBY ORDERED that pursuant to Section 13304 of the Porter-Cologne Water Quality Act, the discharger shall abate the threat of water quality degradation as follows:

1. Submit a response to Regional Board comments on the draft Report of Waste Discharge dated June 21, 1991, by August 1, 1991.
2. Submit a workplan to complete investigation of the extent of contamination by August 1, 1991. The workplan must include:
 - a. The locations and construction specifications for proposed new monitoring wells, locations for soils borings, and locations for piezometers.
 - b. A plan for determining permeabilities and transmissivities of individual soil layers within the marine terrace deposit.
 - c. A time schedule for implementing Tasks 2. a., and b.
3. Submit a workplan with a time schedule for implementing measures to reduce leachate production by September 1, 1991. The workplan must include:
 - a. Plans and specifications for drainage improvements.
 - b. Plans and specifications for liners for subsequent cell construction.
 - c. Plans for regrading slopes to improve runoff.
 - d. Plans and specifications for interim cover improvements to minimize infiltration.
 - e. Location and construction specifications and time schedule for installing leachate extraction wells.

- f. In-depth water balance referred to in the draft Report of Waste Discharge.
4. Submit by August 1, 1991, evidence that the California Environmental Quality Act (CEQA) process has been initiated for expanded site operation. Submittal must include a proposed date for completing an initial study in conformance with CEQA requirements.
5. The discharger shall implement the workplans, according to the approved time schedule within five days of approval of the workplans by the Executive Officer of the Regional Board.
6. If for any reason the discharger is unable to perform any activity or submit any documentation in compliance with the work schedule submitted pursuant to this Order, and approved by the Executive Officer, the discharger may request, in writing, an extension of time as specified. The extension request shall include justification for this delay. An extension may be granted for good cause, in which case the Order will be accordingly revised.

ORIGINAL SIGNED BY

Ordered by _____

Benjamin D. Kor
Executive Officer

June 24, 1991

(caspcao)

California Regional Water Quality Control Board
North Coast Region

Order No. 78-125

WASTE DISCHARGE REQUIREMENTS

for

COUNTY OF MENDOCINO and CITY OF FORT BRAGG
CLASS II-2 CASPER SOLID WASTE DISPOSAL SITE

Mendocino County

The California Regional Water Quality Control Board, North Coast Region, finds that:

1. The Casper Solid Waste Disposal Site is located approximately seven miles southeast of the City of Fort Bragg in the NW 1/4 of Section 17, T17N, R17W, MDB&M, as shown in Attachments "A" and "B" incorporated herein and made a part of this order. The site is within the Doyle Creek drainage basin.
2. The 60 acre site is held under joint ownership of undivided interest by the County of Mendocino and the City of Fort Bragg.
3. The operation of the Casper Solid Waste Disposal Site is administered by the County of Mendocino under a Joint Powers Agreement with the City of Fort Bragg.
4. The County estimates that the site receives approximately 220 cubic yards per day of Group 2 domestic waste from the Mendocino coastal area. The method of operation is to landfill the waste in the eastern portion of the site in an area of approximately 15 acres; see Disposal Area (A) Attachment "B". The estimated life of the site using the present method of operation is approximately 11 years.
5. The disposal site is located on Pleistocene marine terrace deposits that are comprised of clay, silt, sand, and gravel. These deposits are underlain by marine sandstone and shale. The minimum depth to groundwater is approximately five feet within disposal area (A), Attachment "B". The minimum depth to groundwater in the area west of disposal area (A) uniformly decreases in a westerly direction and is approximately one foot deep at a point 700 feet west of area (A). The annual rainfall for the area is approximately 40 inches per year.
6. Disposal area (A), Attachment "B", meets the criteria contained in the California Administrative Code, Title 23, Chapter 3, Subchapter 15, for classification as a Class II-2 disposal site suitable to receive Group 2 and 3 wastes.
7. Beneficial uses of groundwater and surface springs in the vicinity include domestic water supply.
8. Land within 1000 feet of the site is used for the Russian Gulch State Park and for rural residential.

9. The total estimated unused capacity of the site is approximately 300,000 cubic yards.
10. The Board adopted the Water Quality Control Plan for the North Coastal Basin on March 20, 1975.
11. The Regional Board adopted Order No. 76-112, Waste Discharge Requirements for the Class II-2 Casper Solid Waste Disposal Site on August 26, 1976.
12. This order applies to the discharge associated with the operation of an existing solid waste disposal site and involves no expansion in use beyond that previously existing, and is, therefore, exempt as an existing facility from the requirements of the California Environmental Quality Act. The Regional Board finds that this discharge will not cause adverse environmental impacts if conducted in accordance with the limitations and provisions of this order.
13. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge.
14. The Board in a public meeting heard and considered all comments pertaining to the discharge.

THEREFORE, IT IS HEREBY ORDERED that Order No. 76-112, Waste Discharge Requirements for the Class II-2 Casper Solid Waste Disposal Site be rescinded and that the County of Mendocino and the City of Fort Bragg shall comply with the following:

A. DISCHARGE SPECIFICATIONS:

1. The treatment or disposal of waste shall not cause a pollution or nuisance as defined in Section 13050 of the California Water Code.
2. No waste materials shall be deposited outside of the disposal area designated area (A) shown on Attachment "B".
3. No Group 2 waste shall be deposited in any area excavated below an elevation that does not at all times provide a minimum vertical separation of at least five feet between the waste and groundwater.
4. Group 1 wastes shall not be deposited at this site.
5. Group 2 wastes shall not be placed in ponded water from any source whatsoever.
6. Surface drainage from tributary areas and internal site drainage from surface or subsurface sources shall not contact or percolate through Group 2 wastes discharged at the site.
7. The exterior surfaces of the disposal area shall be graded to promote lateral runoff of precipitation and to prevent ponding.
8. There shall be no discharge of leachate to Doyle Creek or its tributaries.

9. There shall be no discharge of leachate to land which is not controlled by the discharger.
10. During the rainy season, only the active area of waste placement shall be left exposed to rainfall. The active area shall not be excessively large for daily waste placement operation. The inactive areas of waste placement shall be capped with at least one foot of earthen material compacted to a permeability of 1×10^{-6} cm/sec. or less. Final cover shall consist of at least two feet of earthen material compacted to a permeability of 1×10^{-6} cm/sec. or less.
11. The disposal area shall be protected from any washout or erosion of wastes or covering material, and from inundation which could occur as a result of floods having a predicted frequency of once in 100 years.
12. Annually, prior to the anticipated rainfall period, all necessary runoff diversion facilities shall be in place to prevent erosion or flooding of the site.
13. No liquids shall be deposited at this site, and water used during the disposal site operations shall be limited to a minimal amount reasonable necessary for dust control, compaction, and fire control.
14. The discharger shall remove and relocate any wastes which are discharged at this site in violation of these requirements.

B. PROVISIONS:

1. The discharger shall comply with the Monitoring and Reporting Program No. 78-125 and the General Provisions for Monitoring and Reporting as specified by the Executive Officer.
2. The discharger shall maintain a copy of this order so as to be available at all times to site operating personnel.
3. The discharger shall file with this Board a report of any material change or proposed change in the character, location or quantity of this waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries, contours or ownership of the disposal area.
4. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the discharger, the discharger shall notify the succeeding owner or operator of the existence of this order by letter, a copy of which shall be forwarded to this Board.
5. The discharger shall file a written report within 90 days after the total quantity of wastes discharged at this site equals 75 percent of the reported capacity of the site. The report shall contain a schedule for studies, design and other steps needed to provide additional capacity, or the total quantity discharged shall be limited to the reported capacity.

6. The discharger shall permit the Regional Board:
 - a. entry upon premises in which an effluent source is located or in which any required records are kept;
 - b. access to copy any records required to be kept under terms and conditions of this order;
 - c. inspection of monitoring equipment or records; and
 - d. sampling of any discharge.

7. In the event the discharger is unable to comply with any of the conditions of this order due to:
 - a. breakdown of waste treatment equipment;
 - b. accidents caused by human error or negligence; or
 - c. other causes such as acts of nature;

the discharger shall notify the Executive Officer by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the non-compliance and shall indicate what steps were taken to correct the problem and the dates thereof, and what steps are being taken to prevent the problem from recurring.

8. Ninety (90) days prior to discontinuing the use of this site for waste disposal the discharger shall submit a technical report to the Board describing the methods and controls to be used to assure protection of the quality of surface and groundwaters of the area during final operations and with any proposed subsequent use of the land. This report shall be prepared by or under the supervision of a registered engineer or a certified engineering geologist. The method used to close the site and maintain protection of the quality of surface and groundwaters shall comply with waste discharge requirements established by the Regional Board.

9. This Board considers the property owner to have a continuing responsibility for correcting any problems which may arise in the future as a result of this waste discharge or water applied to this property during subsequent use of the land for other purposes.

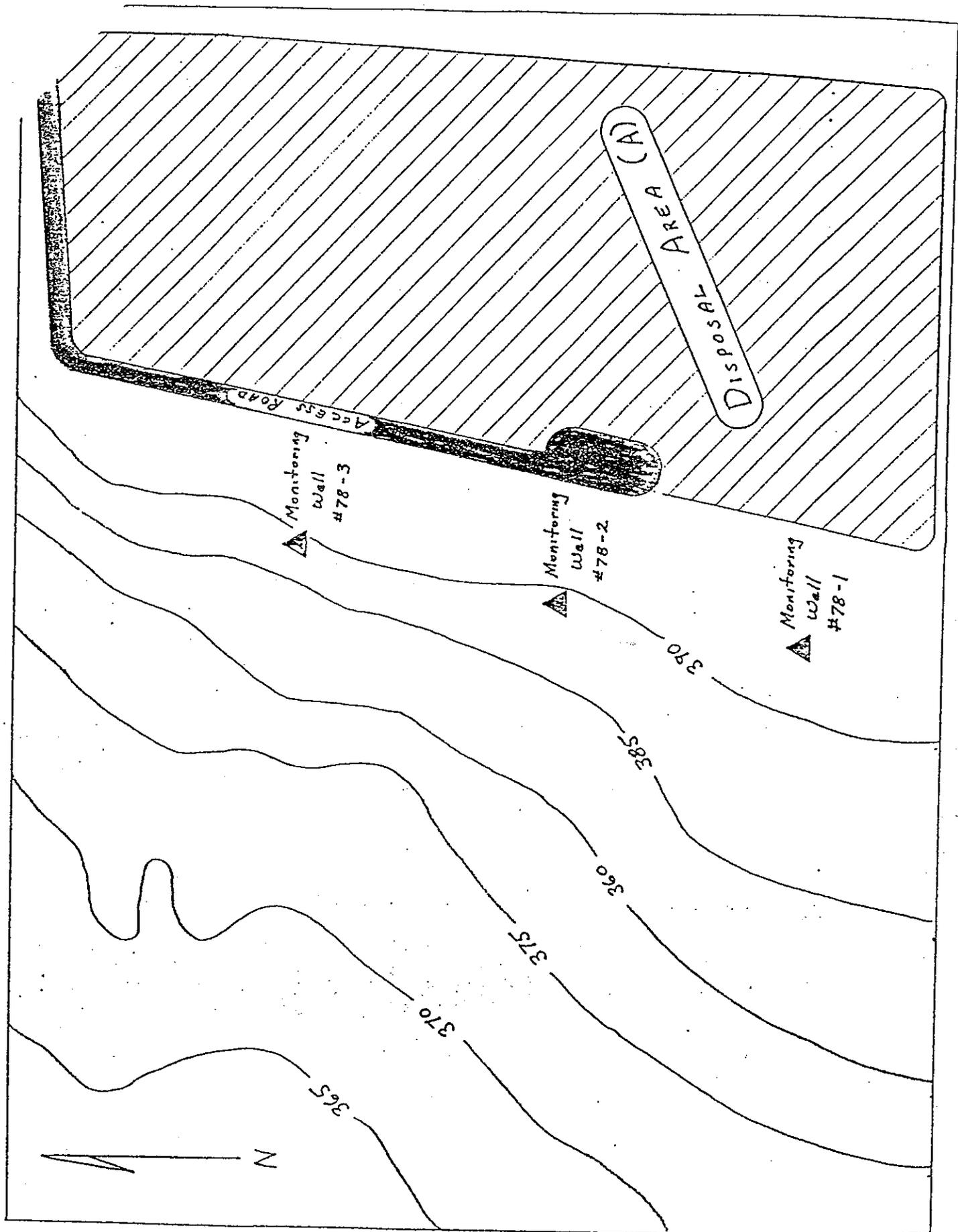
Certification

I, David C. Joseph, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on July 27, 1978.

ORIGINAL SIGNED BY

David C. Joseph
Executive Officer

CLASS II-2 CASPER SOLID WASTE DISPOSAL SITE



Attachment - B

CAPACITY ESTIMATE AND SITE LIFE CALCULATION

ASSUME:

- (1) Landfill only on areas East of the 395 ft contour as per current discharge requirements.
- (2) Finished top of fill elevation = 440 feet, side slopes 3:1

Capacity available under 3:1 side slopes around the edge of the fill:

difference in elevation: 440-395=45ft
horizontal distance at 3:1 : 135 ft
lin ft of unfilled edge: 190 + 675 + 325 = 1190 ft

$$V_I = \frac{(45)(135)}{2} (1190) = 3,614,625 \text{ ft}^3 = \underline{133,875 \text{ yd}^3}$$

Capacity available under 440 ft roof (not including volume under side slopes calculated above):

difference in elevation: 440 - 405 = 35 ft
area available (interim plan): 330 ft x 405 ft = 133,650 ft²

$$V_{II} = (35)(133,650) = 4,677,750 \text{ ft}^3 = \underline{173,250 \text{ yd}^3}$$

Total unused capacity (V_I+V_{II}):

$$V_{\text{total}} = \underline{307,125 \text{ yd}^3}$$

Quantity of solid wastes received:

from page 2 of report, use 25 tons/day

$$(25 \text{ tons/day})(365 \text{ days/yr}) = \underline{9125 \text{ tons/yr}}$$

ASSUME:

- (3) In place density of refuse = 800 lb/yd³
- (4) 20% loss of usable volume due to cover material

Site life:

$$\text{refuse in: } \frac{(9,125 \text{ tons/yr})(2,000 \text{ lb/ton})}{800 \text{ lb/yd in place}} = \underline{22,812 \text{ yd}^3/\text{yr}} \text{ in place}$$

$$\text{years to utilize : } \frac{(.80)(307,125 \text{ yd}^3)}{22,812 \text{ yd}^3/\text{yr in place}} = 10.8 \text{ years}$$

USE 11 YEARS REMAINING LIFE

APPENDIX B
WELL LOGS AND CONSTRUCTION INFORMATION

TABLE 1. SUMMARY OF COMPLETION DETAILS FOR SUBSURFACE MONITORING POINTS

Well Information	78-1	78-2	78-3	87-1	87-2	87-3
Top of Casing Elevation (feet)	393.68'	392.73'	393.26'	416.29'	397.67'	371.80'
Total depth of well borehole	29'	25'	25'	26.5'	20'	15'
Diameter of well casing	6" PVC	6" PVC	6" PVC	4" PVC	4" PVC	4" PVC
Total depth of well casing (BGS)	29'	25'	25'	25'	20'	14.5'
Type of well construction (drilling method)	24" Bucket auger	24" Bucket auger	24" Bucket auger	12" HSA	12" HSA	12" HSA
Perforated interval (BGS) Type of perforations	10' to 29' ----- saw slots	10' to 25' ----- saw slots	10' to 25' ----- saw slots	15' to 25' ----- 0.02" slots	10' to 20' ----- 0.02" slots	9.5' - 14.5' ----- 0.02" slots
Well driller	Kelly Pump & Drilling	Kelly Pump & Drilling	Kelly Pump & Drilling	Herzog & Assoc.	Herzog & Assoc.	Herzog & Assoc.
Year of well construction	1978	1978	1978	1987	1987	1987
Use of well	Monitoring	Monitoring	Monitoring	Monitor	Monitoring	Monitoring
Depth (BGS) and type of seals	0' to 10' concrete	0' to 10' concrete	0' to 10' concrete	0' to 10.5' C5B; 10.5' to 12' BP	0' to 6.5' C5B; 6.5' to 8' BP	0' to 5.5' C5B; 5.5' to 7' BP
Type(s) of well logs	DWR	DWR	DWR	SEL	SEL	SEL
Depth to first encountered groundwater (BGS)	10'	10'	10'	21'	13'	9.5'
Stabilized depth to groundwater from TOC and date of measurement	14.2' (6/92)	11.1' (6/92)	11.5' (6/92)	20.6' (6/92)	13.3' (6/92)	6.8' (6/92)
Aquifer Tests, type and date	2/78; 20 gpm discharge	2/78; 30 gpm discharge	2/78; 25 gpm discharge	None	None	None
Water quality sampling	from 3/87 to current	from 3/87 to current	from 3/87 to current	from 10/87 to current	from 10/87 to current	from 10/87 to current

TABLE 1. CONTINUED

Well Information	87-4	88-2	88-3	91-1F	91-2	91-3
Top of Casing Elevation	387.24'	392.61'	382.37'	388.73'	381.62'	416.19'
Total depth of well borehole (BGS)	20'	25'	25'	60'	13'	15.8'
Diameter of well casing	4" PVC	4" PVC	4" PVC	4" PVC	4" PVC	4" PVC
Total depth of well casing (BGS)	19.5'	25'	25'	57'	12'	15.09'
Type of well construction (drilling method)	12" PVC	10" Air Rotary	10" Air Rotary	18"/8" HSA, CME-95	12" HSA, CME-95	12" HSA, CME-750
Perforated interval (BGS) ----- Type of perforations	9.5' - 19.5' ----- 0.02" slots	15' to 25' ----- 0.02" slots	15' to 25' ----- 0.02" slots	47' to 57' ----- 0.02" slots	2' to 12' ----- 0.02" slots	4.25' to 13.95' ----- 0.02" slots
Well driller	Herzog & Assoc.	Kelly Pump & Drilling	Kelly Pump & Drilling	All Terrain	All Terrain	All Terrain.
Year of well construction	1987	1988	1988	1991	1991	1991
Use of well	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Depth (BGS) and type of seals	0' - 5' C5B; 5' - 6.5' BP	0' to 15' concrete	0' to 15' concrete	0' to 32.5' C5B; 32.5' to 36.5' BP	0' to 0.5' C5B; 0.5' to 1.0' BP	0' to 0.33' concrete; 0.33' - 2.0' neat cement; 2.0' to 3.3' BP
Type(s) of well logs	SEL	DWR	DWR	SEL	SEL	SEL/CD
Depth to first encountered groundwater (BGS)	7'	11'	10'	35' (Franciscan water)	5'	5'
Stabilized depth to groundwater (from TOC) and date of measurement	4.4' (6/92)	9.6' (6/92)	2.8' (6/92)	5.6' (6/92)	2.4' (6/92)	4.1' (6/92)
Aquifer Tests, type and date	None	None	None	None	Drawdown (3/91)	Drawdown (3/92)
Water Quality sampling	from 10/87 to current	from 11/88 to current	from 11/88 to current	from 3/91 to current	from 3/91 to current	from 12/91 to current

TABLE 1. CONTINUED

Well Information	91-4	91-5	91-6	91-7	92-1	92-2
Top of Casing Elevation (feet)	371.06'	365.57'	362.84'	374.05'	Not yet surveyed	Not yet surveyed
Total depth of well borehole (BGS)	20.5'	20'	20'	20'	13'	11'
Diameter of well casing	4" PVC	2" PVC	2" PVC	2" PVC	4" PVC	4" PVC
Total depth of well casing (BGS)	18.44'	18.96'	19.91'	18.29'	12'	9'
Type of well construction (drilling method)	12" HSA, CME-750	8" HSA, CME-750	8" HSA, CME-750	8" HSA, CME-750	12" HSA, CME-95	12" HSA, CME-95
Perforated interval (BGS) ----- Type of perforations	9.25' to 18.75' ----- 0.02" slots	9.25' to 18.75' ----- 0.02" slots	9.25' to 18.75' ----- 0.02" slots	9.25' to 18.75' ----- 0.02" slots	6' - 11.75' ----- 0.02" slots	2' to 8.75' ----- 0.02" slots
Well driller	All Terrain	All Terrain	All Terrain	All Terrain	All Terrain	All Terrain
Year of well construction	1991	1991	1991	1991	1992	1992
Use of well	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring	Monitoring
Depth (BGS) and type of seals	0' to 0.33' concrete; 0.33' - 3.5' neat cement; 3.5' to 5.0' BP	0' to 0.5' concrete; 0.5' to 3.5' neat cement; 3.5' to 4.5' BP	0' to 1.0' concrete; 1.0' to 2.5' neat cement; 2.5' to 3.5' BP	0' to 1.0' concrete; 1.0' to 2.5' neat cement; 2.5' to 3.5' BP	0' to 0.5' concrete; 0.5' - 4.0' neat cement; 4.0' - 5.0' BP	0' to 0.5' concrete; 0.5' to 1.0' neat cement; 1.0' to 2.0' BP
Type(s) of well logs	SEL/CD	CD	CD	CD	SEL	SEL
Depth to first encountered groundwater (BGS)	11'	Not measured	Not measured	Not measured	8.6'	4.1'
Stabilized depth to groundwater (from TOC) and date of measurement	7.4' (6/92)	5.68' (1/92)	3.45' (1/92)	10.50' (1/92)	10.8' (8/92)	5.5' (8/92)
Aquifer Tests, type and date	Slug (3/92)	Slug (3/92)	Slug (3/92)	Slug (3/92)	None	None
Water Quality sampling	from 12/91 to current	from 2/92 to current	from 2/92 to current	from 2/92 to current	from 8/92 to current	from 8/92 to current

TABLE 1. CONTINUED

Well Information	P-1	P-2	P-3	P-4	P-5	L-1-P
Top of Casing Elevation	380.12'	396.53'	368.58'	400.96'	376.33'	445' ^d
Total depth of well borehole (BGS)	25'	28'	20'	20'	20'	43.2'
Diameter of well casing	1.5" PVC	1.5" PVC	2" PVC	2" PVC	2" PVC	2" steel, Sch. 80
Total depth of well casing (BGS)	22.5'	27'	18.42'	19.84'	18.97'	43.2'
Type of well construction (drilling method)	8" HSA, CME-750	8" HSA, CME-750	8" HSA, CME-750	8" HSA, CME-750	8" HSA, CME-750	Pushed casing with CME-750 drill rig
Perforated interval (BGS) ----- Type of perforations	16.5' to 22.5' ----- saw slots	21.5' to 27.5' ----- saw slots	9.25' to 18.75' ----- 0.02" slots	9.25' to 18.75' ----- 0.02" slots	9.25' to 18.75' ----- 0.02" slots	28.2' to 43.2' ----- 3/8" drill holes
Well driller	All Terrain	All Terrain	All Terrain	All Terrain	All Terrain	All Terrain
Year of well construction	1991	1991	1991	1991	1991	1992
Use of well	Piezometer	Piezometer	Piezometer	Piezometer	Piezometer	Leachate piezometer
Depth (BGS) and type of seals	0' to 3.5' C5B; 3.5' to 5' BP	0' to 3.5' C5B; 3.5' to 5' BP	0' to 1.0' concrete; 1.0' to 2.7' neat cement; 2.7' to 3.7' BP	0' to 1.2' concrete; 1.2' to 2.5' neat cement; 2.5' to 3.5' BP	0' to 1.0' concrete; 1' to 3' neat cement; 3' to 4' BP	None
Type(s) of well logs	SEL	SEL	CD	CD	CD	CD
Depth to first encountered groundwater (BGS)	10'	21'	Not measured	Not measured	Not measured	41.8' to leachate
Stabilized depth to groundwater (feet TOC) and date of measurement	11.7' (6/92)	17.8' (6/92)	4.53' (1/92)	7.86' (1/92)	13.34' (1/92)	Unable to measure because of casing blockage
Aquifer Tests, type and date	None	None	None	None	None	None
Water Quality sampling	--C	--C	--C	--C	--C	None

TABLE 1. CONTINUED

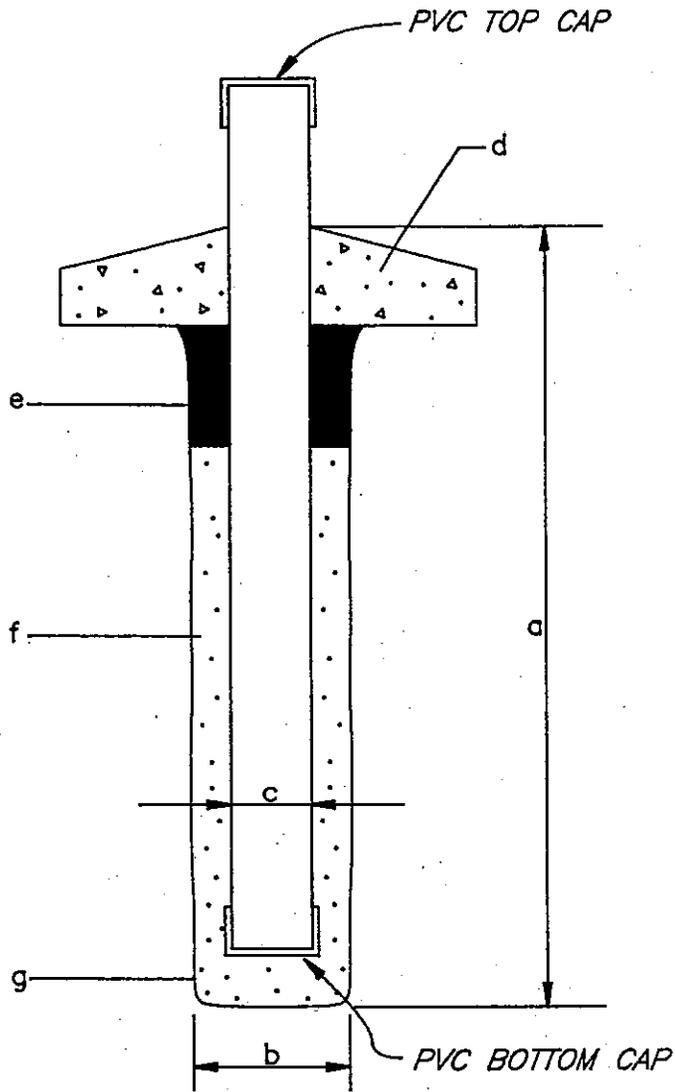
Well Information	L-2-P	L-3-P	L-4-P	L-5-P	L-7-E	L-8-E
Top of Casing Elevation	440' ^d	433' ^d	434' ^d	450' ^d	438' ^d (at 8/92 Grade)	447.5' ^d (at 8/92 Grade)
Total depth of well borehole (BGS)	36.0'	32.6'	40.7'	38.1'	41'	51'
Diameter of well casing	2" steel, Sch. 80	8" mild steel	8" mild steel			
Total depth of well casing (BGS)	36.0'	32.6'	40.7'	38.1'	40'	50'
Type of well construction (drilling method)	Pushed casing with CME-750 drill rig	18" HSA, CME-95	18" HSA, CME-95			
Perforated interval (BGS)	21' to 36'	12.4' to 32.4'	25.7' to 41.2'	23.1' to 38.6'	10' to 40'	10' to 50'
Type of perforations	3/8" drill holes	3/8" drill holes	3/8" drill holes	3/8" drill holes	0.05" wire-wrapped	0.05" wire-wrapped
Well driller	All Terrain	All Terrain	All Terrain	All Terrain	All Terrain	All Terrain
Year of well construction	1992	1992	1992	1992	1992	1992
Use of well	Leachate piezometer	Leachate piezometer	Leachate piezometer	Leachate piezometer	Leachate/Gas extraction well	Leachate/Gas extraction well
Depth (BGS) and type of seals	None	None	None	None	0' to 3' BP	0' to 3' BP
Type(s) of well logs	CD	CD	CD	CD	SEL	SEL
Depth to first encountered groundwater (BGS)	31.6' to leachate	dry	24.5' to leachate	37.6' to leachate	33.3' to leachate	dry
Stabilized depth to groundwater (from TOC), and date of measurement	Unable to measure because of casing blockage	40' to leachate	dry			
Aquifer Tests, type and date	None	None	None	None	Pretest conducted by County personnel	None
Water Quality sampling	None	None	None	None	from 8/92 to current	Not sampled (dry)

FOOTNOTES TO TABLE 1:

BGS = Below the Ground Surface
HSA = Hollow Stem Auger
SEL = Subsurface Exploration Log
CSB = Cement with 5 percent Bentonite
BP = Bentonite Pellets
DWR = Department of Water Resources
TOC = Top of Casing
CD = Construction Diagram

Notes:

- Construction details for site water supply well 88-1 are not included in this table, because this well is not utilized for water quality sampling purposes. The DWR Water Well Drillers' Report for well 88-1 is included in Appendix B. Construction details for leachate piezometer L-6-P are not included in this table, because this piezometer was abandoned due to auger refusal at 10 feet. No leachate was encountered in this piezometer.
- Groundwater elevations are measured monthly and reported in the County's quarterly monitoring report to the RWQCB.
- Monitored for water levels only (not sampled for water quality).
- Elevations are estimated based on topographic survey map.



NO SCALE

- | | | |
|----|----------------------------|----------------------------|
| a. | TOTAL DEPTH | 3' |
| b. | DIAMETER | 8" HAND DUG |
| c. | PVC PERFORATED
DIAMETER | 4", 0.020" SLOTTED |
| d. | CONCRETE SEAL | 0-0.5' INTERVAL |
| e. | BENTONITE PELLETS | 0.5-1.0' INTERVAL |
| f. | FILTER PACK | #3 SAND, 1.0-3.0' INTERVAL |
| g. | FILTER FABRIC LINER | |

MENDOCINO COUNTY
 CASPAR SOLID WASTE DISPOSAL SITE
 FINAL CLOSURE AND PHASE 1
 CORRECTIVE ACTIONS PLAN
**SPRING MONITORING STATION
 CONSTRUCTION DETAIL**

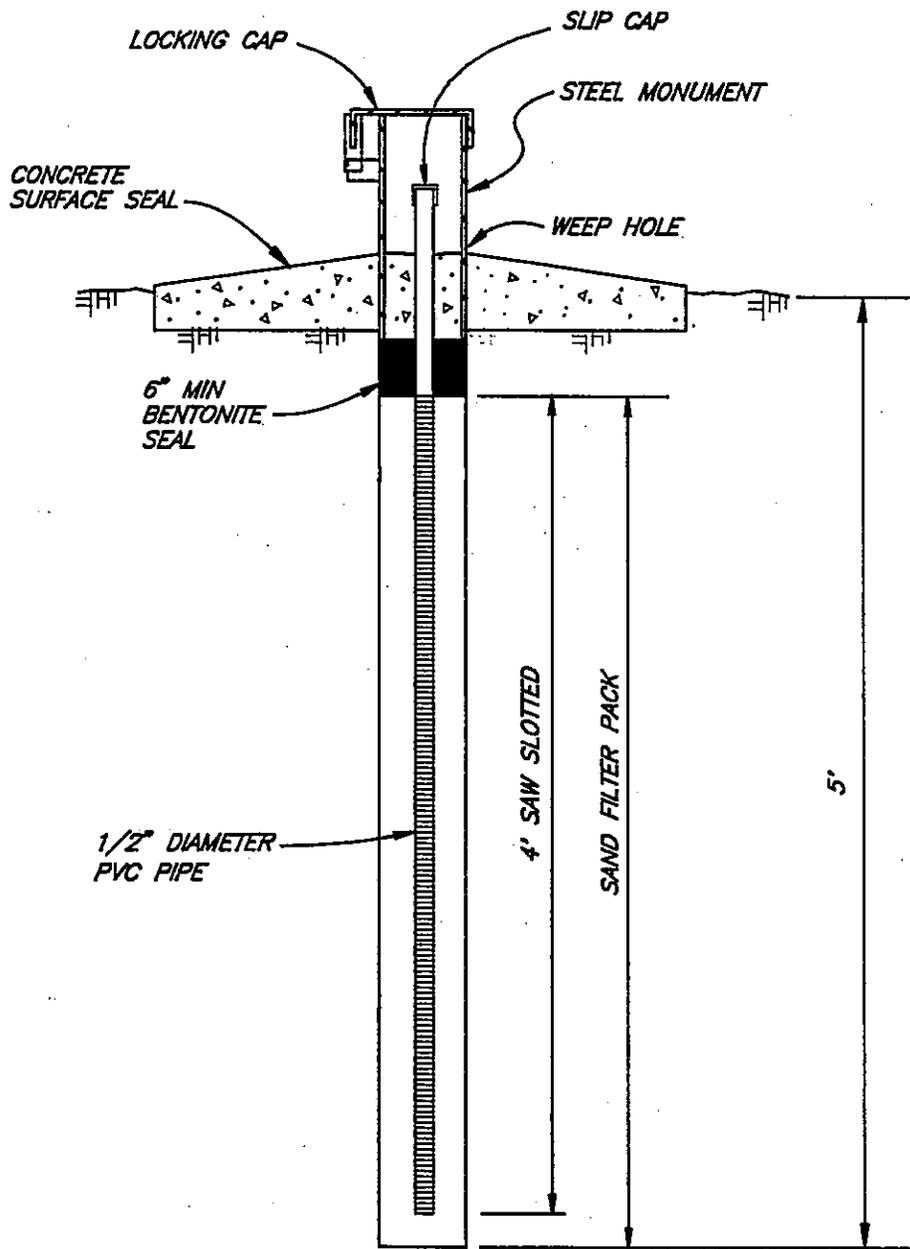
SHN 920005.1

JUNE, 1993

FIGURE 2



SPRING



NO SCALE

MENDOCINO COUNTY
 CASPAR SOLID WASTE DISPOSAL SITE
 FINAL CLOSURE AND PHASE 1
 CORRECTIVE ACTION PLAN

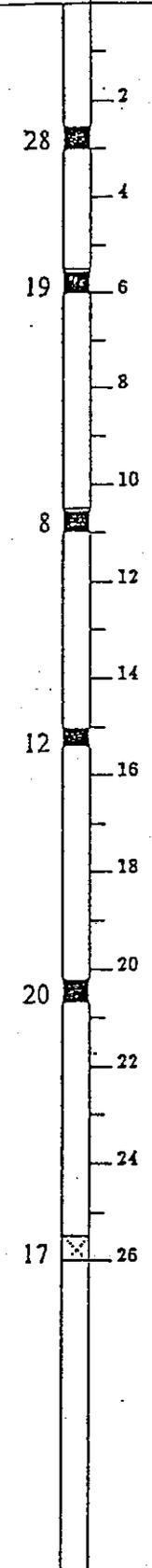
**GAS MIGRATION MONITORING
 PROBE CONSTRUCTION DETAIL**

SHN 920005.1
 JUNE, 1993
 FIGURE 3



CASW/1

78, 87, AND 88 SERIES WELLS



MOTTLED GRAY TO ORANGE-BROWN CLAYEY SAND(SC)
 medium dense, moist

becoming less clayey, with increase in moisture

color change to gray; wet to saturated

LIGHT RED-BROWN TO ORANGE BROWN GRAVELLY CLAYEY SAND(SC)
 medium dense, wet

increase in gravels

∇ Water level 8-11-87
 ∇ Water Level 10-14-87

GRAY CLAYEY GRAVEL(GC)
 medium dense, saturated

BOTTOM OF BORING 1 @ 26.5 FEET
 Hole Converted to Monitoring Well 87-1

** Elevation Reference: Extrapolated from Well Location Plan, Eljumailli & Butler Assoc., dated October, 1987.

Converted to equivalent standard penetration blow counts.

RONALD
 HERZOG
 & ASSOCIATES
 GEOTECHNICAL AND
 ENVIRONMENTAL CONSULTANTS

Job No:
 15038.01.00.7
 Geologist:
 CJK
 License No:
 1231

LOG OF BORING 1

CASPAR LANDFILL

Caspar, California

PLATE
 2

er
poratory
its

Blows/
Foot *

Depth
(feet)

Equipment: 12" Hollow Auger
Logged By: C. Kramer

Elevation: 396.5 **
Date Drilled: 8-12-87

meability,
e Plate 11

33

12

11

15

2

4

6

8

10

12

14

16

18

20

ORANGE-BROWN CLAYEY SAND(SC)
medium dense, moist, with red-brown staining

color change to gray to red-brown

becomes coarser grained, wet to saturated

Water Level 8-12-87
Water Level 10-14-87

BROWN CLAYEY SAND(SC-SP)
medium dense, saturated

BOTTOM OF BORING 2 @ 20 FEET
Hole Converted to Monitoring Well 87-2

Converted to equivalent standard
penetration blow counts.

** Elevation Reference: Extrapolated from Well
Location Plan, Eljumaity & Butler Assoc.,
dated October, 1987.

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Geologist:
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1231

LOG OF BORING 2

CASPAR LANDFILL
Caspar, California

PLATE

3

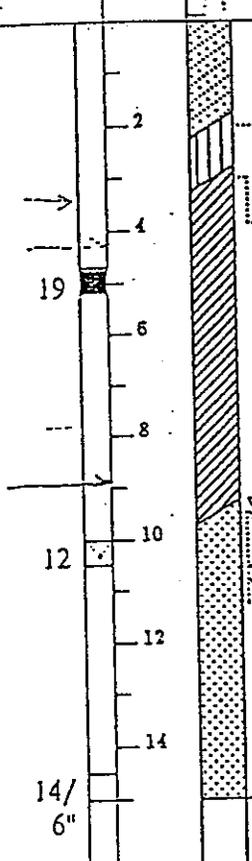
her
laboratory
ests

Blows/
Foot *

Depth
(feet)

Equipment: 12" Hollow Auger
Logged By: C. Kramer

Elevation: 510.5
Date Drilled: 8-13-87



ORANGE-BROWN TO LIGHT GRAY CLAYEY SAND(SC)
medium dense, moist, (fill)

DARK GRAY SANDY SILT(ML)
medium stiff, moist, (old top soil)

GRAY SANDY CLAY(CL)
medium stiff, wet, with minor sand lenses

Water Level 8-13-87
Water Level 10-14-87

BROWN SAND(SP)
medium dense, saturated, with minor organics

14/6"

BOTTOM OF BORING 3 @ 15 FEET
Hole Converted to Monitoring Well 87-3

* Covered to equivalent standard penetration blow counts.

** Elevation Reference: Extrapolated from Well Location Plan, Eljumaily & Butler Assoc., dated October, 1987.

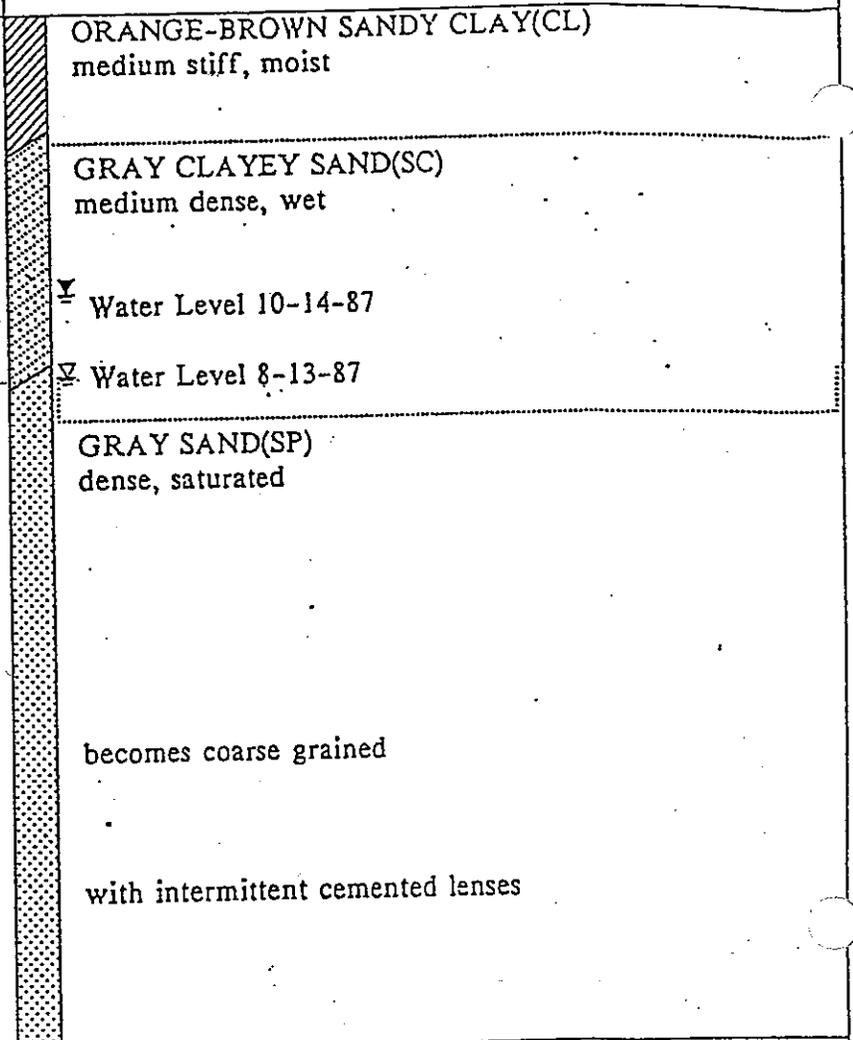
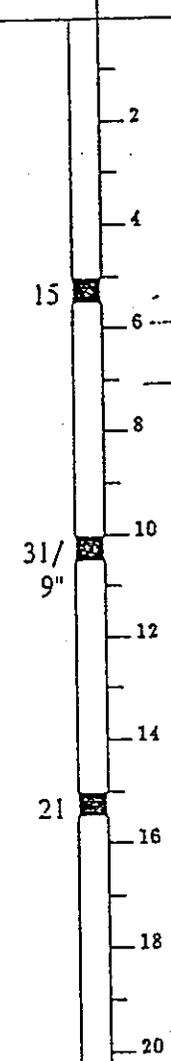
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Geologist:
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License No:
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LOG OF BORING 3
CASPAR LANDFILL
Caspar, California

PLATE
4

Permeability, see Plate 11



ORANGE-BROWN SANDY CLAY(CL)
medium stiff, moist

GRAY CLAYEY SAND(SC)
medium dense, wet

Water Level 10-14-87

Water Level 8-13-87

GRAY SAND(SP)
dense, saturated

becomes coarse grained

with intermittent cemented lenses

BOTTOM OF BORING 4 @ 20 FEET
Hole Converted to Monitoring Well 87-4

* Covered to equivalent standard penetration blow counts.

** Elevation Reference: Extrapolated from Well Location Plan, Eljurnaily & Butler Assoc., dated October, 1987.

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LOG OF BORING 4
CASPAR LANDFILL
Caspar, California

PLATE
5

MAJOR DIVISIONS			TYPICAL NAMES	
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 40 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN HALF IS SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
		OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS	Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS		

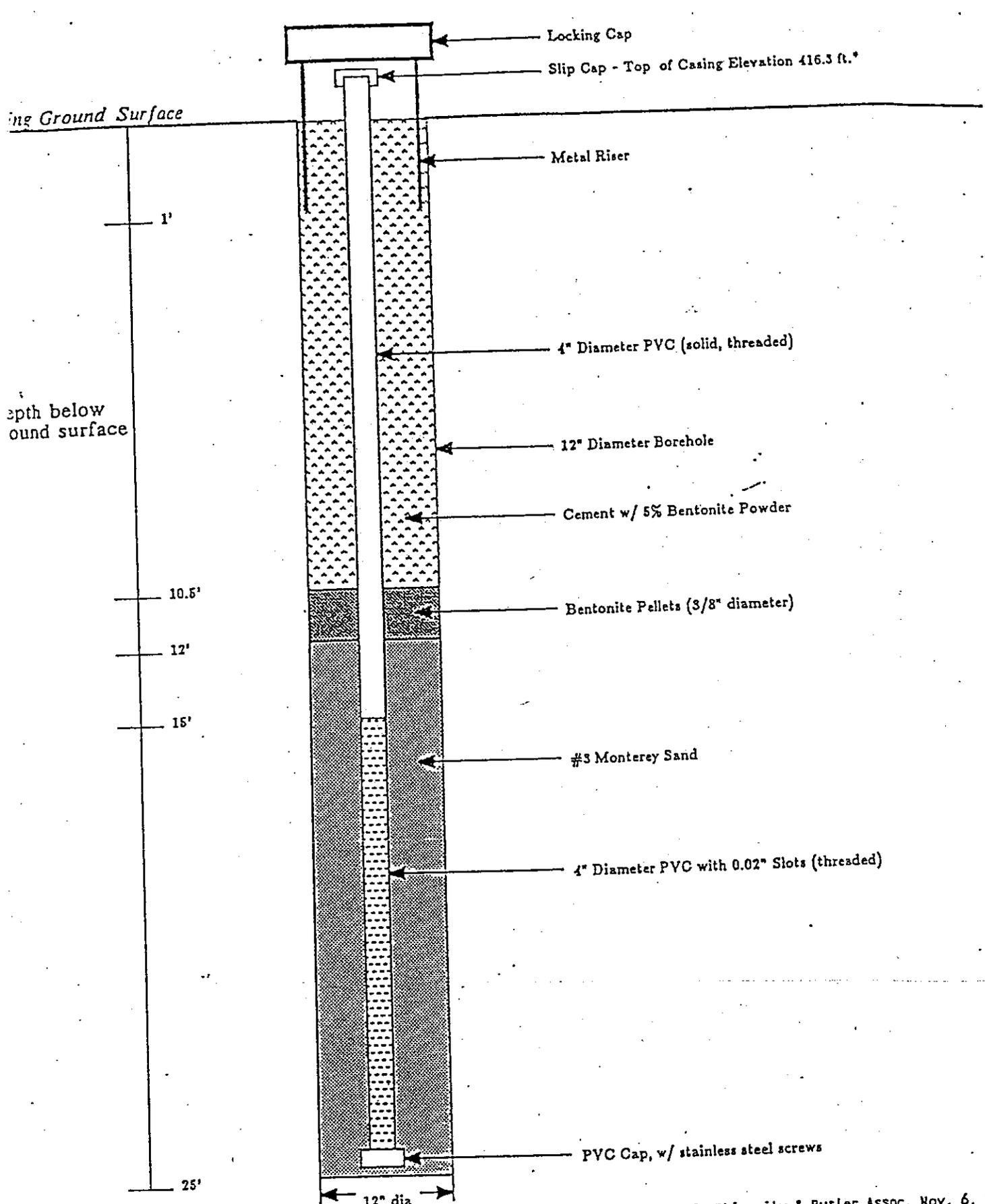
UNIFIED SOIL CLASSIFICATION SYSTEM

		Shear Strength, psf	Confining Pressure, psf	
Consol	- Consolidation	Tx	320 (2600)	Unconsolidated Undrained Triaxial
LL	- Liquid Limit (In %)	Tx CU	320 (2600)	Consolidated Undrained Triaxial
PL	- Plastic Limit (In %)	DS	2750 (2000)	Consolidated Drained Direct Shear
PI	- Plasticity Index	FVS	470	Field Vane Shear
G _s	- Specific Gravity	UC	2000	Unconfined Compression
SA	- Sieve Analysis	LVS	700	Laboratory Vane Shear
<input checked="" type="checkbox"/>	"Undisturbed" Sample	SS	- Shrink Swell	
<input checked="" type="checkbox"/>	Bulk or Disturbed Sample	EXP	- Expansion	
<input checked="" type="checkbox"/>	Standard Penetration Test	P	- Permeability	
<input type="checkbox"/>	Sample Attempt with No Recovery			

Note: All strength tests on 2.8" or 2.4" diameter samples unless otherwise indicated.

KEY TO TEST DATA

DONALD HERZOG & ASSOCIATES GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS	Job No: 15038.01.00.7	SOIL CLASSIFICATION AND KEY TO TEST DATA CASPAR LANDFILL Caspar, California	PLATE
	Appr: <i>cu</i> Drwn: PD		
	Date: November 1987		6



Completion Date: Aug 11, 1987

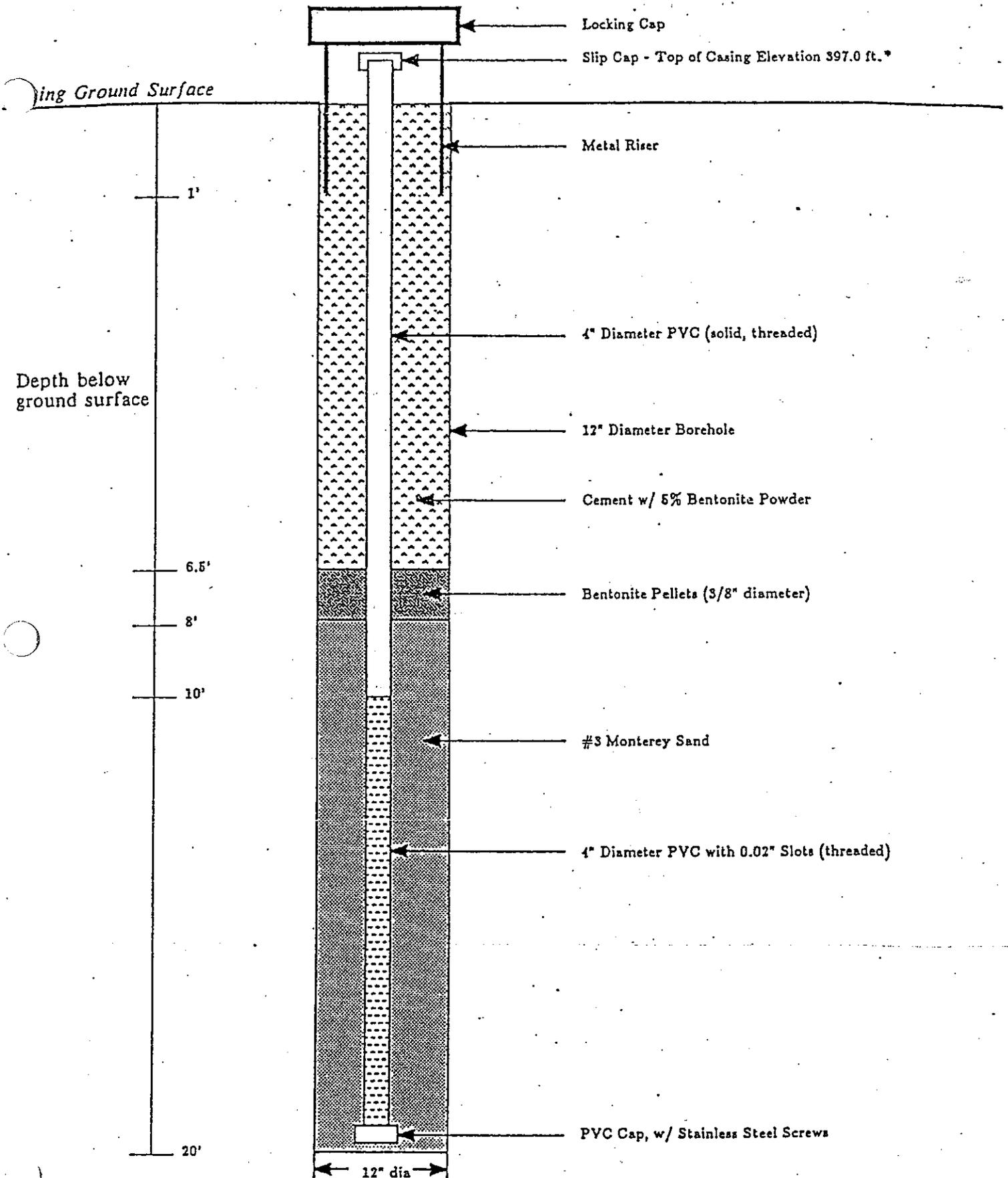
* Ref: Eljaily & Butler Assoc. Nov. 6, 1987

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GEO-TECHNICAL AND
ENVIRONMENTAL CONSULTANTS

Job No:
15038.01.00.7
Appr: *CLL* / PD
Date:
November 1987

MONITORING WELL 87-1 DETAILS
CASPAR LANDFILL
Caspar, California

PLATE
7



ing Ground Surface

Depth below ground surface

1'
6.5'
8'
10'
20'

Locking Cap
Slip Cap - Top of Casing Elevation 397.0 ft.*
Metal Riser
4" Diameter PVC (solid, threaded)
12" Diameter Borehole
Cement w/ 5% Bentonite Powder
Bentonite Pellets (3/8" diameter)
#3 Monterey Sand
4" Diameter PVC with 0.02" Slots (threaded)
PVC Cap, w/ Stainless Steel Screws

12" dia

Revision Date: Aug 12, 1987

* Ref: Eljaily & Butler Assoc., Nov. 6, 1987

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ENVIRONMENTAL CONSULTANTS

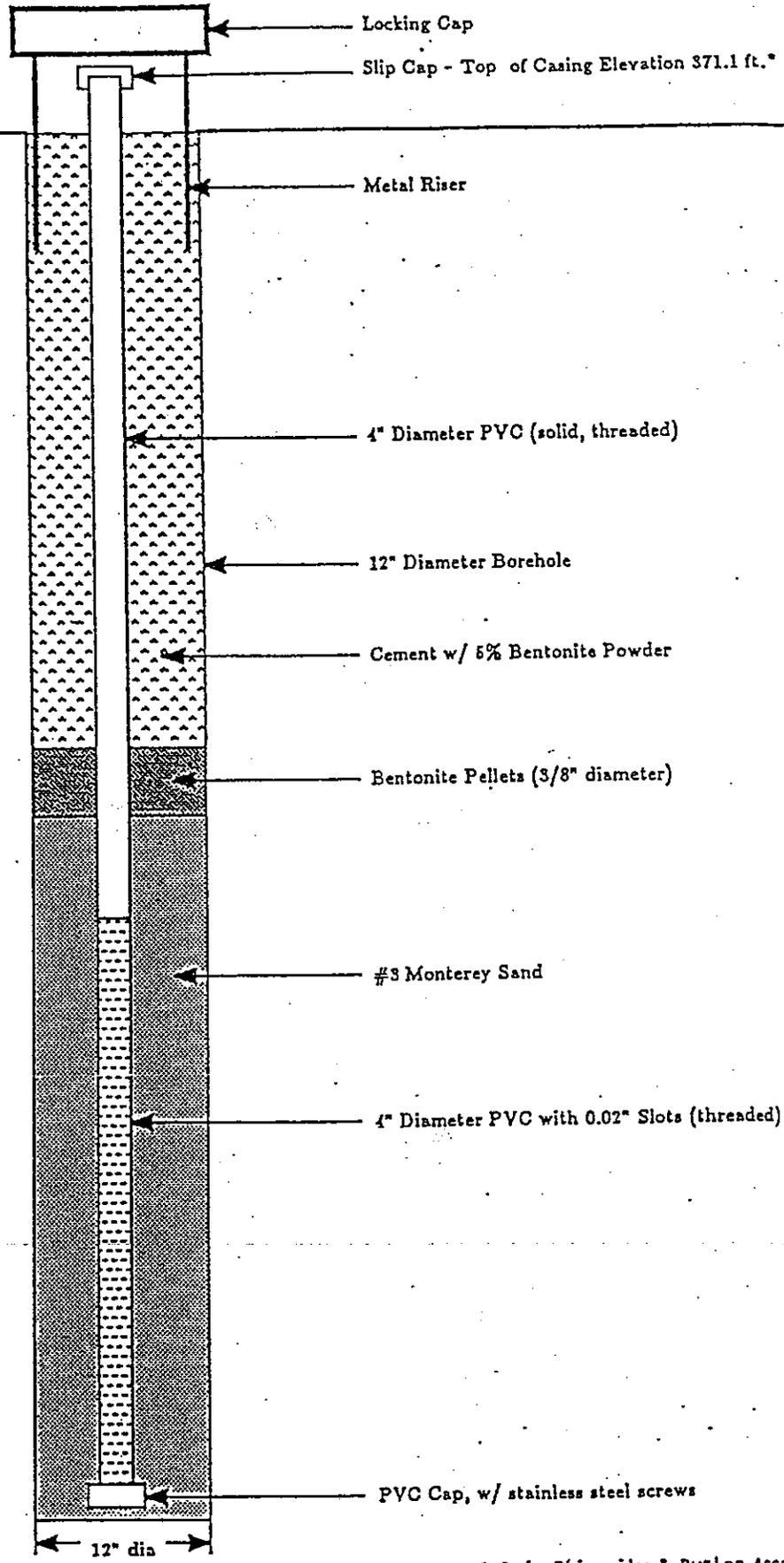
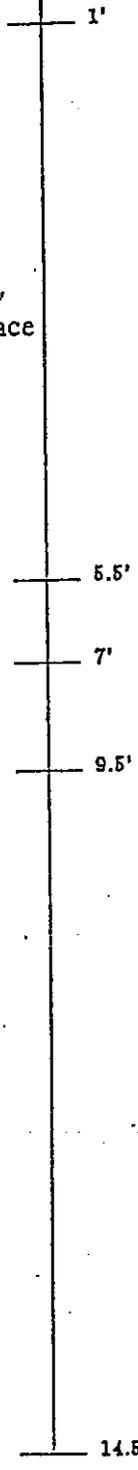
Job No:
15038.01.00.7
Appr: *WC* PD
Date:
January 1988

MONITORING WELL 87-2 DETAILS
CASPAR LANDFILL
Caspar, California

PLATE
8

Existing Ground Surface

Depth below ground surface



Completion Date: Aug 13, 1987

* Ref: Eljumaily & Butler Assoc. Nov. 6, 198

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Date:
November 1987

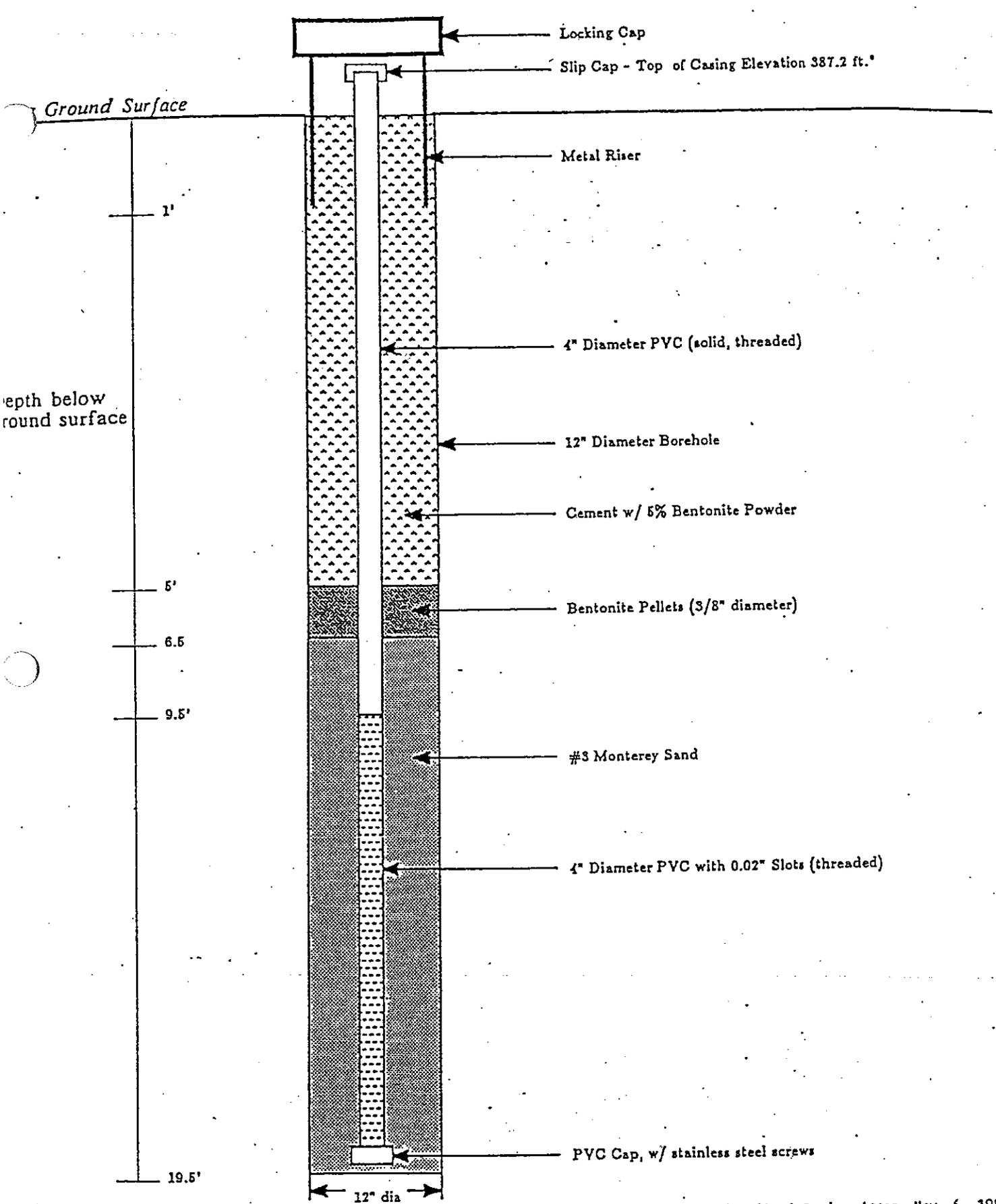
MONITORING WELL 87-3 DETAILS

CASPAR LANDFILL

Caspar, California

PLATE

9



on Date: Aug 13, 1987

* Ref: Eljaily & Butler Assoc. Nov. 6, 1987

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Job No:
 15038.01.00.7
 Appr: *ER* Drwn: PD
 Date:
 November 1987

MONITORING WELL 87-4 DETAILS
 CASPAR LANDFILL
 Caspar, California

PLATE
 10

91 SERIES WELLS AND PIEZOMETERS

CASPAR LANDFILL
900189.230

ADJUSTED TOP OF CASING ELEVATIONS

3/92

- 91-1F TOC = 388.65, New TOC = 388.73
Top of steel casing very irregular.
- 91-2 TOC = 381.55, Top of Steel casing (+ 0.29)
Added PVC cap = 0.22 below steel casing, new TOC = 381.62
Total depth = 13.35, Steel casing = 1.3 feet above ground.
- 91-3 TOC = 416.06, Top of Steel casing (+ 1.18)
Added PVC cap = 1.05 below steel casing, new TOC = 416.19
Total depth = 15.48, steel casing = 2.3 above ground.
- 91-4 TOC = 371.96, Top of Steel casing (+ 0.90)
Added PVC cap = 0.80 below steel casing, new TOC = 372.06
Total depth = 20.49, Steel casing 2.5 feet above ground.
- 91-5 (33P) TOC = 365.54, Top of Steel casing (+ 0.31)
Added PVC cap = 0.28 below steel casing, new TOC = 365.57
Total depth = 20.38, Steel casing = 1.3 feet above ground.
- 91-6 (34P) TOC = 362.79, Top of Steel casing (+ 0.80)
Added PVC cap = 0.75 below steel casing, new TOC = 362.84
Total depth = 20.11, Steel casing = 0.6 feet above ground.
- 91-7 (40P) TOC = 374.01, Top of Steel casing (+ 0.12)
Added PVC cap = 0.08 below steel casing, new TOC = 374.05
Steel casing = 1.8 above ground.

BORING LOG KEY

SAMPLE TYPES



DISTURBED
SAMPLE



HAND
DRIVEN TUBE
SAMPLE



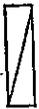
1.4" I.D.
STANDARD
PENETRATION
TEST SAMPLE
(SPT)



2.5" I.D.
MODIFIED
CALIFORNIA
SAMPLE
(NOT RETAINED)



MODIFIED
CALIFORNIA
SAMPLE
(RETAINED)



CORE
BARREL
SAMPLE
(NOT RETAINED)



CORE
BARREL
SAMPLE
(RETAINED)

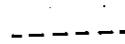
SYMBOLS



INITIAL WATER LEVEL



STABILIZED WATER LEVEL



GRADATIONAL CONTACT



WELL DEFINED CONTACT



CONSULTING ENGINEERS
& GEOLOGISTS
2830 Harrison Ave. (707)444-0427
Eureka, CA 95501 FAX (707)444-0183

HOLE NUMBER 91-1F

PROJECT Mendocino County
 LOCATION Caspar Landfill
 GROUND SURFACE ELEVATION _____
 EXCAVATION METHOD CME-95 18"/8"
 LOGGED BY TAS

JOB NUMBER 900189.200
 DATE DRILLED 2/20/91-2/21-91
 SAMPLER TYPE 5' Dry Core
2.5' Modified California
 TOTAL DEPTH OF HOLE 60 ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM
	1				SP	SAND, silty, clayey, dense, moist, yellowish red and reddish yellow. Weathered Marine Terrace deposits	<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">4" Sch. 40 PVC</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">grout</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">bentonite seal</div> </div>
	2					red strata	
	3					highly mottled, light yellow and red	
	4						
	5		6				
	6		16				
	7		17		SW	SAND, slightly silty, moist, yellowish brown. Marine Terrace deposits	
	8						
	9					becomes very moist	
	10						
	11						
	12				SP	SAND, dense, wet, brown. Marine Terrace deposits.	
	13						
	14					becomes gray	
	15						
	16				SW	SAND, dense, wet, gray, very coarse, clean, "running" sand. Marine Terrace deposits	
	17				SP		
	18						
	19						
	20						
	21						
	22					Pull augers, 6.5' heaving sands into augers	
	23						
	24						
	25						
	26				SP	SAND, dense, wet, gray, well sorted, well rounded, coarse, clean sand. Marine Terrace deposits	
	27						
	28						
	29					SAND, dense, wet, multicolor, no fines, heaving sands. Marine Terrace deposits	
	30						
	31						
	32					Base of Marine Terrace deposits	
	33						
	34					FRANCISCAN COMPLEX, damp, dense, olive; upper 2.4 feet highly weathered moist, stiff, silty clay, 4" transition to fractured mudstone	
	35						

HOLE NUMBER 91-1F

PROJECT Mendocino County

JOB NUMBER 900189.200

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM
	36					Hole reamed to 34.5' with 8" augers, sealed with 2.5' bentonite plug, 10" steel conductor casing set to 34', grout annulus to surface 2/21/91 After seal is set, drilled with 8" augers inside conductor casing, through bentonite plug into Franciscan Mudstone	
	37						
	38						
	39						
	40						
	41						
	42						
	43						
	44						
	45						
	46						
	47						
	48						
	49						
	50						
	51						
	52						
	53						
	54						
	55						
	56						
	57						
	58						
	59						
	60						
	61				Bottom of boring		
	62						
	63						
	64						
	65						
	66						
	67						
	68						
	69						
	70						
	71						
	72						
	73						
	74						
	75						

PROJECT Medocino County
 LOCATION Caspar Landfill
 GROUND SURFACE ELEVATION _____
 EXCAVATION METHOD CME-95 8"/12"
 LOGGED BY JLA

JOB NUMBER 900189.200
 DATE DRILLED 2/21/91
 SAMPLER TYPE _____
 TOTAL DEPTH OF HOLE 13 ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev. ft.
							WELL DIAGRAM
	1				SC	SAND, silty, clayey, dense, moist, reddish brown. Marine Terrace deposits	
	2				SC		
	3				SC		
	4				SM	SAND, silty, loose, very moist, yellowish gray. Marine Terrace deposits	
	5				SM	becomes wet	
	6				SM		
	7				SP	SAND, loose, wet, dark gray, coarse, subrounded poorly graded sands, "heaving" sand. Marine Terrace deposits	
	8				SP		
	9				SP		
	10				SP		
	11				SP		
	12				SP		
	13				SP		
	14					Bottom of Boring	
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

HOLE NUMBER P-1

PROJECT Mendocino County
 LOCATION Caspar Landfill
 GROUND SURFACE ELEVATION _____
 EXCAVATION METHOD CME-95 8"
 LOGGED BY JLA

JOB NUMBER 900189.200
 DATE DRILLED 2/21/91
 SAMPLER TYPE _____
 TOTAL DEPTH OF HOLE 25 ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM
	1				CL	CLAY, sandy, stiff, moist, dark brown, roots common, leaves, wood, topsoil	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">Top of Casing Elev. ft.</div> <div style="margin-top: 10px;">1.5" sch. 40 PVC</div> <div style="margin-top: 10px;">grout</div> <div style="margin-top: 10px;">Monterey #3 sand</div> <div style="margin-top: 10px;">bentonite seal</div> </div>
	2				CL	CLAY, sandy, dense, slightly moist, light yellowish brown. Weathered Marine Terrace deposits	
	3						
	4						
	5						
	6				SM	SAND, silty, clayey, dense, moist, yellowish brown. Marine Terrace deposits	
	7						
	8						
	9				SM	SAND, silty, dense, moist, yellowish gray	
	10				SC	SAND, clayey, dense, very moist to wet, yellowish brown. Marine Terrace deposits	
	11						
	12						
	13						
	14						
	15						
	16						
	17				CL	CLAY, sandy, silty, dense, moist, yellowish brown. Marine Terrace deposits	
	18						
	19						
	20						
	21						
	22						
	23					Base of Marine Terrace deposits	
	24					SILTSTONE/CLAYSTONE bedrock, weathered fractured, moist, Franciscan Complex	
	25						
	26					Bottom of boring	
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						

HOLE NUMBER P-2

PROJECT Mendocino County
 LOCATION Caspar Lndfill
 GROUND SURFACE ELEVATION _____
 EXCAVATION METHOD CME-95 8"
 LOGGED BY JLA

JOB NUMBER 900189.200
 DATE DRILLED 2/22/91
 SAMPLER TYPE _____
 TOTAL DEPTH OF HOLE 28 ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM	
							Top of Casing Elev. ft.	
	1					FILL, sandy, clayey, dense, moist, light yellowish gray, roots	<p>The well diagram shows a vertical cross-section of the borehole. At the top, there is a casing labeled '1.5" Sch. 40 PVC'. Below the casing, there is a section labeled 'grout'. Further down is a 'bentonite seal'. The main body of the well is filled with 'Monterey #3 sand'. At the bottom, there is a section labeled 'hand slotted'. A date '2/22/91' is marked on the right side of the diagram.</p>	
	2				SC	SAND, clayey, silty, dense, moist, light yellowish brown. Weathered Marine Terrace deposits		
	3				SM			
	4							
	5							
	6				SC	SAND, clayey, dense, moist, reddish brown to yellowish brown, mottled, occasional cemented fragments to 1" maximum diameter. Marine Terrace deposits		
	7							
	8							
	9							
	10							
	11							
	12							
	13				SW	SAND, slightly silty, dense, moist, gray, fine to coarse, well rounded, well graded sand. Marine Terrace deposits.		
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22				SP	SAND, dense, wet, gray, poorly sorted, heaving sands. Marine Terrace deposits		
	23							
	24							
	25							
	26							
	27							
	28							
	29					Bottom of Boring		
	30							
	31							
	32							
	33							
	34							
	35							



HOLE NUMBER 91-3

PROJECT Mendocino County
 LOCATION Caspar Landfill
 GROUND SURFACE ELEVATION 414.90ft.MSL
 EXCAVATION METHOD CME-750 HSA
 LOGGED BY JLA

JOB NUMBER 900189.230
 DATE DRILLED 12/9/91
 SAMPLER TYPE _____
 TOTAL DEPTH OF HOLE 15.8ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: 416.06 ft.
							WELL DIAGRAM
Balling to 2" diameter.	1			[Dotted pattern]	SC	SAND, clayey, loose, dry, yellowish gray.	
	2			[Diagonal hatching]	CL	CLAY, sandy, medium stiff, moist, mottled yellowish gray to light gray. Fine to medium grained sand.	
	3			[Diagonal hatching]	CL		
	4			[Dotted pattern]	SC	SAND, clayey, loose, wet, yellowish brown. Fine to coarse, subangular sand.	
	5						
	6						
	7						
	8					Increase in clay content. Slight color change to orangish brown.	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16					Bottom of boring at 15.8 feet.	
17							
18							
19							
20							
21							



HOLE NUMBER 91-4

PROJECT Mendocino County
 LOCATION Caspar Landfill
 GROUND SURFACE ELEVATION 370.40ft.MSL
 EXCAVATION METHOD CME-750 HSA
 LOGGED BY JPH

JOB NUMBER 900189.230
 DATE DRILLED 12/19/91
 SAMPLER TYPE 5' Dry Core Barrel
 TOTAL DEPTH OF HOLE 20.5ft.

REMARKS	DEPTH (ft.)	SAMPLES % RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM
					TOPSOIL	<p>Top of Casing Elev: 371.96 ft.</p> <p>4" Sch. 40 PVC cement concrete bentonite seal Monterey #3 sand 0.02" slotted PVC screen PVC plug</p>
	1		[Cross-hatched]	ML	SILT, sandy, medium stiff, moist, pinkish gray.	
	2		[Diagonal lines]	CL	CLAY, sandy, stiff, moist, light brown and yellowish brown. Fine to medium grained sand.	
	3	97				
	4					
	5				Sand becomes coarser grained, minor well graded gravel to 1/4" maximum diameter.	
	6	100	[Dotted]	SP	SAND, dense, moist, yellowish brown, manganese stained. Medium grained sand.	
	7					
	8					
	9	90	[Vertical lines]	ML	SILT, clayey, stiff, saturated, gray.	
	10		[Small circles]	SC	SAND, clayey, dense, moist, white. Occasional free water in soil voids.	
	11	90	[Dotted]	SP	SAND, dense, very moist, brown. Medium grained sand. Becomes wet.	
	12					
	13				Becomes gray brown, saturated.	
	14	80			Becomes clean, poorly graded, rounded, medium grained sand.	
	15					
	16	80				
	17					
	18					
	19		[Small circles]	SM	SAND, slightly silty, dense, moist, brown.	
	20					
	21				Bottom of boring at 20.5 feet.	

PROJECT: CASPAR LANDFILL

JOB NUMBER: 900189.230

91-3

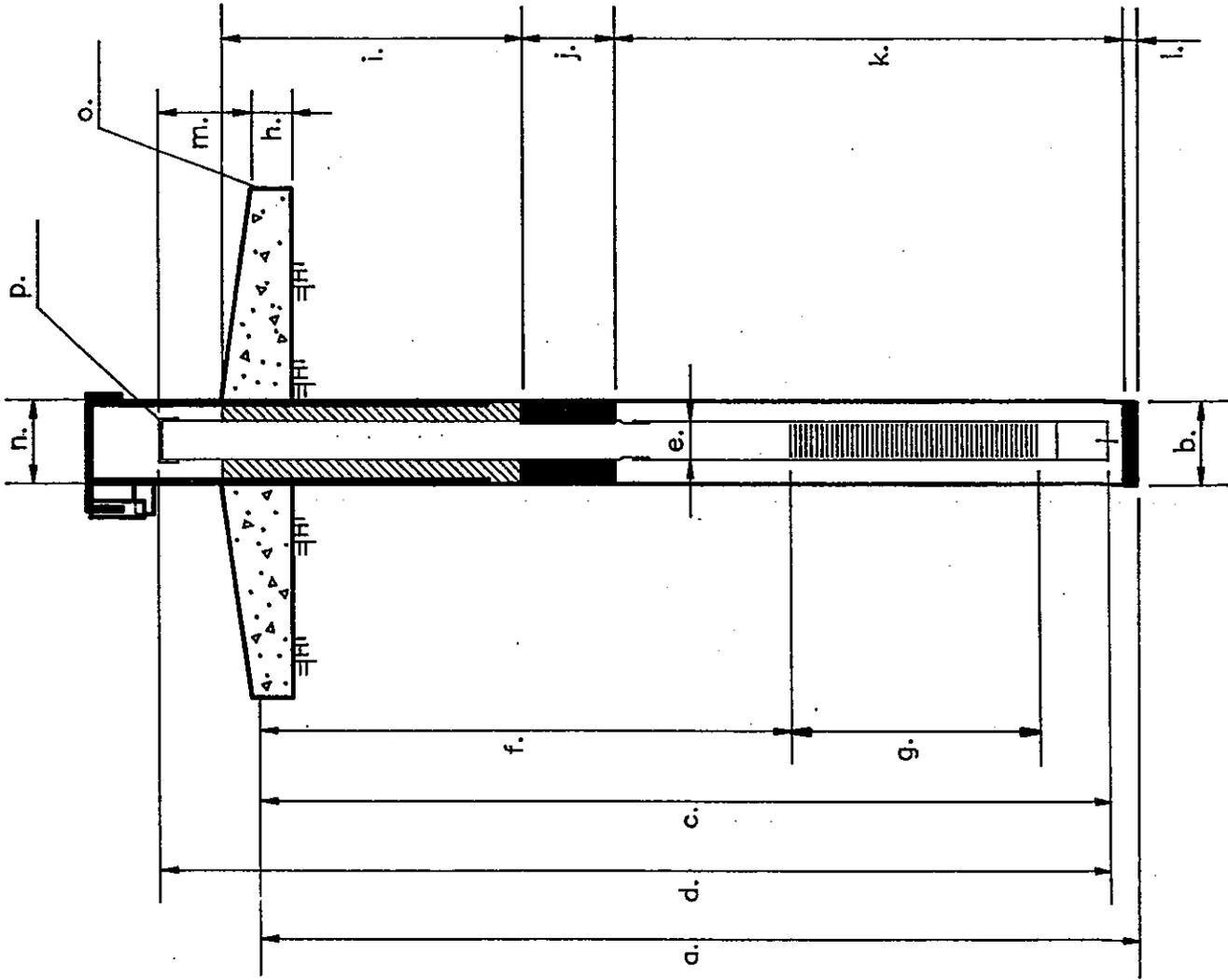
DATE 12/9/91

EXPLORATORY BORING

- a. TOTAL DEPTH 15.8 ft.
- b. DIAMETER 12 in.
- DRILLING METHOD CME 750 HOLLOW STEM AUGER

WELL CONSTRUCTION

- c. TOTAL WELL DEPTH 15.8 ft.
- d. CASING LENGTH 16.25 ft.
- MATERIAL SCH. 40, PVC
- e. DIAMETER 4 in.
- f. DEPTH TO TOP OF PERFORATIONS 4.45 ft.
- g. PERFORATED LENGTH 9.5 ft.
- PERFORATED INTERVAL FROM 4.45 to 13.95 ft.
- PERFORATION TYPE FACTORY SLOTTED
- PERFORATION SIZE 0.020 inch
- h. SURFACE SEAL 0-0.33 ft.
- SEAL MATERIAL MIX CONCRETE
- i. BACKFILL 0.33-2.0 ft.
- BACKFILL MATERIAL NEAT CEMENT
- j. SEAL 2.0-3.3 ft.
- SEAL MATERIAL BENTONITE PELLETS
- k. FILTER PACK 3.3-14.8 ft.
- PACK MATERIAL #3 SAND
- l. BOTTOM SEAL - ft.
- SEAL MATERIAL -
- m. PVC CASING STICK UP 1.16 ft.
- n. PROTECTIVE CASING DIAMETER 10 in.
- o. GROUND ELEVATION 414.90 ft.
- p. TOC ELEVATION 416.06 ft.



RECORD OF
MONITOR WELL CONSTRUCTION



PROJECT: CASPAR LANDFILL JOB NUMBER: 900189.230

91-4

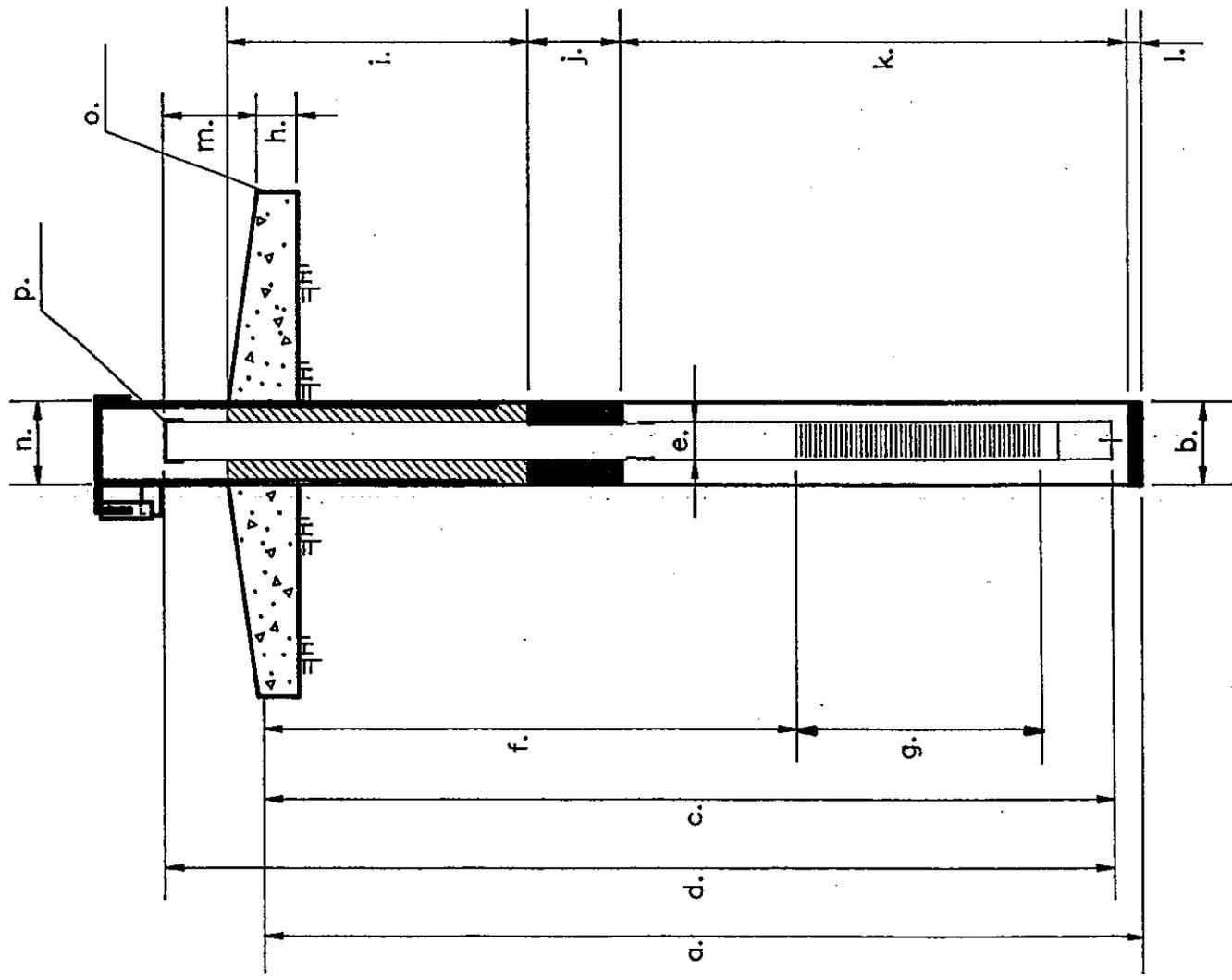
DATE 12/19/1991

EXPLORATORY BORING

- a. TOTAL DEPTH 20.5 ft
- b. DIAMETER 12 in
- DRILLING METHOD CME 750 HOLLOW STEM AUGER

WELL CONSTRUCTION

- c. TOTAL WELL DEPTH 19 ft
- d. CASING LENGTH 20 ft
- MATERIAL SCH. 40, PVC
- e. DIAMETER 4 in
- f. DEPTH TO TOP OF PERFORATIONS 9.25 ft
- g. PERFORATED LENGTH 9.5 ft
- PERFORATED INTERVAL FROM 9.25 to 18.75 ft
- PERFORATION TYPE FACTORY SLOTTED
- PERFORATION SIZE 0.020 inch
- h. SURFACE SEAL 0-0.33 ft
- SEAL MATERIAL CONCRETE
- i. BACKFILL 0.33-3.5 ft
- BACKFILL MATERIAL NEAT CEMENT
- j. SEAL 3.5-5.0 ft
- SEAL MATERIAL BENTONITE PELLETS
- k. FILTER PACK 5.0-20 ft
- PACK MATERIAL #3 SAND
- l. BOTTOM SEAL - ft
- SEAL MATERIAL -
- m. PVC CASING STICK UP 1.56 ft
- n. PROTECTIVE CASING DIAMETER 10 in
- o. GROUND ELEVATION 370.40 ft
- p. TOC ELEVATION 371.96 ft



RECORD OF
MONITOR WELL CONSTRUCTION



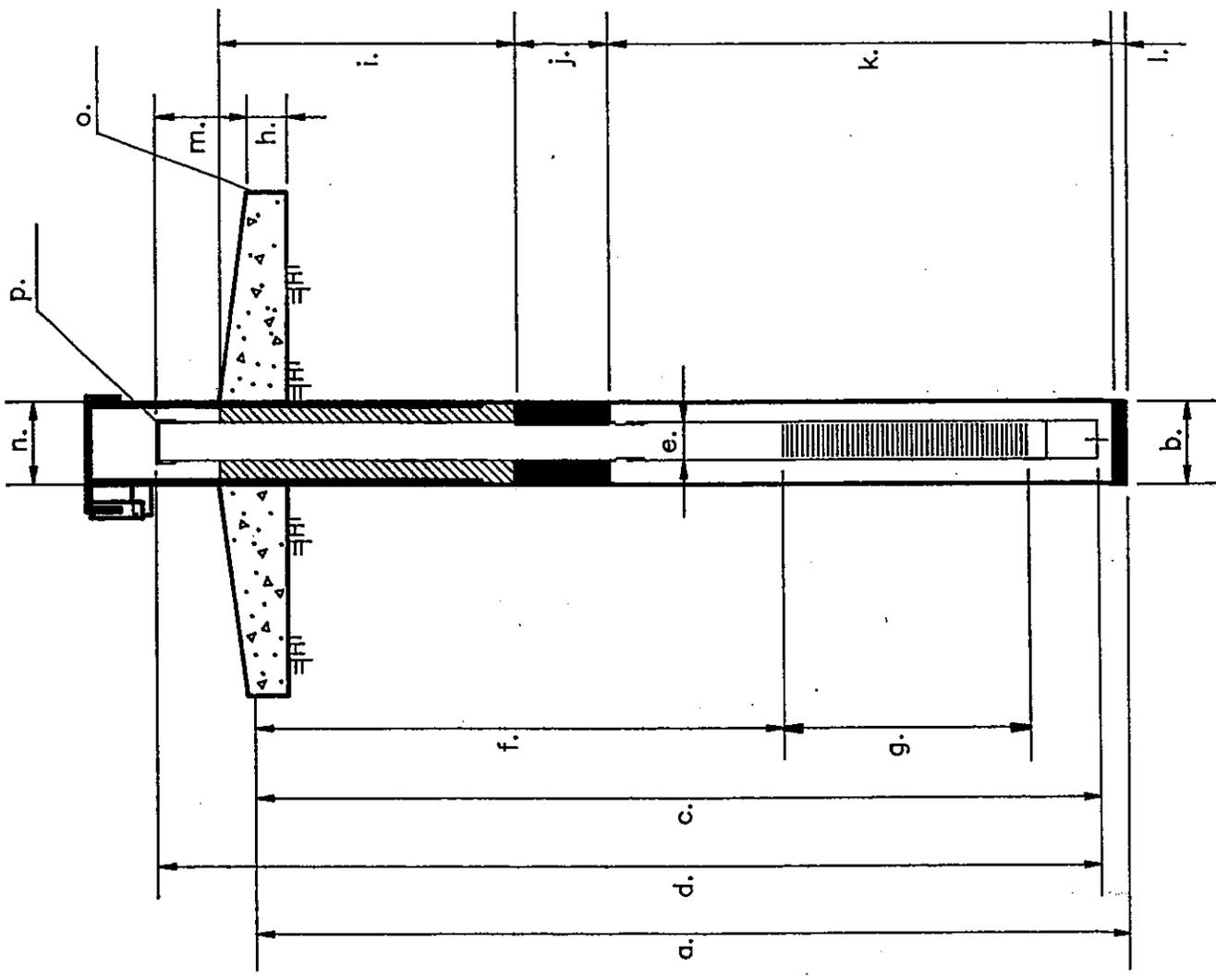
PROJECT: CASPAR LANDFILL JOB NUMBER: 900189.230 91-5 (33-P)
 DATE 12/11/91

EXPLORATORY BORING

- a. TOTAL DEPTH 20 ft.
- b. DIAMETER 8 in.
- DRILLING METHOD CME 750 HOLLOW STEM AUGER

WELL CONSTRUCTION

- c. TOTAL WELL DEPTH 19 ft.
- d. CASING LENGTH 20 ft.
MATERIAL SCH. 40, PVC
- e. DIAMETER 2 in.
- f. DEPTH TO TOP OF PERFORATIONS 9.25 ft.
- g. PERFORATED LENGTH 9.5 ft.
- PERFORATED INTERVAL FROM 9.25 to 18.75 ft.
- PERFORATION TYPE FACTORY SLOTTED
- PERFORATION SIZE 0.020 inch
- h. SURFACE SEAL 0-0.5 ft.
SEAL MATERIAL CONCRETE
- i. BACKFILL 0.5-3.5 ft.
BACKFILL MATERIAL NEAT CEMENT
- j. SEAL 3.5-4.5 ft.
SEAL MATERIAL BENTONITE PELLETS
- k. FILTER PACK 4.5-20 ft.
PACK MATERIAL #3 SAND
- l. BOTTOM SEAL - ft.
- SEAL MATERIAL -
- m. PVC CASING STICK UP 1.04 ft.
- n. PROTECTIVE CASING DIAMETER 8 in.
- o. GROUND ELEVATION 364.50 ft.
- p. TOC ELEVATION 365.54 ft.



RECORD OF
 PIEZOMETER CONSTRUCTION

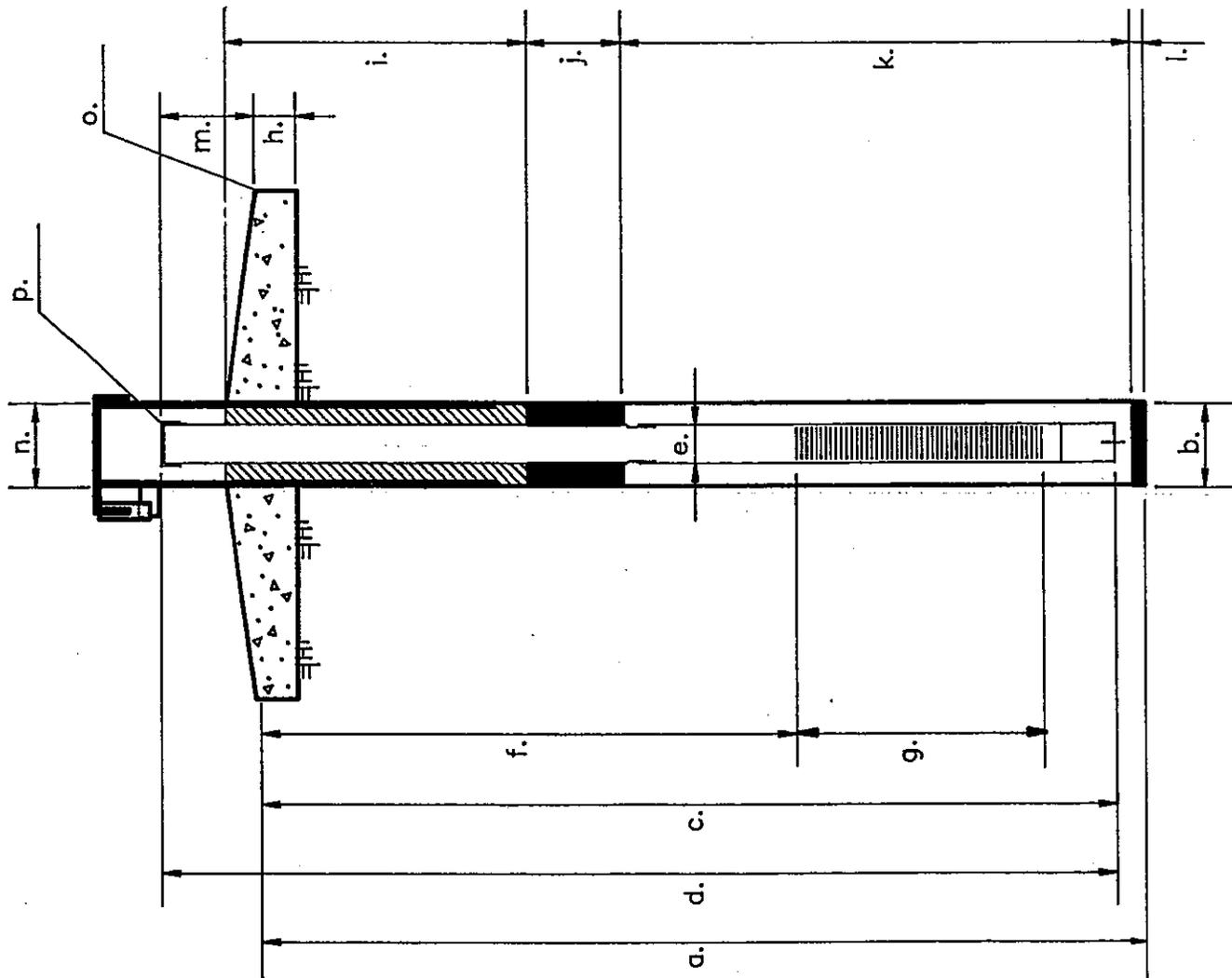


EXPLORATORY BORING

- a. TOTAL DEPTH 20 ft.
- b. DIAMETER 8 in.
- DRILLING METHOD CME 750 HOLLOW STEM AUGER

WELL CONSTRUCTION

- c. TOTAL WELL DEPTH 19 ft
- d. CASING LENGTH 20 ft
- MATERIAL SCH. 40, PVC
- e. DIAMETER 2 in
- f. DEPTH TO TOP OF PERFORATIONS 9.25 ft.
- g. PERFORATED LENGTH 9.5 ft.
- PERFORATED INTERVAL FROM 9.25 to 18.75 ft.
- PERFORATION TYPE FACTORY SLOTTED
- PERFORATION SIZE 0.020 inch
- h. SURFACE SEAL 0-1.0 ft.
- SEAL MATERIAL CONCRETE
- i. BACKFILL 1.0-2.5 ft.
- BACKFILL MATERIAL NEAT CEMENT
- j. SEAL 2.5-3.5 ft
- SEAL MATERIAL BENTONITE PELLETS
- k. FILTER PACK 3.5-20 ft
- PACK MATERIAL #3 SAND
- l. BOTTOM SEAL - ft
- SEAL MATERIAL -
- m. PVC CASING STICK UP 0.09 ft
- n. PROTECTIVE CASING DIAMETER 8 in
- o. GROUND ELEVATION 362.70 ft
- p. TOC ELEVATION 362.79 ft



RECORD OF
 PIEZOMETER CONSTRUCTION

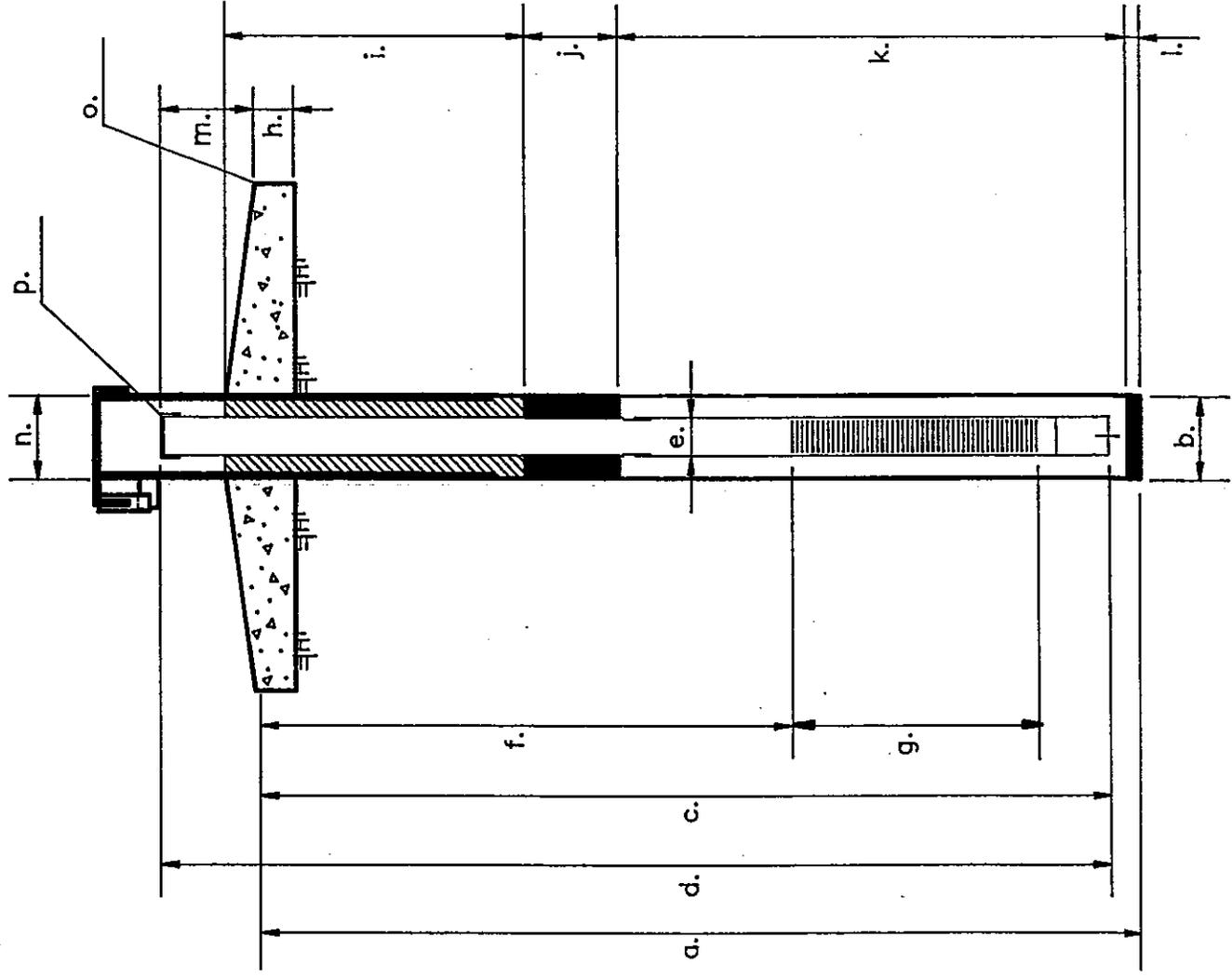


EXPLORATORY BORING

a. TOTAL DEPTH 20 ft.
 b. DIAMETER 8 in.
 DRILLING METHOD CME 750 HOLLOW STEM AUGER

WELL CONSTRUCTION

c. TOTAL WELL DEPTH 19 ft.
 d. CASING LENGTH 20 ft.
 MATERIAL SCH. 40, PVC
 e. DIAMETER 2 in.
 f. DEPTH TO TOP OF PERFORATIONS 9.25 ft.
 g. PERFORATED LENGTH 9.5 ft.
 PERFORATED INTERVAL FROM 9.25 to 18.75 ft.
 PERFORATION TYPE FACTORY SLOTTED
 PERFORATION SIZE 0.020 inch
 h. SURFACE SEAL 0-1.0 ft.
 SEAL MATERIAL CONCRETE
 i. BACKFILL 1.0-2.5 ft.
 BACKFILL MATERIAL NEAT CEMENT
 j. SEAL 2.5-3.5 ft.
 SEAL MATERIAL BENTONITE PELLETS
 k. FILTER PACK 3.5-20 ft.
 PACK MATERIAL #3 SAND
 l. BOTTOM SEAL - ft.
 SEAL MATERIAL -
 m. PVC CASING STICK UP 1.71 ft.
 n. PROTECTIVE CASING DIAMETER 8 in.
 o. GROUND ELEVATION 372.30 ft.
 p. TOC ELEVATION 374.01 ft.

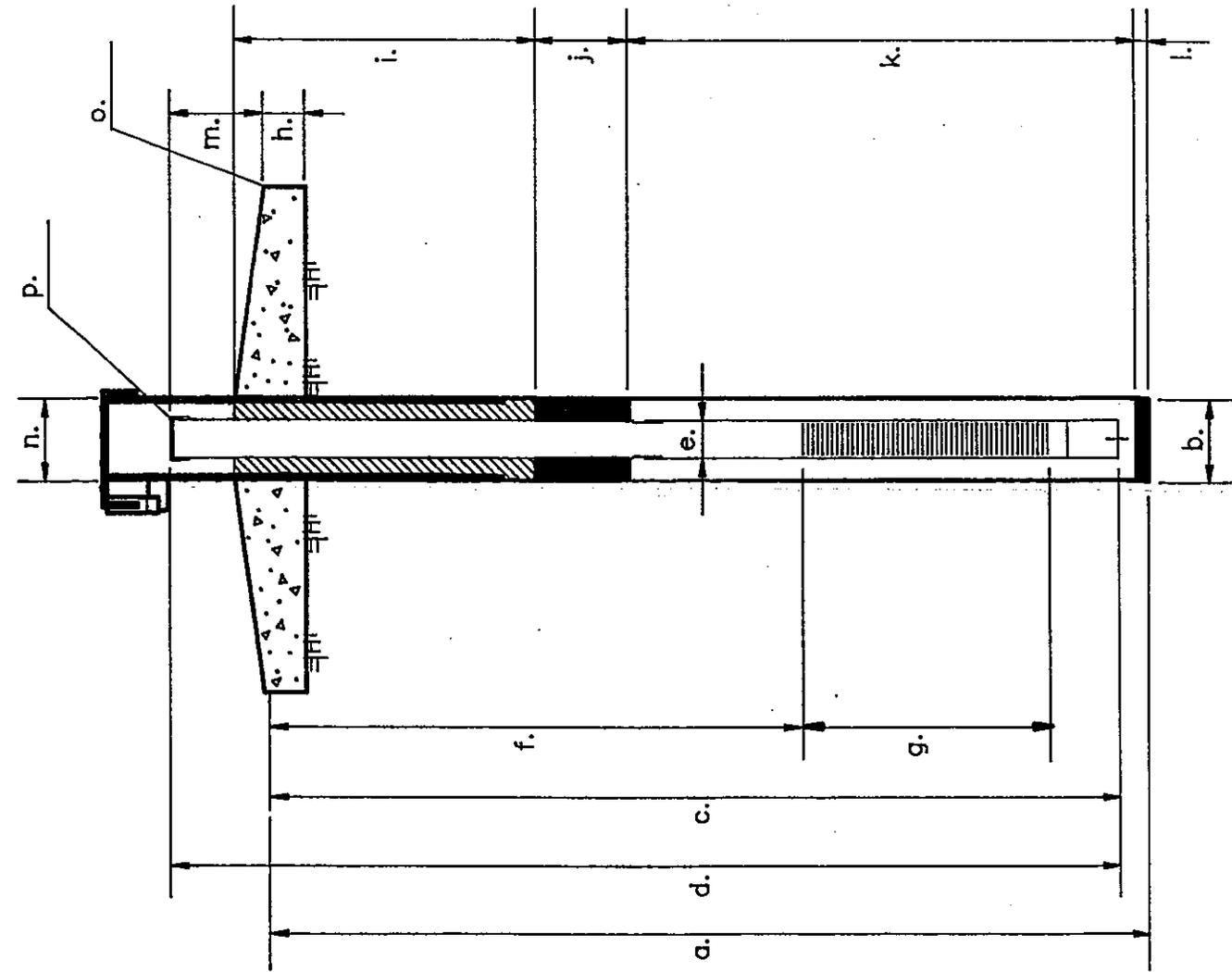


EXPLORATORY BORING

- a. TOTAL DEPTH 20 ft.
- b. DIAMETER 8 in.
- DRILLING METHOD CME 750 HOLLOW STEM AUGER

WELL CONSTRUCTION

- c. TOTAL WELL DEPTH 19 ft.
- d. CASING LENGTH 20 ft.
- MATERIAL SCH. 40, PVC
- e. DIAMETER 2 in.
- f. DEPTH TO TOP OF PERFORATIONS 9.25 ft.
- PERFORATED LENGTH 9.5 ft.
- PERFORATED INTERVAL FROM 9.25 to 18.75 ft.
- PERFORATION TYPE FACTORY SLOTTED
- PERFORATION SIZE 0.020 inch
- h. SURFACE SEAL 0-1.0 ft.
- SEAL MATERIAL CONCRETE
- i. BACKFILL 1.0-2.7 ft.
- BACKFILL MATERIAL NEAT CEMENT
- j. SEAL 2.7-3.7 ft.
- SEAL MATERIAL BENTONITE PELLETS
- k. FILTER PACK 3.7-20 ft.
- PACK MATERIAL #3 SAND
- l. BOTTOM SEAL - ft.
- SEAL MATERIAL -
- m. PVC CASING STICK UP 1.58 ft.
- n. PROTECTIVE CASING DIAMETER 8 in.
- o. GROUND ELEVATION 367.00 ft.
- p. TOC ELEVATION 368.58 ft.



RECORD OF
PIEZOMETER CONSTRUCTION

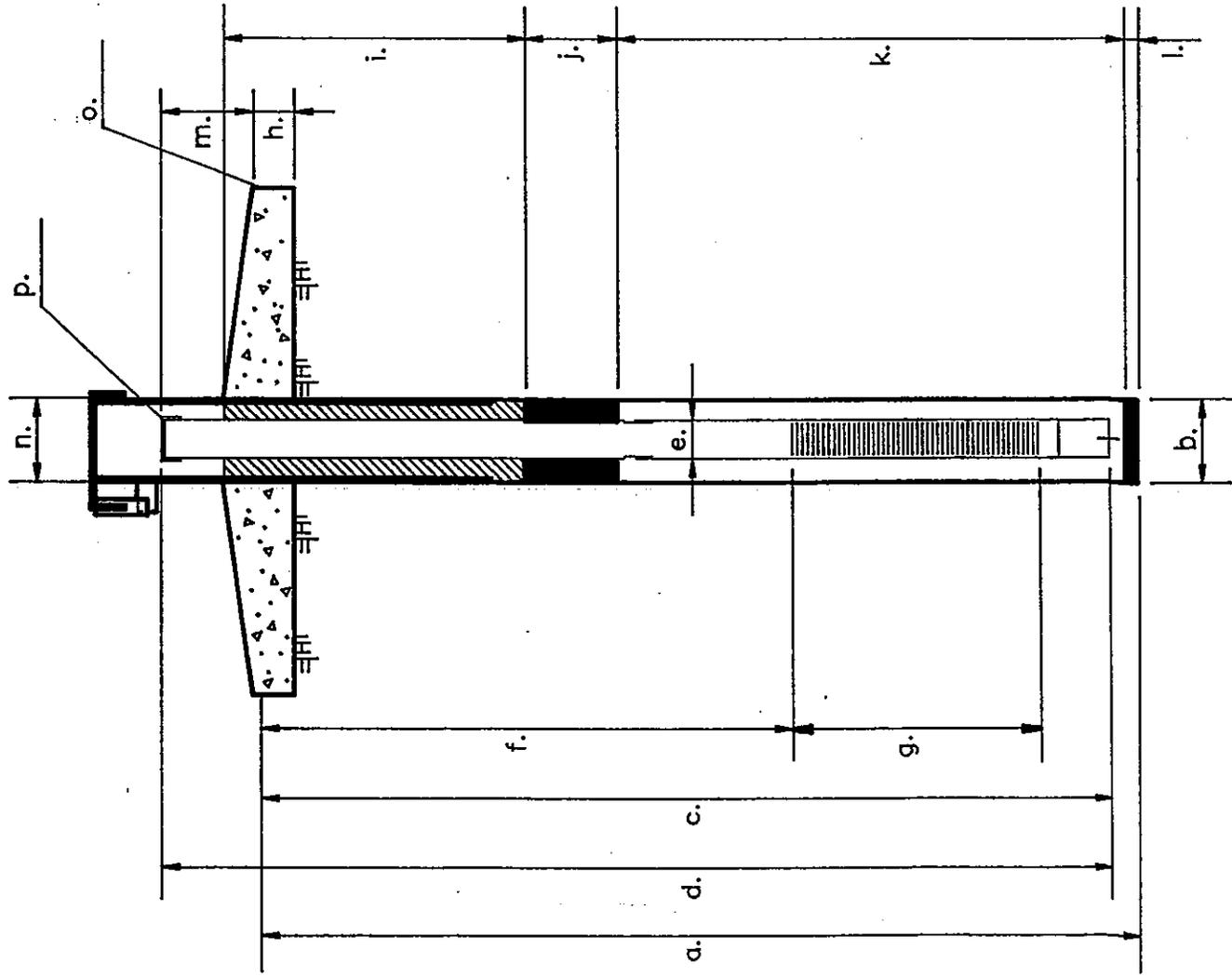


EXPLORATORY BORING

- a. TOTAL DEPTH 20 ft.
- b. DIAMETER 8 in.
- DRILLING METHOD CME 750 HOLLOW STEM AUGER

WELL CONSTRUCTION

- c. TOTAL WELL DEPTH 19 ft.
- d. CASING LENGTH 20 ft.
- MATERIAL SCH. 40, PVC
- e. DIAMETER 2 in.
- f. DEPTH TO TOP OF PERFORATIONS 9.25 ft.
- g. PERFORATED LENGTH 9.5 ft.
- PERFORATED INTERVAL FROM 9.25 to 18.75 ft.
- PERFORATION TYPE FACTORY SLOTTED
- PERFORATION SIZE 0.020 inch
- h. SURFACE SEAL 0-1.0 ft.
- SEAL MATERIAL CONCRETE
- i. BACKFILL 1.0-3.0 ft.
- BACKFILL MATERIAL NEAT CEMENT
- SEAL 3.0-4.0 ft.
- SEAL MATERIAL BENTONITE PELLETS
- k. FILTER PACK 4.0-20 ft.
- PACK MATERIAL #3 SAND
- l. BOTTOM SEAL - ft.
- SEAL MATERIAL -
- m. PVC CASING STICK UP 0.16 ft.
- n. PROTECTIVE CASING DIAMETER 8 in.
- o. GROUND ELEVATION 400.80 ft.
- p. TOC ELEVATION 400.96 ft.



RECORD OF
 PIEZOMETER CONSTRUCTION

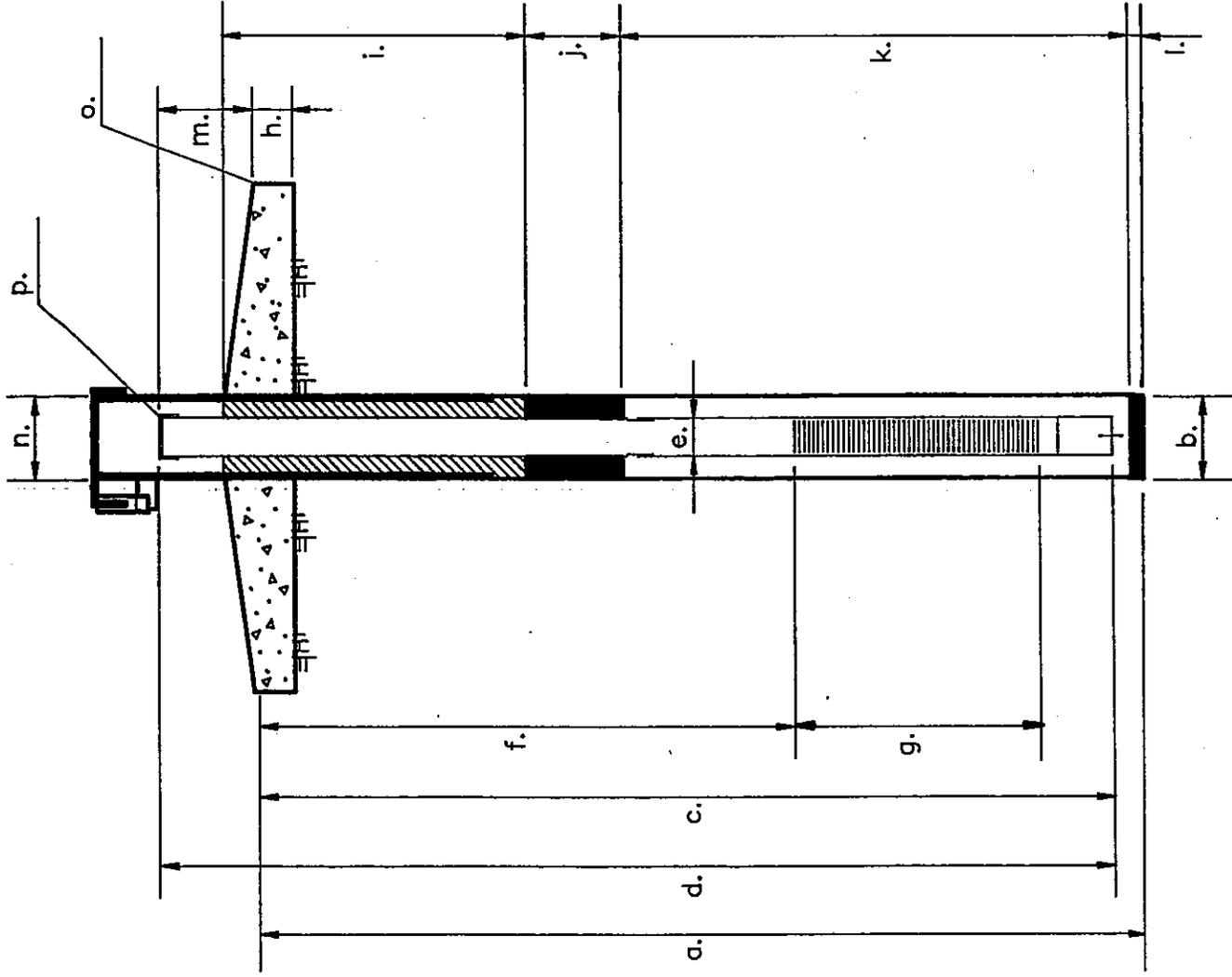


EXPLORATORY BORING

- a. TOTAL DEPTH 20 ft
- b. DIAMETER 8 in
- DRILLING METHOD CME 750 HOLLOW STEM AUGER

WELL CONSTRUCTION

- c. TOTAL WELL DEPTH 19 ft
- d. CASING LENGTH 20 ft
- MATERIAL SCH. 40, PVC
- e. DIAMETER 2 in
- f. DEPTH TO TOP OF PERFORATIONS 9.25 ft
- g. PERFORATED LENGTH 9.5 ft
- PERFORATED INTERVAL FROM 9.25 to 18.75 ft
- PERFORATION TYPE FACTORY SLOTTED
- PERFORATION SIZE 0.020 inch
- h. SURFACE SEAL 0-1.2 ft
- SEAL MATERIAL CONCRETE
- i. BACKFILL 1.2-2.5 ft
- BACKFILL MATERIAL NEAT CEMENT
- j. SEAL 2.5-3.5 ft
- SEAL MATERIAL BENTONITE PELLETS
- k. FILTER PACK 3.5-20 ft
- PACK MATERIAL #3 SAND
- l. BOTTOM SEAL - ft
- SEAL MATERIAL -
- m. PVC CASING STICK UP 1.03 ft
- n. PROTECTIVE CASING DIAMETER 8 in
- o. GROUND ELEVATION 375.30 ft
- p. TOC ELEVATION 376.33 ft



RECORD OF PIEZOMETER CONSTRUCTION



92 SERIES WELLS



PROJECT Caspar Solid Waste Disposal Site
 LOCATION Mendocino County, AP No. 11B-500-11
 GROUND SURFACE ELEVATION _____
 EXCAVATION METHOD CME-95 HSA 8"/12"
 LOGGED BY JLA

JOB NUMBER 900189.230
 DATE DRILLED 8/11/92
 SAMPLER TYPE 5' x 2-1/2" ID Dry Core Barrel
 TOTAL DEPTH OF HOLE 13ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM	
<p>Log from cuttings to 3.5'. Begin running sampler at 3.5'. Make 2.5' runs with sampler to prevent core block.</p> <p>Drill and sample with 8" augers. Ream with 12" augers.</p>	1				SC	SAND, clayey, dry, loose, light yellowish brown. Marine terrace deposits, eolian sand.	<p>Top of Casing Elev: ft.</p> <p>10" Ø lockable steel monument 4" Ø Sch. 40 PVC Type I-II Portland Cement with 5% bentonite concrete mix surface seal bentonite #3 sand PVC cap bentonite</p> <p>8/11/92 8/12/92</p>	
	2				SC	SAND, clayey, slightly moist, dense, yellowish brown. Fine to medium, well rounded. Marine terrace deposits, eolian sand.		
	3				SC	SAND, clayey, slightly moist, very dense, yellowish to reddish brown. Fine to medium, well rounded. Marine terrace deposits, eolian sand.		
	4				SC	SAND, clayey, slightly moist, very dense, white. Well cemented, fine to medium, well rounded. Marine terrace deposits, eolian sand.		
	5		100			SC		SAND, clayey, moist, medium dense, reddish brown. Fine to coarse, well graded, well rounded. Occasional, slightly cemented layers to 1" thick. Marine terrace deposits, littoral sand.
	6					SC		SAND, slightly clayey, very moist to wet, loose, yellowish brown. Medium to coarse, well rounded. Marine terrace deposits, littoral sand.
	7					SC		Becomes wet at 8.6 feet. Color changes to dark reddish brown.
	8		100			SC		
	9					SC		
	10		100			SC		
	11					SC		
	12		100			CL		CLAY, silty, slightly moist, medium stiff, yellowish brown to reddish brown. Occasional Manganese banding to 1/8" thick. Weathered surface of Franciscan Complex.
	13							Bottom of borehole at 13.0 feet.



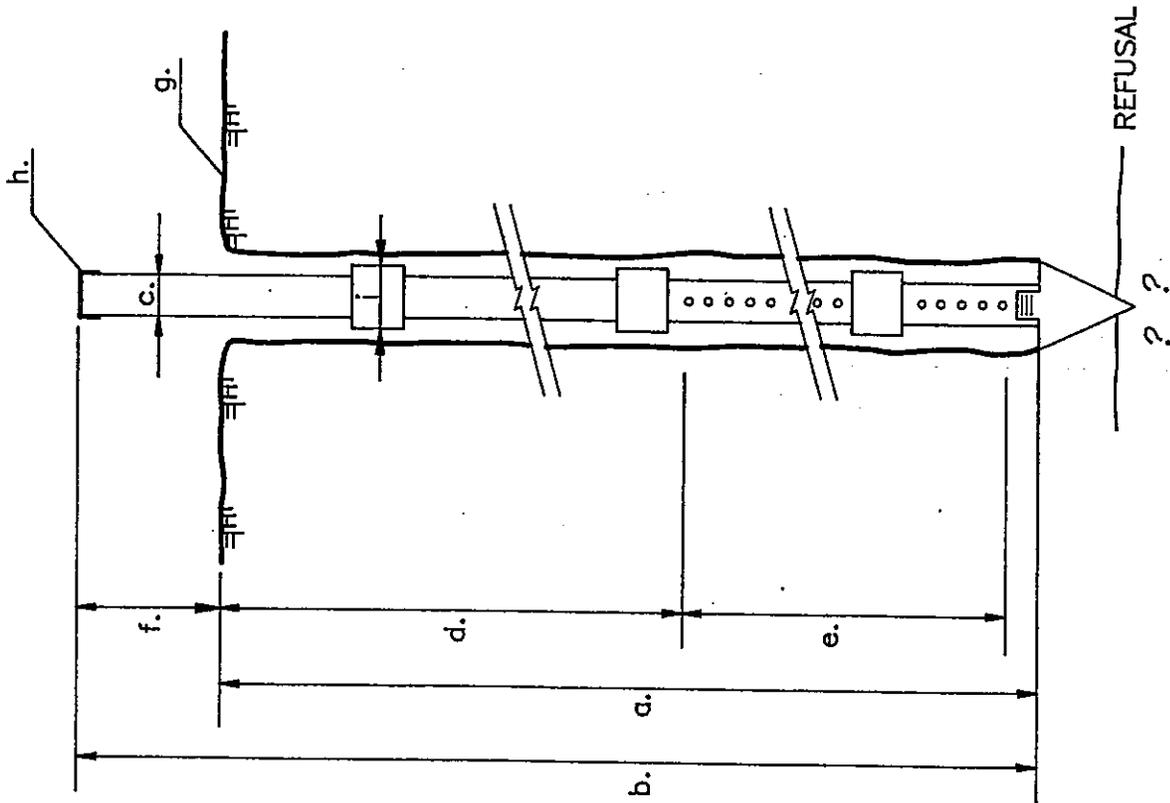
HOLE NUMBER 92-2

PROJECT Caspar Solid Waste Disposal Site
 LOCATION Mendocino County, AP No. 118-500-01
 GROUND SURFACE ELEVATION _____
 EXCAVATION METHOD CME-95 HSA 8"/12"
 LOGGED BY JLA

JOB NUMBER 900189.230
 DATE DRILLED 8/10/92
 SAMPLER TYPE 5'x 2-1/2" ID Dry Core Barrel
 TOTAL DEPTH OF HOLE 11ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.
							WELL DIAGRAM
Log from cuttings to 3.5'. Begin running sampler at 3.5'.	1				SC	SAND, slightly clayey, slightly moist, dense, yellowish brown. Fine to medium, well rounded. Marine terrace deposits, eolian sand.	
	2						
	3						
	4						
Drill and sample with 8" augers. Ream with 12" augers.	4				SC	SAND, clayey, moist, dense, brown. Fine to medium, well rounded. Marine terrace deposits, eolian sand.	
	5	100			SP	SAND, wet, dense, yellowish brown. Medium, poorly graded, well rounded, clean. Occasional, slightly cemented nodules to 1" maximum dimension. Marine terrace deposits, littoral sand. Becomes wet at 4.1 feet.	
	6						
	7						
	8	60					
	9						
	10	50					
11						Bottom of borehole at 11.0 feet.	

LEACHATE PIEZOMETERS
AND
LEACHATE EXTRACTION WELLS



INSTALLATION

PUSHED CASING WITH CME-75C
DRILLING METHOD

PIEZOMETER CONSTRUCTION

- a. TOTAL WELL DEPTH 43.2
- b. CASING LENGTH 45.2
- MATERIAL SCH. 80 STEEL
- c. DIAMETER 2" I.D.
- d. DEPTH TO TOP OF PERFORATIONS 28.2
- e. PERFORATED LENGTH 15
- PERFORATED INTERVAL FROM 28.2 to 43.2
- PERFORATION TYPE DRILL HOLES
- PERFORATION SIZE 3/8" DIA.
- f. PVC CASING STICK UP 2
- g. GROUND ELEVATION 443
- h. TOC ELEVATION ESTIMATED FROM TOPOGRAPHY 445
- i. COUPLINGS 3" O.D.

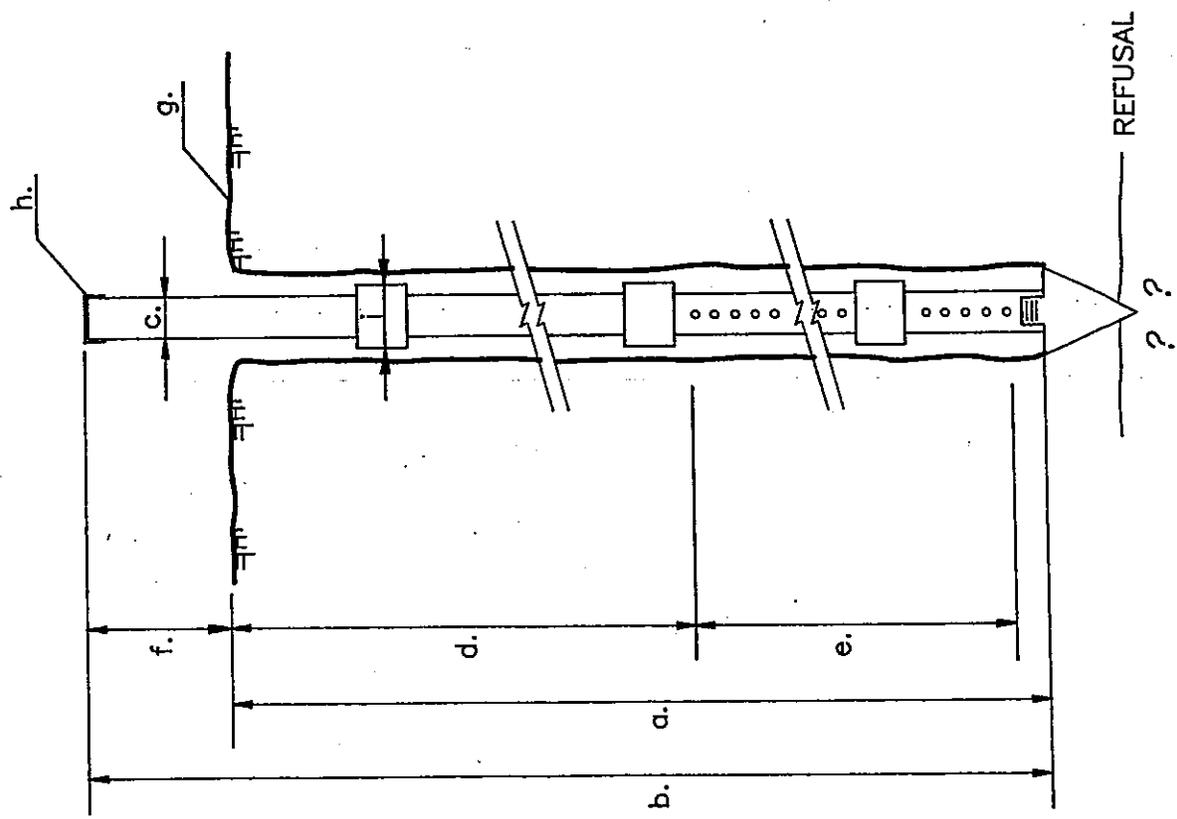
RECORD OF
PIEZOMETER CONSTRUCTION



PROJECT: CASPAR SOLID WASTE DISPOSAL SITE

JOB NUMBER: 920067

L-2-P
DATE 4/30/92



INSTALLATION

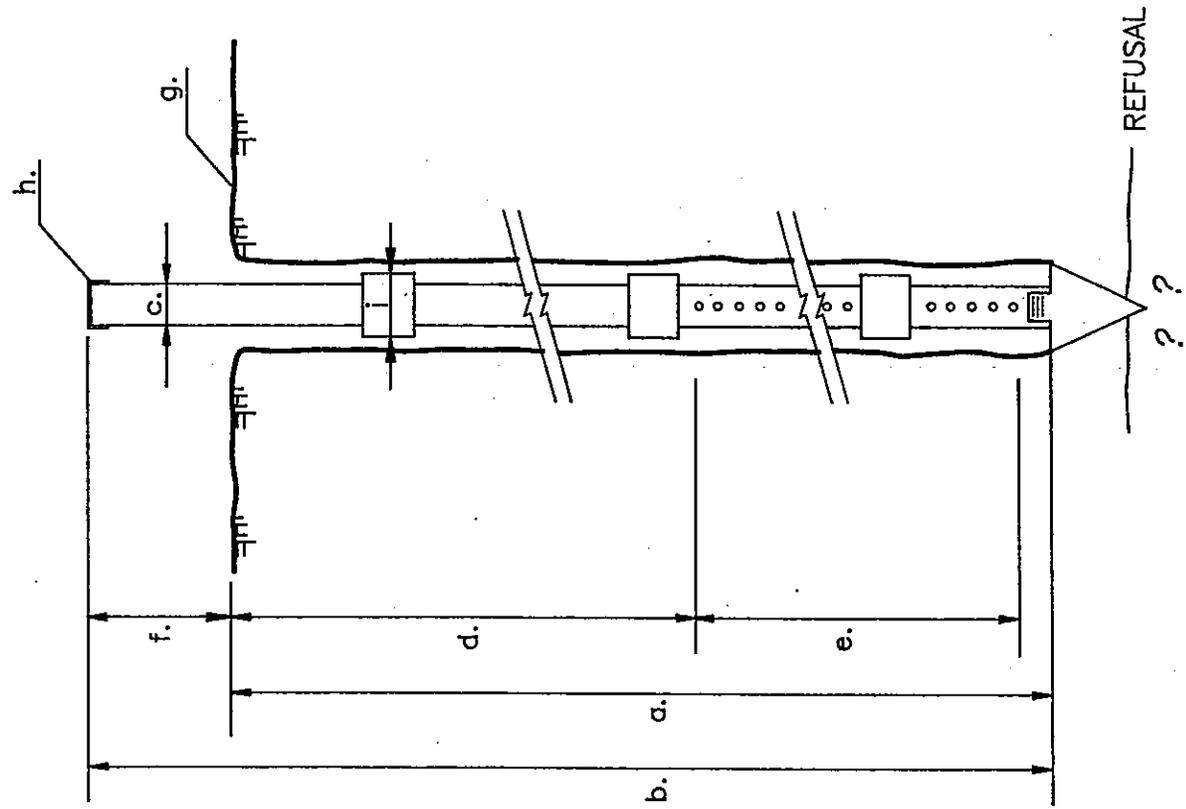
PUSHED CASING WITH CME-750
DRILL RIG
DRILLING METHOD

PIEZOMETER CONSTRUCTION

- a. TOTAL WELL DEPTH 36.0 ft
- b. CASING LENGTH 36.0 ft
- MATERIAL SCH. 80 STEEL
- c. DIAMETER 2" I.D.
- d. DEPTH TO TOP OF PERFORATIONS 21 ft
- e. PERFORATED LENGTH 15 ft
- f. PERFORATED INTERVAL FROM 21 to 36 ft
- PERFORATION TYPE DRILL HOLES
- PERFORATION SIZE 3/8" DIA.
- g. GROUND ELEVATION 0 ft
- h. TOC ELEVATION ESTIMATED FROM TOPOGRAPHY 440 ft
- i. COUPLINGS 3" O.D.

RECORD OF
PIEZOMETER CONSTRUCTION





INSTALLATION

PUSHED CASING WITH CME-75C
DRILLING METHOD DRILL RIG

PIEZOMETER CONSTRUCTION

- a. TOTAL WELL DEPTH 32.4
- b. CASING LENGTH 34.4
- MATERIAL SCH. 80 STEEL
- c. DIAMETER 2" I.D.
- d. DEPTH TO TOP OF PERFORATIONS 12.4
- e. PERFORATED LENGTH 20
- PERFORATED INTERVAL FROM 12.4 to 32.4
- PERFORATION TYPE DRILL HOLES
- PERFORATION SIZE 3/8" DIA.
- f. PVC CASING STICK UP 2
- g. GROUND ELEVATION 431
- h. TOC ELEVATION ESTIMATED FROM TOPOGRAPHY 433
- i. COUPLINGS 3" O.D.

RECORD OF
PIEZOMETER CONSTRUCTION

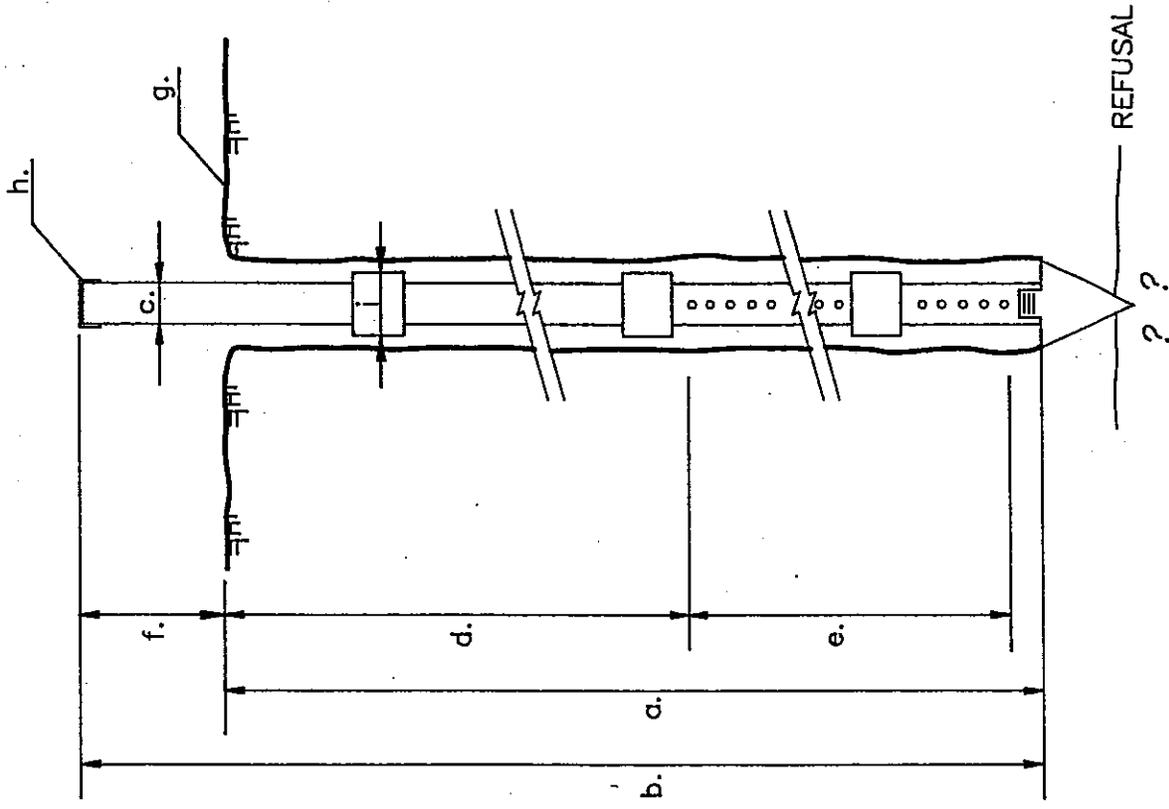


PROJECT: CASPAR SOLID WASTE DISPOSAL SITE

JOB NUMBER: 920067

L-4-P

DATE 4/30/92



INSTALLATION

PUSHED CASING WITH CME--750
DRILL RIG

DRILLING METHOD

PIEZOMETER CONSTRUCTION

- a. TOTAL WELL DEPTH 40.7 ft
- b. CASING LENGTH 43.2 ft
- MATERIAL SCH. 80 STEEL
- c. DIAMETER 2" I.D.
- d. DEPTH TO TOP OF PERFORATIONS 25.7 ft
- e. PERFORATED LENGTH 15 ft
- PERFORATED INTERVAL FROM 25.7 to 41.2 ft
- PERFORATION TYPE DRILL HOLES
- PERFORATION SIZE 3/8" DIA.
- f. PVC CASING STICK UP 2.5 ft
- g. GROUND ELEVATION 431.5 ft
- h. TOC ELEVATION ESTIMATED FROM TOPOGRAPHY 434 ft
- i. COUPLINGS 3" O.D.

RECORD OF
PIEZOMETER CONSTRUCTION

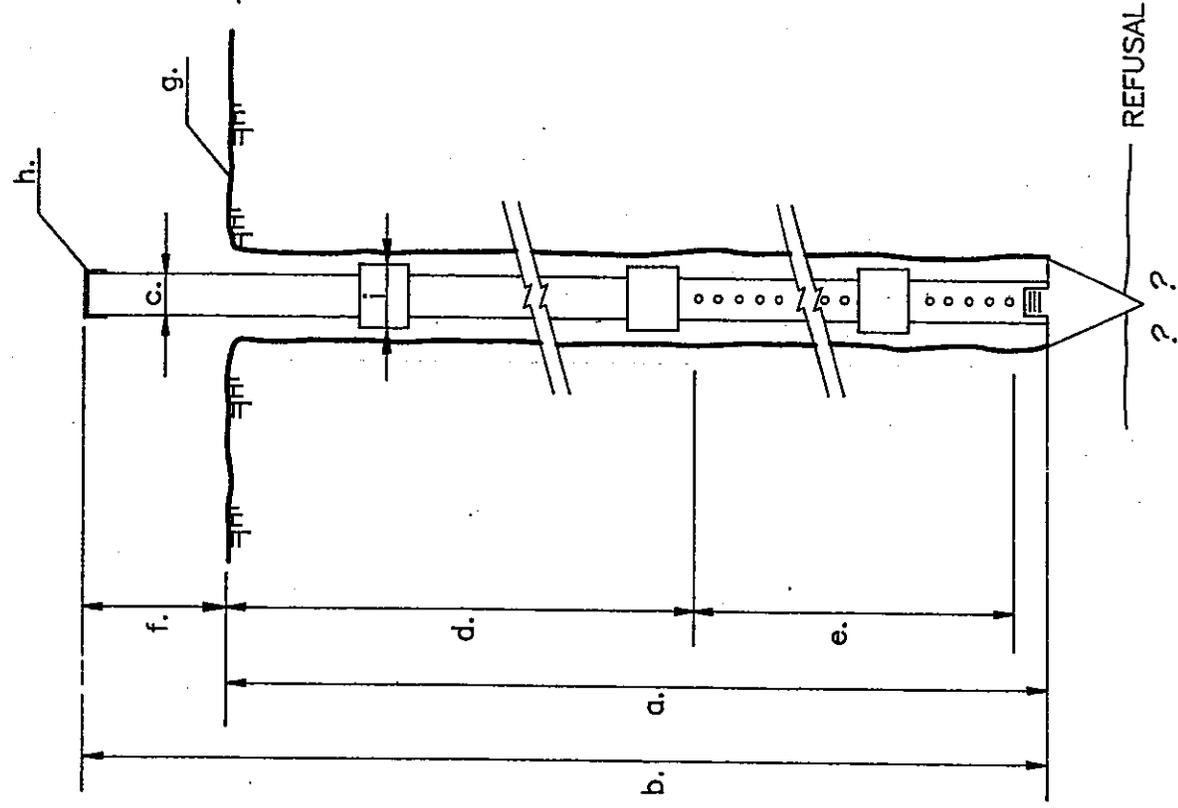


INSTALLATION

PUSHED CASING WITH CME-75C
DRILLING METHOD DRILL RIG

PIEZOMETER CONSTRUCTION

- a. TOTAL WELL DEPTH 38.1
- b. CASING LENGTH 40.6
- c. MATERIAL SCH. 80 STEEL
- d. DIAMETER 2" I.D.
- e. DEPTH TO TOP OF PERFORATIONS 23.1
- f. PERFORATED LENGTH 15
- g. PERFORATED INTERVAL FROM 23.1 to 38.6
- h. PERFORATION TYPE DRILL HOLES
- i. PERFORATION SIZE 3/8" DIA.
- j. PVC CASING STICK UP 2.5
- k. GROUND ELEVATION 447.5
- l. TOC ELEVATION ESTIMATED FROM TOPOGRAPHY 450
- m. COUPLINGS 3" O.D.



RECORD OF
PIEZOMETER CONSTRUCTION





HOLE NUMBER L-7-E

PROJECT Caspar Solid Waste Disposal Site JOB NUMBER 920005
 LOCATION Mendocino County DATE DRILLED 8/14/92
 GROUND SURFACE ELEVATION 438ft.MSL SAMPLER TYPE N/A
 EXCAVATION METHOD CME-95 HSA 8"/12"
 LOGGED BY MAS TOTAL DEPTH OF HOLE 41ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.			
							WELL DIAGRAM			
<p>Drill with 8" augers; ream with 12" augers; then ream with 18" augers. Install well inside 18" augers.</p> <p>Continuously monitored site conditions with Lower Explosive Limit (LEL) meter (for O₂, H₂S, and explosive gases).</p> <p>Level B safety equipment used during drilling and well construction activities at well site.</p>	1					<p>COVER MATERIAL, clayey, light brown.</p> <hr/> <p>REFUSE (municipal waste consisting of paper, plastic, metal, glass, and wood), with occasional soil layers (daily and intermediate cover soils).</p>				
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
	26									
	27									
	28									



HOLE NUMBER L-7-E

PROJECT Caspar Solid Waste Disposal Site JOB NUMBER 920005

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM
	29					REFUSE (municipal waste consisting of paper, plastic, metal, and wood), with occasional soil layers (daily and intermediate cover soils). Leachate at 33.3 feet.	
	30						
	31						
	32						
	33						
	34						
	35						
	36						
	37						
	38						
	39						
	40						
	41						
	42					Bottom of borehole at 41.0 feet. Bottom of well at 40.0 feet.	
	43						
	44						
	45						
	46						
	47						
	48						
	49						
	50						
	51						
	52						
	53						
	54						
	55						
	56						
	57						
	58						
	59						
	60						

HOLE NUMBER L-8-E

PROJECT Caspar Solid Waste Disposal Site
 LOCATION Mendocino County
 GROUND SURFACE ELEVATION ≈447.5ft.MSL
 EXCAVATION METHOD CME-95 HSA 8"/12"
 LOGGED BY MAS

JOB NUMBER 920005
 DATE DRILLED 8/12/92 - 8/13/92
 SAMPLER TYPE California Modified Split Spoon
Sampler 2' long x 2" diameter
 TOTAL DEPTH OF HOLE 51ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.
							WELL DIAGRAM
Drill with 8" augers; ream with 12" augers; then ream with 18" augers. Install well inside 18" augers.	1			[Cross-hatched pattern]		COVER MATERIAL, clayey, light brown.	<p>lockable steel cap well seal cap 8" Ø mild steel casing 8" Ø mild steel, wire wrapped, 0.050" screen 100% crushed road rock bentonite pellets</p>
	2						
Continuously monitored site conditions with Lower Explosive Limit (LEL) meter (for O ₂ , H ₂ S, and explosive gases). Level B safety equipment used during drilling and well construction activities at well site.	3			[Vertical line with 'W' marks]		REFUSE (municipal waste consisting of paper, plastic, glass, metal, and wood), with occasional soil layers (daily and intermediate cover soils).	
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						

PROJECT Caspar Solid Waste Disposal Site

JOB NUMBER 920005

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM
	29					REFUSE (municipal waste consisting of paper, plastic, metal, and wood), with occasional soil layers (daily and intermediate cover soils).	<p>8" Ø mild steel, wire wrapped, 0.050" screen</p> <p>100% crushed road rock</p> <p>steel bottom plate</p>
	30						
	31						
	32						
	33						
	34						
	35						
	36						
	37						
	38						
	39						
	40						
	41						
	42						
	43						
	44						
	45						
	46						
	47						
	48						
	49						
	50			SC		SAND, clayey, very dense, damp, mottled yellowish brown to reddish brown. Fine to medium grained sand. Moderately plastic fines.	
	51					Bottom of borehole at 51.0 feet. Bottom of well at 50.0 feet. No leachate encountered during drilling.	
	52						
	53						
	54						
	55						
	56						
	57						
	58						
	59						
	60						

APPENDIX C
EMERGENCY RESPONSE PLAN

EMERGENCY RESPONSE PLAN

This Emergency Response Plan (ERP) is part of the Final Closure and Postclosure Maintenance Plans (Plans) for the Caspar Refuse Disposal Site (Landfill) in Mendocino County. A copy of the ERP and the Plans will be available at the following address during the postclosure maintenance period for the Landfill:

Mendocino County
Department of Transportation
340 Lake Mendocino Drive
Ukiah, California 95482

The ERP identifies events which may endanger public health or the environment and provides corrective actions to minimize these potential emergencies. Such events include vandalism, fires, explosions, earthquakes, floods, the collapse/failure of slopes, surface water problems, and other waste product releases. Identification and mitigation to potential surface water problems have been identified in Section 2.4 and 2.5 of the Revised Postclosure Maintenance Plan (Revised PCMP) (TRC, 2015).

The ERP will be amended if any of the following occurs:

- A failure or release occurs for which the ERP did not provide an appropriate response;
- The postclosure land use and/or structures on the site change and these changes are not addressed in the ERP;
- The LEA or CalRecycle notifies the operator that the ERP requires modification.

The County will forward the amended ERP to the LEA and CalRecycle

Emergency Response Corrective Actions

Routine inspection and required maintenance procedures for the final cover, associated drainage systems, and the groundwater and gas monitoring systems are provided in the Revised PCMP. Potential emergencies not anticipated during routine monitoring of the closed Landfill and the associated corrective actions are presented below. In the event of an emergency, the following should be notified:

Mr. Geoffrey Brunet, P.E.
County of Mendocino
Department of Transportation
Land Improvement
340 Lake Mendocino Drive
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(707) 463-4566
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Vandalism

Vandalism which may cause an emergency response includes vandalism to the environmental systems which causes these systems inoperable, vandalism to the final cover, and vandalism to the site security system. Upon notice of such events, the damage and potential adverse impacts will be immediately evaluated. If it is determined that the event adversely impacts the site integrity, corrective actions will take place within two weeks



(weather and conditions permitting). The corrective actions will include repairing damaged parts to the original design provided in the Construction Documents and Specifications

Fires/Explosions

In the event of a fire and/or explosion, the situation will be immediately inspected and evaluated for potential safety hazards. If the event is determined hazardous, the area will be immediately secured. The appropriate County officials and regulatory agencies will be immediately notified. Once the hazard is adequately mitigated, the damage to the final cover, drainage facilities, and environmental monitoring systems will be evaluated and temporary corrective actions will be immediately arranged. Repair and restoration of the damaged areas/systems will be conducted within two weeks (weather and conditions permitting) to the original design provided in the Construction Documents and Specifications.

Earthquakes

In the event of an earthquake which may cause an environmental hazard, slope failure or damage to the final cover and drainage facilities, the County will immediately visually inspect the site and evaluate the damage. If the event causes a potentially hazardous situation, the area will be immediately secured. The appropriate County officials and regulatory agencies will be immediately notified.

Once the hazard is adequately mitigated, the County will contact a geotechnical engineer and/or design engineer of the closure of the Landfill to evaluate apparent failures to the final cover and/or slope failures. The geotechnical engineer/design engineer will evaluate the extent of the damage and develop a corrective action plan for the damaged areas. Mitigation of the damaged areas will commence within two weeks, under the direction of the geotechnical engineer/design engineer.

Damage to the final cover and drainage facilities (other than that requiring an evaluation by the geotechnical engineer/design engineer), and potential damage to the environmental monitoring systems will be evaluated and temporary corrective actions will be immediately arranged. Repair and restoration of the damaged areas/systems will be conducted within two weeks (weather and conditions permitting) to the original design provided in the Construction Documents and Specifications.

Floods

Potential flood emergencies include excessive erosion of the surface of the Landfill, and slope failure which may damage the final cover, drainage facilities and/or environmental monitoring systems. In the event of a potentially hazardous flood, the appropriate County personnel and regulatory agencies will be notified.

The County will contact a geotechnical engineer and/or design engineer of the closure of the Landfill to evaluate apparent failures to the final cover and/or slope failures. The geotechnical engineer/design engineer will evaluate the extent of the damage and develop a corrective action plan for the damaged areas. Mitigation of the damaged areas will commence within two weeks, under the direction of the geotechnical engineer/design engineer.

Damage to the final cover and drainage facilities (other than that requiring an evaluation by the geotechnical engineer/design engineer), and potential damage to the environmental monitoring systems will be evaluated and temporary corrective actions will be immediately

arranged. Repair and restoration of the damaged areas/systems will be conducted within two weeks (weather and conditions permitting) to the original design provided in the Construction Documents and Specifications.

Collapse/Failure of Slopes

If the Landfill slopes collapse or fail at any time during the postclosure maintenance period, the County will contact a geotechnical engineer and/or design engineer of the closure of the Landfill to evaluate apparent failures to the final cover and/or slope failures. The geotechnical engineer/design engineer will evaluate the extent of the damage and develop a corrective action plan for the damaged areas. Mitigation of the damaged areas will commence within two weeks, weather and conditions permitting, under the direction of the geotechnical engineer/design engineer.

Other Waste Product Releases

In the event that a waste product release occurs which may cause a health and safety hazard, the County will immediately conduct a visual inspection of the hazard and evaluate the potential adverse effects to the public and/or environment. In the event of a safety hazard, the area will be immediately secured and the appropriate County personnel and regulatory agencies will be notified. If the discharger can be identified, the discharger will be notified to remove the waste. If the discharger cannot be identified, the County will attempt to identify the waste. If the waste is deemed hazardous, a company certified in hazardous waste removal will be contacted to discharge of the waste. If the discharge occurs from within the Landfill, the County will locate the discharge point and immediately implement temporary corrective actions. Complete corrective action will commence within two weeks, weather and conditions permitting.