INDEPENDENT REMEDIAL ACTION PROGRAM REPORT
OROVILLE LANDFILL
OROVILLE-NIGHTHAWK HIGHWAY
OKANOGAN COUNTY, WASHINGTON

AGRA
Earth & Environmental

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SECTION ONE -- REQUIRED INFORMATION

1.0 PROJECT BACKGROUND/SITE DESCRIPTION

The following report summarizes the independent remedial action activities conducted at the subject property which were observed by AGRA Earth & Environmental, Inc. (AEE). The project area, located in the southeast corner of the property, consisted of less than one acre of the landfill property. The remainder of the property was not part of the scope of work. A *Remedial Investigation and Feasibility Study* (RI/FS) report was prepared by Roy F. Weston, Inc. dated July 1993. A substantial portion of the site characterization information within this report was summarized from the aforementioned report. This report does not duplicate any of the previous reports in their entirety that were submitted to the Washington State Department of Ecology (Ecology), but provides pertinent information, as appropriate, in accordance with the draft *Guidance On Preparing Independent Remedial Action Reports*, publication no. 94-18, dated 9 March 1994.

1.0.1 Location

The subject property is located approximately 2.5 miles northwest of Oroville, Washington, on the Oroville-Nighthawk Highway in Okanogan County, Washington within the northeast quarter of section 18, Township 40N, Range 27E. Figure 1-1 in Appendix B depicts the site location and surrounding features. The site is bounded to the east by the highway, and is approximately ¼ mile north of a public golf course. An irrigation canal exists along the western property line of the landfill, while the remaining areas surrounding the project site are owned by the Bureau of Land Management (BLM) and are utilized as range land. The fenced, 16-acre site was the former location of the Oroville Landfill, which was used to dispose of municipal solid waste and other wastestreams from the city of Oroville.

1.0.2 Topography and Geology

The landfill site is situated on a gently to moderately sloping terrace above the Similkameen River at an approximate elevation of 1250 feet, which is approximately 300 feet above the river. The terrace lies on the edge of a narrow, steep-walled canyon through which the Similkameen River flows. Topography slopes gently to steeply to the west, across the former landfill towards the adjacent canyon, with an overall topographic relief of approximately 75 feet. The circular-shaped project area encompassed less than one acre, located in the southeast portion of the property. Topography across the project area sloped gently (14 percent) to the west with approximately 25 feet of relief. West of the canal, regional topography slopes steeply downward to the Similkameen River. Figure 1-2 in Appendix B shows the approximate locations of the property boundaries, the project area, site topography and other pertinent site features. The figures shown within Appendix B were taken from the Weston RI/FS report.

Three drainage features exist on the property which were identified as the "western drainage", the "eastern drainage," and the "erosional feature," in the Weston RI/FS report. A portion of the eastern drainage feature was filled in with refuse during operation of the landfill, later to be discovered by geophysical methods during the site investigation phase of work. The rerouted eastern drainage was subsequently improved to transmit drainage from off site, while minimizing erosion. The erosional feature is located on the southern end of the site, near the location of the newly constructed landfill cap.

A detailed description of the site and regional geology can be found within the Weston RI/FS report. Figure 3-3 within Appendix B shows the mapped rock units within the project. Figure 3-4 shows the approximate distribution of the rock outcrops along with the location of the geologic cross-sections which are also included within Appendix B as Figures 3-5, 3-6, and 3-7. A brief summary of the local geology is provided below.

Lithologic units within the region are primarily classified as low-grade metamorphosed sedimentary rocks dating from the late Paleozoic to the early Cenozoic. The protoliths were initially deposited within a eugeosyncline which extended for approximately 500 miles to the north which was then complexly deformed during various tectonic events, intruded by Jurassic to Cretaceous plutonic rocks and concurrently metamorphosed. Within the Tertiary, sedimentary rocks were deposited over the metamorphic units. Glaciation in the Pleistocene significantly altered the topography of the region, along with deposition of the relatively unconsolidated surficial deposits existing today. Within the subject property limestone and shale are the only mapped sedimentary rock types. The metamorphic rock units found within the landfill property include: phyllite, talc schist, metashale, talc-chlorite schist, metasiltstone, metagreenstone. Igneous intrusive units also found on the property includes dacite and tuffaceous siltstone. Descriptions of the rock units encountered within the deep borings are included within the boring logs in Appendix C.

Surficial deposits at the project site are primarily glacial deposits consisting of glacial till and recessional deposits left by the retreating glacial advance approximately 10,000 to 13,000 years ago. Soils encountered at the surface and within borings within the landfill property, including the project area, generally consisted of medium stiff to stiff, moist, silt, with varying amounts of gravel and sand. The surficial soils were found to mantle either refuse or bedrock, with soil thicknesses varying from 1 to 10 feet. However subsequent grading associated with the landfill has significantly altered the original topography and soil distribution on the site. Areas of fill up to 30 feet thick exist within the eastern drainage area. Detailed descriptions of the soils encountered in borings drilled on the site and adjacent properties for this project are included on the exploration logs in Appendix C.

1.1 RELEASE INFORMATION/SITE CHARACTERIZATION

The City of Oroville operated a municipal landfill at the site from 1967 to 1976 under a Recreation and Public Purposes Act Lease arrangement with the site owners, the Bureau of Land Management (BLM). Municipal solid waste, construction debris, and industrial and agricultural wastes were disposed of at the landfill, but disposal records for these waste streams are not available. The eastern drainage was used as the primary municipal refuse disposal area, although wastes were also placed in the western drainage and the uppermost portion of the erosional feature. Upon completion of landfill operations, a native soil cover was placed over the landfill.

In 1969, the landfill accepted debris generated from demolition of the Chamberlain Agricultural Company warehouse formerly located, in Oroville, Washington. The warehouse had been destroyed by fire. The debris included both demolition waste and pesticides. According to anecdotal information provided by others, bottles of parathion (an organophosphate pesticide) and paraquat (a nitrogen-based herbicide) were apparently buried along with the debris. A trench was excavated near the southeast corner of the landfill area to accommodate the debris, which is shown on Figure 1-2 in Appendix B. The boundaries of the trench were delineated by use of ground-penetrating radar (GPR) which disclosed the trench to be approximately 190 feet long with an average width of 47 feet; and an average depth of 13 feet. The estimated volume of debris is approximately 3,600 cubic yards. Additional GPR survey work and other geophysical surveys over the trench area (performed by Weston and others in 1988 and 1989) indicated the presence of substantial quantities of ferrous debris within the trench at a depth of approximately 8 feet, but did not provide definitive information regarding the possible presence of buried drums.

Based upon site history, the anticipated potential surficial and subsurface contaminants were primarily pesticides and herbicides. Also anticipated were base/neutral/acid (BNA) compounds, volatile organic compounds (VOC), petroleum hydrocarbons, and inorganics. The sampling and analytical testing was performed by Weston across the entire landfill property. Concentrations of the contaminants found within surficial soils in the project area are presented in Table 1.1 below. Groundwater contamination could not be confirmed since no appreciable quantities of groundwater were encountered by the shallow borings. In 1989, the Environmental Protection Agency (EPA) concluded, after reviewing the Oroville Landfill Expanded Site Investigation Report, that the site did not rank high enough for inclusion on the National Priorities List. EPA's letter supporting a finding of no further action (NFA) is included in Appendix A.

TABLE 1.1
ANALYTES DETECTED IN SURFACE SOIL SAMPLES
WITHIN PROPOSED CAP AREA--OCTOBER 1995

Analyte	95-SS-01	95-SS-02	95-SS-03	95-SS-04	95-SS-05	95-SS-06	95-SS-07	95-SS-08	95-SS-09	95-SS-10	95-SS-11	95-SS-12
4,4'-DDE (µg/Kg)	210	82	130	6,600 J	800	4,000 J	1,100 D	6.4 J	400	2,000	1,000	640
4,4'-DDD (µg/Kg)	26 J	8.8 J	40	1,800 J	280 J	1,700 J	68 J	8.1 U	78 J	100 J	480 J	82 J
4,4'-DDT (µg/Kg)	150	88	430 D	17,000	1,200	14,000	720 D	15	180	1,400	3,400	1,100

Note: Risk based cleanup level determined in the RI/FS for 4, 4'-DDT was established at 189 µg/Kg
J = The analyte was positively identified but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than CDRL or lowest calibration standard
D = Diluted
U = The compound was analyzed for, but not detected

1.2 PREVIOUS INVESTIGATIONS

Documentation of site assessment, remediation, and monitoring conducted at the site has been provided to Ecology in the reports listed below:

- Expanded Site Investigation, Oroville Landfill, Okanogan County, Washington
  Roy F. Weston, Inc. and Dames & Moore, Inc., 1989

- Sampling and Analysis Plan, Oroville Landfill, State Remedial Investigation and Feasibility Study
  Roy F. Weston, Inc., 1992

- Remedial Investigation and Feasibility Study Report Oroville Landfill
  Roy F. Weston, Inc. and Dames & Moore, Inc., July 1993

- Proposed Plan/Draft Cleanup Action Plan for the Oroville Landfill, Oroville, Washington
  Roy F. Weston, Inc., 26 July 1995

- Record of Decision, Oroville Landfill, Okanogan County, Washington
  Roy F. Weston, Inc., 1995

- Soil Sampling Report for Proposed Cap Boundary Oroville Landfill
  Roy F. Weston, Inc., 5 January 1996

1.3 SELECTION OF CLEANUP STANDARDS

Cleanup standards used for this independent remedial action were determined in the Weston RI/FS and are documented in the Record of Decision for the site in 1995. These standards were based either on risk to the most sensitive ecological receptor, or on practical quantitation limits (PQLs). The cleanup goals were determined using MTCA Method C for human receptors, and the scientific literature for ecological receptors. Cleanup levels were derived based on risk results obtained from evaluation of the pesticide debris trench hot spot for all chemicals except arsenic. The arsenic cleanup level is based on natural background levels for bedrock-derived colluvial soil. For a specific discussion of the methodologies used for determination of the ecological risk-based cleanup levels, reference the July 1993, RI/FS report.

1.4 EXPLANATION OF REMEDIAL ACTIONS TAKEN AND RATIONALE

The Model Toxics Control Act (WAC 173-340) states that, when choosing cleanup options for a site the following remedial technologies shall be considered in order of descending preference:

1. Reuse or Recycling
2. Destruction or Detoxification
3. Separation or Volume Reduction
4. Immobilization
5. Off-site Disposal
6. Isolation or Containment
7. Institutional Controls and Monitoring

Each of these options was analyzed by Roy F. Weston, Inc., to determine the most feasible alternative for remedial action. The following sections summarizes each of the alternatives considered. A detailed discussion of each remedial technology option considered was prepared by Roy F. Weston, Inc. and presented in their RI/FS report, a copy of which was provided to Ecology.

1.4.1 Reuse and Recycling

Under MTCA, reuse is defined as employing a spent material in an industrial process to make a product, or employing a material as a substitute for a commercial product. Recycling is defined as using, reusing, or reclaiming a material, where reclaiming consists of processing or regenerating a material to recover useable products. The contents of the landfill are a heterogeneous combination of municipal, industrial, and agricultural wastes that have not been sufficiently characterized or quantified to permit consideration of reuse or recycling. Therefore, reuse or recycling was not considered a feasible alternative for remedial actions.

1.4.2 Destruction or Detoxification

The following treatment methods were considered:

- Soil catalyzed reaction;
- Addition of oxidizing agents;
- Ex situ chemical degradation, including ozonation KPEG dechlorination, and hydrolytic terrestrial dissipation;
- Thermal treatment including rotary-kiln incineration and fluidized bed thermal oxidation; and,
- Biodegradation, both in situ and ex situ methods.

Of the above-listed destruction or detoxification treatment methods, thermal treatment by incineration was the only method retained for further consideration since it is considered the best developed available technology (BDAT) for treating many hazardous and dangerous wastes that are subject to land disposal restrictions. The remaining technologies were eliminated based on their inability to treat the various types of contaminants found within the pesticide debris trench, or on the lack of information on the effectiveness of the treatment method.

1.4.3 Separation or Volume Reduction

Separation or volume reduction technologies employ a variety of methods to reduce the toxicity, mobility, or volume of contaminated soil. Physical or chemical methods may be used to remove contaminants from the soil for treatment by other means. Separation and volume reduction technologies differ from the destruction/detoxification technologies in that the contaminants are typically not chemically altered.

Several of the separation processes currently available rely on vaporization to remove contaminants from the soil. These processes, which are most effectively applied to volatile organic compounds (VOCs), include thermal stripping and steam stripping. Because VOCs are not present in the Oroville Landfill in significant concentrations, these vaporization processes are not applicable to remediation of the site.

The methods considered for separation or volume reduction included:

- Excavation;
- In situ soil flushing and ex situ washing;
- Debris washing; and,
- Chemical extraction.

A lack of information concerning the type and nature of the materials within the pesticide debris trench resulted in the elimination of in situ soil flushing, ex situ soil washing, debris washing, and chemical extraction. For these methods to be utilized requires thorough knowledge of the material to which the technologies are to be applied. Extensive bench-scale testing would be necessary to determine the applicability of each technology.

Excavation was retained as a technology needed to support other technologies under consideration. However, the excavation of incompletely characterized, nonhomogeneous sites may lead to frequent delays as potentially hazardous materials are unearthed.

1.4.4 Immobilization

Immobilization techniques attempt to fix contaminants in the soil matrix, thereby reducing their availability for transport in groundwater, surface water, and air.

Several immobilization techniques were reviewed which are listed below:

- Chemical fixation and solidification;
- Vitrification, both in situ and ex situ; and,
- Adsorption.

Similar to the rationale for rejection of the various separation and volume reduction technologies, the lack of characterization of the materials within the debris trench eliminated from consideration all of the above-listed immobilization techniques. The heterogeneity of the debris would limit the effectiveness of these technologies and increase the uncertainty of the results.

1.4.5 On-site or Off-site Disposal

On-site and off-site disposal involves the landfill disposal of materials from the site. These materials could either be left in the existing landfill or transported to a hazardous waste landfill. Uncontaminated materials could be segregated and then routed to a municipal solid waste landfill.

Three options were identified for on-site disposal of materials from the site. The first option considered was to leave the material in place and take no other action. This option constituted the No Action Alternative. The second option considered was to leave the material in place and apply a cap over the entire landfill area or utilize selective capping over the pesticide debris trench to contain the contaminants. Capping is discussed further in Section 1.4.8.1. The third option considered was to excavate the pesticide debris trench material, install a bottom liner, replace the excavated material, and then apply a cap. This option would bring the landfill up to the currently accepted standards for landfill design. However, excavating the pesticide debris trench material would, trigger RCRA landban restrictions. In accordance with these restrictions, hazardous or dangerous waste components of the excavated waste stream could not be replaced in the landfill without treatment using the BDAT mandated by EPA. Treatment using BDAT would require extensive sorting to remove the hazardous and dangerous waste components from the waste stream.

Placement of hazardous and dangerous waste in an on-site RCRA hazardous waste landfill was not considered further, because it would not offer a greater degree of protection of human health or the environment than off-site disposal. The No Action Alternative was retained for comparison with other alternatives developed for the site. Off-site disposal and capping were also options retained for further consideration.

1.4.6 Isolation or Containment

Isolation and containment may include capping, slurry walls, sheetpile cutoff walls, or other subsurface or surface barriers. Subsurface barriers generally consist of low permeability cut-off walls or diversions that are installed below the ground surface to contain, capture, or redirect groundwater flow in the vicinity of a contaminated site. Because of a lack of appreciable groundwater at the site, subsurface barriers were deemed unnecessary. Surface water controls may be used to control runon and runoff, reduce the amount of moisture entering the landfill, and thereby reduce the potential for leachate generation or erosion.

Surface caps can control erosion of contaminated soil by wind and water, reduce the leaching of surface water through the soil of a contaminated site, and prevent people or animals from contacting site contaminants. To improve the effectiveness of the cap, surface water and drainage controls should be implemented in conjunction with the cap. In general, surface capping will reduce the mobility of soil contaminants, but does not reduce their toxicity or volume. Long-term monitoring would also be necessary to ascertain the continuing integrity of the cap. Such monitoring would probably consist of visual inspection, and the collection and analysis of sediment and seep samples in conjunction with groundwater samples from monitoring wells. Capping could be readily implemented at the site and was retained for further consideration, along with drainage controls, monitoring and institutional controls.

1.4.7 Institutional and Monitoring Controls

Institutional controls and monitoring controls were also evaluated in regards to long-term management of hazardous substances at the Oroville Landfill. Institutional controls generally involve land use restrictions and site access restrictions. Land use restrictions will be instituted by BLM to limit future uses to those appropriate to this type of site. The BLM has withdrawn the lands from entry and has classified the property as a hazardous materials site in BLM's permanent land records (Master Title Plats and Historic Index). These measures will ensure that future BLM employees and potential site owners will be fully apprised of the site history should there be any proposed transfer of ownership. Site access restrictions applied to sites are intended to limit contact with contaminated materials by: 1) restriction of public access, and 2) restriction of occupational use. Fences, gates, signs, and alarms or other detection systems are typically used to enforce these restrictions. A cyclone fence with the necessary signage was constructed around the landfill in 1987. Access is limited to BLM employees by means of a locked gate. Monitoring controls involve monitoring of the existing soil, surface water, and groundwater conditions at the site to evaluate if any contaminants are migrating off site. Long-

term monitoring of the site would determine the effectiveness of remedial actions taken. The BLM will institute a 30-year monitoring program at the site. Leachate, seep and groundwater samples will be obtained annually. Groundwater samples will be obtained from the one upgradient and two downgradient monitoring wells as described in the Record of Decision for the Oroville Landfill. Also, every five years, sediment samples would be collected in two gullies below the landfill. All samples would be analyzed for suspected landfill contaminants. The landfill cap system would also be inspected annually for signs of degradation with any needed repairs performed as soon as possible.

All of the institutional and monitoring controls were retained for further consideration. Institutional and monitoring controls used at the site are also discussed in Section 1.5.

1.4.8 Rationale for Remedial Action Taken

Based upon the above discussion, the feasible alternatives for remedial actions were narrowed to the following six options:

- Alternative A — No action
- Alternative B — Institutional controls
- Alternative C — Capping
- Alternative D — Selective capping
- Alternative E — Excavation with on-site incineration and capping
- Alternative F — Excavation with off-site incineration/disposal and capping

Each of these alternatives were developed based on the objectives to protect human health and protection of the environment. A detailed description of each alternative and the evaluation procedures used to determine the six options can be found within the RI/FS report dated July 1993.

Results of the risk assessments indicated that the pesticide debris trench had risks or hazard indices above accepted standards, thus, cleanup actions were required for the debris trench. Under MTCA, cleanup actions must protect human health and the environment, achieve MTCA cleanup standards, comply with applicable state and federal laws, and provide for compliance monitoring. Cleanup actions must also use permanent solutions as much as possible. In addition, cleanup must occur within a reasonable period of time.

1.4.8.1 Determination of Preferred Remedial Action Taken

In order to determine whether an action uses a permanent solution to the maximum possible extent, MTCA identifies seven additional criteria, as follows:

- Whether or not the solution achieves cleanup standards;
- Is further action required at the site;

- Would the solution cause significant action to be required at off-site facilities;
- Long- and short-term effectiveness;
- Overall protection of human health and the environment;
- Ability to achieve permanent reductions in toxicity, mobility, and volume;
- Implementability;
- Cost of remedy compared to degree of protectiveness obtained;
- Degree to which community concerns are addressed.

Based on an evaluation of the six feasible alternatives outlined above which takes into account the nine MTCA criteria, the recommended alternative for the Oroville Landfill was determined by Roy F. Weston, Inc. to be Alternative D — Selective capping with institutional and monitoring controls. The area targeted for capping was the location of the pesticide debris trench and the area immediately west of the trench (for the reasons discussed in Section 1.4.8.2). Alternative D was selected because it optimized the balance between the different evaluation parameters. Alternative D, which incorporates institutional and monitoring controls achieves cleanup standards and complies with the threshold criteria of protecting human health and the environment. By capping the pesticide debris trench the highest risk area was contained. The remaining areas of the landfill were not considered a significant risk to the environment or human health; thus, no further remedial actions are required at the site. Selective capping was viewed as the most implementable and produced the lowest short-term risks of the alternatives meeting the threshold criteria. Hazards associated with excavating and handling toxic compounds were minimized in this alternative. Its long-term effectiveness, and reduction in mobility is comparable to the other alternatives considered. The benefit in reduction in volume and toxicity provided by the on- or off-site incineration and capping alternatives was not determined to be worth the short-term risks associated with excavation of the toxic materials within the pesticide trench. Finally, the selective capping alternative could be performed for a reasonable cost in consideration of the relatively low potential threats associated with the landfill.

1.4.8.2 Determination of Project Limits

The limits of the capped area were delineated by testing of surface soil samples obtained during the RI/FS phase of the project. Soil samples which were found to have contaminant levels below the site specific cleanup levels determined during the RI/FS, defined the outer limits of the cap. However, additional soil sampling was performed by Roy F. Weston, Inc., in October 1995 to confirm the limits of the proposed cap boundary. The sample locations and the test results are included within Appendix D. Based on this testing, it was determined the cap should extend west beyond the originally defined boundaries of the pesticide debris trench. The BLM in May 1996 also performed additional sampling. The testing methodology, sample locations, and test results were summarized in a letter provided us which has been included within Appendix D. The BLM's testing results were in agreement with those from the Roy F. Weston, Inc. study. However, as an added safety factor the cap was extended an additional

25 feet beyond the first samples which were below cleanup levels. The sampling methodology is summarized in Section 1.6, while the sample locations within the project area are shown on the various figures included within Appendix D. Analytical results for samples taken during the RI/FS have been previously submitted.

1.4.8.3 Project Requirements

Construction plans and specifications for the cap construction can be found in BLM's construction contract for the project, available from the BLM. Pertinent sections of the plans are included within Appendix E. Original plans called for a 2-foot-thick layer of low permeable soil to be placed and compacted over the cap area. The low permeability soil could either be naturally occurring or amended to achieve the required permeability. However, due to a lack of a suitable, readily available borrow source, a low permeability soil cap was ruled out. Cost considerations ruled out the use of a bentonite amended soil for capping. The use of a geosynthetic clay liner (GCL) was submitted as an alternative design. The GCL alternative design was found acceptable by the BLM since the GCL had a stated permeability less than or equal to the maximum permeability specified by Ecology for landfill cover systems, and is now considered an appropriate alternative to a compacted low permeability soil liner.

As shown in Table 1.1, contaminant concentrations were above the cleanup levels determined for the site during the RI/FS; therefore, a project specific Health and Safety Plan, dated June 1996 was prepared by AEE. All personnel working within the cap area were required to read, sign and abide by the Health and Safety Plan. During all construction activities a representative of AEE was on site performing the duties of the Site Safety Officer, as detailed within the Health and Safety Plan.

1.4.8.4 Description of Construction Activities

On 5 July 1996 construction activities began on the cover system to cap the pesticide trench and surrounding areas at the Oroville Landfill. Construction of the cap began with flattening of the existing vegetation within the cap area, while taking care to minimize dust as per the Remediation Action Plan, and the Health and Safety Plan. A water truck was used to spray the surface of the cap area and access road to the cap area for dust control. Water application was carefully monitored to prevent runoff or erosion, as detailed within the Remediation Action Plan, the Health and Safety Plan, and the BLM Contract, copies of which are available from the BLM. Excavation of the perimeter drainage collection ditch around the outside edges of the proposed water cap then began. The ditchline was graded such that positive drainage was maintained throughout its length. Soils excavated from the ditch were placed within the cap area, a minimum of 7 feet from the inside edge of the ditch. Soil and investigative derived waste (personal protective equipment (PPE) and drill cuttings) generated during the previous environmental investigations had been stored in twenty-seven, 55-gallon drums on the south end of the site. Following excavation of the drainage ditch, these barrels were transported from the south end of the site to the middle of the proposed cap area and subsequently flattened by

a dozer. In addition, a drum containing PPE and sludge from the leachate collection system, located at the base of the gabion wall within the western drainage channel, was placed in an overpack barrel, transported to, and placed within the center of the cap area and subsequently crushed. The stockpiled ethion contaminated soils were then moved to the cap area and spread out within the central portion of the cap. Ethion-contaminated soil was placed no closer than approximately 15 feet from the edges of the cap, in accordance with the project specifications.

Once the barrels and ethion stockpile had been placed within the center of the cap, clean silty soils were imported onto the site and placed over the cap area. A minimum of two feet of subsoil was placed over the pesticide trench area, crushed barrels and ethion contaminated soils, within the center of the cap area. The silty soils were placed in approximately 6- to 12-inch lifts and compacted to a minimum of 95 percent of the ASTM: D698 Standard Proctor maximum. A total of approximately 1,500 cubic yards of imported silty soil was placed over the cap area. A sample of the silty soils used as the subsoil was obtained for the Standard Proctor analysis and for permeability testing. For the permeability testing, the soil sample was recompacted to approximately the minimum required compaction, and then tested for its hydraulic conductivity (by ASTM; D5084 test method) which was found to be $1x10^{-4}$ cm/sec. Results of density testing as well as details of the daily construction activity can be found within Appendix F. Laboratory test results can be found within Appendix G. The subsoil was graded such that positive drainage was maintained across the entire cap area.

A low permeability geosynthetic clay liner, Bentomat TS, was placed over the subsoil as per the project specifications. Product information indicates the liner has a permeability of $1x10^{-7}$ cm/sec. The liner was installed and adjacent panels were overlapped in a manner consistent with the manufacturer's specifications and recommendations. Details of the liner construction are shown in the as-built drawings within Appendix E. The liner was also overlapped into the drainage ditch which was subsequently backfilled with washed drain rock.

Once the liner was placed, approximately 2,500 cubic yards of clean, imported topsoil was placed over the liner. Continuous monitoring of the spreading of the topsoil was performed to prevent tearing or puncturing of the liner by construction equipment. Large rocks were removed by hand to minimize the possibility of puncturing the liner. The topsoil was graded such that positive drainage was maintained and then compacted by track walking with the construction equipment. Upon completion of the topsoil placement, cow manure was spread over the surface and blended into the topsoil. In November 1996, the cap area was seeded and an erosion control blanket comprised of 70 percent straw and 30 percent coconut fiber, was placed over the cap area to complete the project. The BLM plans to control weed growth on the cap for the next two years to enhance grass establishment. Within Appendix F are copies of the daily field reports which detailed each day's activities.

1.4.8.5 Decontamination Wastewater Collection and Analysis

During the construction process, decontamination of all construction equipment and personnel was required prior to leaving the site. The decontamination process was performed within the existing, lined wash pad with the water collected and stored within a 1,000 gallon storage tank. Approximately 750 gallons of water was generated and collected. Once the project area was capped and the final cleaning of the equipment had been completed, the accumulated decontamination water was sampled and tested. The analytical test results indicated that the sludge within the bottom of the tank was below cleanup levels and thus could be disposed of on site. However, the water within the tank was slightly above cleanup levels. The City of Oroville Wastewater Treatment Facility was contacted to determine if they could accept this decontamination water. The decision was deferred to Ecology. Within a letter dated 16 August 1996, Ecology ruled that the decontamination water could not be discharged to the Oroville Wastewater facility. However, it was recommended within this letter to evaporate the decontamination water within a temporary lined pond. Copies of the analytical results for the sludge and decontamination water, and subsequent correspondences concerning disposal of the water are included within Appendix H.

The decontamination water was subsequently placed within a lined pond and evaporated as recommended. The sludge from the tank bottom was disposed of on site, while the storage tank was triple rinsed, cut up into small pieces and buried in the southeast corner of the project site. The liner from the evaporation pond was also cut up and buried within the southeast corner of the site along with the tank. Due to the low concentrations of contaminants within the decontamination water, analytical testing was not performed on the residue left from the evaporation process.

1.4.9 Request for Ruling of No Further Action

As detailed within the Record of Decision (Roy F. Weston, Inc., 1995), selective capping of the site is the most appropriate remedial action for the Oroville landfill. It is our opinion that the site is now eligible for site closure. The basis for this opinion includes the following:

- The areas identified as being of highest risk to human health and the environment have been capped and thus contained by the low permeability cap;
- Since there is a lack of a continuously saturated groundwater table and the historical annual amount of precipitation is sufficiently low, the risk of leaching by near-surface groundwater is considered remote;
- Surface runoff and runon is being controlled by providing positive drainage across the entire cap, and by a perimeter drainage system, thus minimizing the amount of potential surface water infiltration; and,

- The appropriate institutional and monitoring controls have been implemented to minimize the potential of site disturbance or inadvertent removal of potentially contaminated soils. Long-term monitoring will allow determination of the effectiveness of the remedial actions.

1.5 INSTITUTIONAL CONTROLS

The institutional and monitoring controls mentioned in Section 1.4.7 have been implemented at the site.

Institutional controls which were implemented are as follows:

- The BLM has withdrawn the lands from entry and has classified the property as a hazardous materials site in BLM's permanent land records (Master Title Plats and Historic Index). These measures will ensure that future BLM employees and potential site owners will be fully apprised of the site history should there be any proposed transfer of ownership.

- Site access is restricted by means of a cyclone fence with a locked gate and appropriate signage, which encompasses the entire landfill property. The BLM will continue to maintain the fence and signage.

- Long-term monitoring of the site will be performed by the BLM for 30 years. This monitoring will include inspection of the condition of the site fencing and the landfill cap integrity to determine if any degradation has occurred or if repairs are necessary.

- Leachate, seep and groundwater samples will be taken annually for 30 years. Also, every five years, sediment samples will be collected at established locations in two gullies below the landfill. All samples will be analyzed for suspected landfill contaminants.

1.6 SAMPLING AND ANALYSIS

Sampling methodologies and analysis for the RI/FS phase of work have been previously documented within the RI/FS report prepared by Weston Inc. dated July 1993. Site soil profiles are described on the boring logs found in Appendix C. A brief summary of the local geology was provided in Section 1.0.2 while a more detailed discussion can be found in the Weston RI/FS report. Geologic cross sections of the site have been included within Appendix B. The locations of soil samples collected prior to completion of site remediation are shown on Plate 12 within Appendix B. The locations of soil borings and monitoring well locations are shown on Figure 2.2 within Appendix B. Soil sample locations for delineating the cap boundaries are shown in Appendix D along with the sampling methods, and test results.

Documentation of well installation procedures, well development and purging procedures, and other information concerning the RI/FS phase of work can be found within the aforementioned document, and thus will not be duplicated within this report.

During construction activities surface soil samples were not obtained. However at the end of construction the sludge and decontamination wastewater generated during the construction process were sampled to determine the appropriate disposal methods. Both the wastewater and the sludge were contained on site within a 1,000 gallon plastic storage tank. Samples of the water within the tank were obtained by slowly lowering a polyethylene bailer into the tank to minimize the loss of any volatile organic compounds which may have been present. Water within the bailer was then carefully decanted into the laboratory prepared sample containers. Samples of the sludge from the bottom of the storage tank were obtained by attaching a scoop to the end of a long rod and scraping the bottom of the tank. The slurry of saturated soils obtained was carefully poured into the sample containers with the excess water decanted from the samples. Upon collection, all the samples were placed into a chilled cooler to reduce the potential for loss of analytes due to volatilization or biodegradation. AEE chain of custody procedures were maintained during transportation to the laboratory to document sample integrity.

The samples had the following analytical tests performed; VOC's according to EPA Method 624, PAHs according to EPA Method 625 (BNA analysis), Pesticide/PCBs according to EPA Method 608, RCRA Metals according to EPA Method Series 200 (total inorganics), and TOX according to EPA Method 9020. Analytical results for the sludge and decontamination wastewater samples are included in Appendix H. A list of reports containing analytical data has been included in Section 1.2. Except for the Weston soil sampling report (5 January 1996), which is included in Appendix D herein, copies of the reports listed in Section 1.2 were previously submitted to Ecology.

Residual concentrations of the contaminants found on site have not been reduced. However, the areas which had been previously identified as requiring remedial action, have been capped. By capping these areas the risk to human health and the environment has been significantly reduced.

SECTION TWO — ADDITIONAL INFORMATION

2.1 GROUNDWATER INVESTIGATION

A groundwater investigation was performed to verify the presence or absence of a groundwater zone beneath the landfill for the following purposes: to determine if there is a connection between the potential upper aquifer and bedrock aquifer; to determine the source of the seeps located within the drainages below the landfill; and to determine the nature and extent of any groundwater contamination, if any.

2.1.1 Aquifer Characterization

A total of 11 groundwater monitoring wells were installed at the site. Eight of the monitoring wells are identified as shallow wells designated: 92MW-1, 92MW-2, SB-1 through SB-4, and AGI-1 and AGI-2. Three deep groundwater well were installed on site designated D-1 through D-3. The locations of the wells are shown on Figure 2.2 within Appendix B, while the well construction procedures and boring logs are presented within Appendix C. A summary of historical groundwater testing results and a summary of analytical data for soil samples collected from the monitoring well borings was previously submitted within the RI/FS.

Based upon the information gathered from the wells installed on the project site, the groundwater on the site occurs in two distinct systems. A deep groundwater system was found within the limestones, cherts, shales and siltstones of the Spectacle Formation at depths of 200 to 300 feet below ground surface. The deep aquifer appears to be confined based upon hydraulic heads measured within the well. The confining layer is likely the talc-chlorite schist which mantles the water-bearing formation. A steep groundwater gradient appears to exist towards the Similkameen River. The gradient was determined by measurements from the three deep wells. However, due to the complex geology of the deep aquifer it was not conclusively determined if the wells are all within the same aquifer.

The second groundwater system occurs in the near surface soils. On-site shallow wells were found to contain small amounts of groundwater. However, long-term monitoring of the eight shallow wells on site disclosed the absence of continuously saturated zones within the near surface soils. The shallow groundwater lenses are likely present in isolated perched zones, topographic lows at the alluvium-bedrock interface, and shallow bedrock features. In the immediate vicinity of the site, these groundwater lenses are thin, and laterally discontinuous.

Attempts to obtain groundwater samples from the eight shallow wells were unsuccessful due to a lack of an appreciable amount of water within any one of the wells. However, analytical evidence from the surface seeps collected downgradient from the landfill suggests that the shallow groundwater system within the project site may contain low concentrations of chlorinated pesticides and a few metals. Analytical testing performed upon samples, from the deep aquifer did not detect any chlorinated or organophosphate pesticides. Samples from the deep wells were also tested to determine if the shallow and deep aquifers are hydraulically connected. Results indicated that the two aquifers were not connected. The surface seeps appear to be associated with the shallow groundwater system, based on geochemical and isotope analysis.

2.2 REGULATORY RECORDS/PERMITS

No permits were required for work conducted at the Oroville Landfill.

2.3 HAZARDOUS SUBSTANCE MANAGEMENT AND HANDLING PRACTICES

During the remedial action, no hazardous substances were generated. However, the remedial actions taken addressed three sources of hazardous materials which are detailed subsequently. The remedial actions performed were done so in accordance with the recommended remedial actions presented by Weston in their 1993 RI/FS and the 1995 Record of Decision for the Oroville Landfill, and the BLM contract and specifications for the project.

2.3.1 Hazardous Substance, Identification and Quantities Related to the Remedial Action

As discussed in Section 1.1, in 1969 the Oroville Landfill accepted debris generated from the demolition of an agricultural supply warehouse in Oroville which had been destroyed by fire. Within the RI/FS report, it was indicated the debris was thought to contain bottles of parathion and paraquat. The debris was placed within a trench excavated within the southeast portion of the landfill property. Based upon geophysical surveys conducted by Weston and others in 1988 and 1989 the boundaries of the pesticide debris trench were delineated. The dimensions of the trench were determined to be approximately 190 feet long by an average of 47 feet wide with an average depth of 13 feet. A volume of 3,600 cubic yards of debris was estimated, assuming 2 feet of cover soil, which was found within SB-1. The approximate location of the trench is shown on Figure 1.2 within Appendix B. Additionally, the geophysical studies performed by Weston indicated the widespread presence of ferrous debris at a depth of 8 feet within the trench. However, it could not be conclusively determined if barrels were present within the trench area.

Surface soils above the pesticide debris trench contained elevated levels of base/neutral/acid extractable organic compounds (BNA or semivolatiles), organophosphate pesticides, and highly elevated levels of chlorinated pesticides.

Ethion contaminated soils were generated in 1987 when an excavation for the construction of the gabion wall disturbed a metal drum containing approximately 30 gallons of a dilute emulsion of ethion. The contents of the drum spilled during removal; thus, the surrounding soils were excavated and placed in a stockpile. A small berm was constructed around the stockpile with the ethion contaminated soils placed on two layers of visqueen and covered.

A total of 27 drums of investigation derived waste (PPE and drill cuttings) had been generated during the field work for the RI/FS report. The labeled and sealed barrels had been stored at the south end of the landfill property. One barrel of leachate sludge collected from the first (temporary) leachate collection system had been stored adjacent to the gabion wall on the west side of the site. See Figure 1.2 within Appendix B for the location of the gabion wall.

2.3.2 On-site Treatment, Storage, and Disposal Related to the Independent Remedial Action

In 1987 the first steps were taken to contain the migration of potentially hazardous substances off site. At this time a gabion wall, associated buttress fill; and a leachate collection system

were constructed at the far western side of the landfill property, approximately 600 feet northwest of the pesticide debris trench. It was during the construction of the gabion wall that the partially filled barrel of dilute ethion was disturbed and spilled; thus, generating the stockpile of ethion contaminated soil. Additionally, in 1987 the cyclone fencing was installed around the perimeter of the landfill property; thus, restricting public access to the site. Other site work performed in 1987 included drainage improvements to the eastern and western drainage channels and along the Oroville-Nighthawk Highway.

In July of 1996 the remedial action of selective capping, recommended by Weston in the 1993 RI/FS, and documented in the Record of Decision for the site in 1995, was performed. Prior to capping, the stockpiled ethion contaminated soils and the barrels of investigation derived waste and the barrel of leachate sludge were placed within the center of the cap area. The area surrounding and including the pesticide debris trench was then capped with a layer of silty subsoil, a geosythetic clay liner and topsoil. Details of the construction of the cap are included within Section 1.4.8.4. No hazardous materials were removed from the site. All personnel and equipment was required to be decontaminated before leaving the site.

The decontamination wastewater generated during remedial activities was evaporated as recommended by Ecology, while the remaining sludge within the storage tank was tested and found to be below cleanup levels and thus left on site.

3.0 CLOSURE

Based upon the hazard risk assessment conducted for the RI/FS by Roy F. Weston, Inc., the pesticide debris trench was identified as the area of greatest risk to human health and the environment. Based upon this determination the area was capped with a low permeable cover system, as per the Record of Decision prepared by Weston, 1995. The details of the cap construction are described within Section 1.4.8.4. The remaining areas of the landfill were not included within this scope of work. Since the recommended remedial action determined by Weston, 1995 has been completed at the site, we request that Ecology issue a letter of No Further Action for the site.

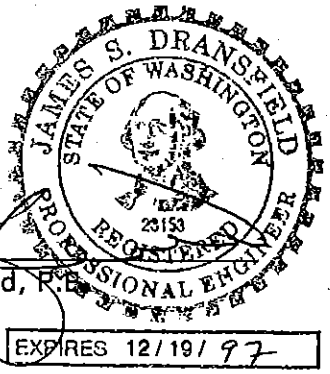
This summary report of independent remedial action activities at the subject property was prepared in accordance with the Washington State Department of Ecology's working draft *Guidance on Preparing Independent Remedial Action Reports*, Publication No. 94-18 and with generally accepted environmental engineering practices. Should you have any questions regarding this report, or other aspects of this project, please do not hesitate to call.

Respectfully submitted,

AGRA Earth & Environmental, Inc.

William J. Lockard
Senior Staff Geologist

Margaret A. Halferty
Senior Project Chemical Engineer



James S. Dransfield, P.E.
Vice President

WJL/MAH/JSD/lad

cc: Goodfellow Brothers, Inc. Attn: Tracy Gregg

APPENDIX A

REQUEST FOR REVIEW
INDEPENDENT REMEDIAL ACTION REPORT
AND
INDEPENDENT REMEDIAL ACTION REPORT SUMMARY

Independent Remedial Action Report Summary

This report summary is an important part of the Independent Remedial Action Report. Please complete the summary and submit it with your Independent Remedial Action Report. If this document does not accompany your cleanup report, or if it is not fully completed, your report cannot enter the review process necessary for Ecology to provide you with a "no further action" determination, or to remove your site from the hazardous sites lists.

FOR ECOLOGY USE ONLY			
ERTS No.	TCP I.D. No.	Date Received	☐ NFA
LUST No.	U.B.I. No.	Initial Investigation (Date)	☐ SHA Referral ☐ Interim Action
Reviewed by		Total Hours for Review	☐ Emergency Action
Does the cleanup comply with cleanup standards? Yes☐ No☐		Total Fee	

Please Print Clearly or Type

General Information

Name of Site Owner Bureau of Land Management			Phone 509-536-1221
Address 1103 North Fancher (Street)	Spokane, WA 99212-1275 (State/Province, Zip)		Spokane (County)
Authorized Contact Joel "Jake" Jakabosky			Phone 509-536-1221
Name of Facility Operator None			Phone
Address (Street)		(State)	(Zip)
Authorized Contact			Phone
Name of Consultant William J. Lockard			Phone 206-820-4669
Name of Firm AGRA Earth & Environmental, Inc.			
Address 11335 N.E. 122nd Way, Suite 100 (Street)	Kirkland, WA (State)		98034 (Zip)

Please indicate which of the above persons completed this report. If the report was completed by someone other than listed above, please provide their name, address, and a daytime phone.

William J. Lockard

Report Information

Has a cleanup been conducted? Yes☒ No☐	Is this a Leaking Underground Storage Tank (LUST) report? Yes☐ No☒
Type of report (check all that apply) ☐ Combined release and independent remedial action report ☒ Independent remedial action report ☐ Interim action report ☐ Final cleanup action report	Date release was reported to Ecology March 1986 Date cleanup was completed November 1996

ECY 020-73 (Rev. 2/94)

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Request for Review
Independent Remedial Action Report

Please submit the following documents to the appropriate Ecology Office *(see back of form)*

- *Request for Review (ECY 020-74)*
- *Independent Remedial Action Report Summary (ECY 020-73)*
- *A check or money order for $1,000, payable to:* **Department of Ecology**
- *An Interim or Final Independent Remedial Action Report*

Ecology's Independent Remedial Action Program provides for the review of Independent Remedial Action reports on a first-come, first-served basis. The Filing Fee paid with this submittal covers an initial review and is not refundable. The initial review will be completed within 90 days.

- If the enclosed remedial action report is **accepted** for detailed review, you will be notified if additional fees are required before detailed review begins (see fee schedule below).
- If the enclosed remedial action report is **incomplete**, you forfeit the $1,000 Filing Fee. The report will be returned with suggestions about what additional information is needed. An additional $1,000 fee will be required if you choose to resubmit.

Note: A copy of this form will be mailed to you. If you wish to inquire about the status of this request for review, please refer to the TCP I.D. number located on the bottom right corner of this form.

- **TOTAL COST OF REMEDIAL ACTION** *(Include both contracted work and work performed by owner/operator)*:

Person/Entity Performing Work	Cost
Bureau of Land Management	$ 260,000
	$
	$
Total Cost of Remedial Action	$ 260,000

Applicant Name:	Bureau of Land Management	Phone (509) 536 - 1221
Applicant Address:	1103 North Fancher Spokane, WA 99212-1275 ATTN: Joel "Jake" Jakabosky	

Site Name: Oroville Landfill

Site Location: Oroville-Nighthawk Hwy, Okanogan County, WA

Site Owner Name *(if different than Applicant)*:

Phone: ( ) -

Site Owner Address:

(Applicant completes above this line, Ecology completes below this line)

FOR ECOLOGY USE ONLY

APPLICABLE REVIEW FEE *(see schedule below)* $

Received	Amount	Date	Received by
Filing Fee	$		
*Fee Balance	$		

*Note: A fee balance may be required. Please keep your receipt for submittal of your fee balance.

FEE SCHEDULE

Cost of Remedial Action	Fee
Filing Fee *(applies to Detailed Review Fee)*	$ 1,000
DETAILED REVIEW FEE	
Minimum Fee:	$ 1,000
$50,000 - $750,000:	2% of Cost
Maximum Fee:	$15,000

173-02-94-005000-5000- ____ (LUST/Non-LUST) – ____ (Office) : $ ____

LUST/Non-LUST Office: ☐ LUST-30 ☐ Non-LUST-20 ☐ NWRO-40 ☐ SWRO-50 ☐ ERO-60 ☐ CRO-70 ☐ IND-80 ☐ SCS-90

Office/Receipt #

ECY 020-74 (2/94)

TCP I.D. # (SIS or LUST): ____

Facility Information

Site Name
Oroville Landfill

Other Names *(the site may be known as)*
None

Site Control Person if other than Owner/Operator. *(This must be a person who is on-site during normal working hours and is authorized and qualified to answer questions about the site, or a person who is available during normal business hours and has knowledge about the site and the remediation.)*

Name Joel "Jake" Jakabosky Phone 509-536-1221

Site Mailing Address *(or site contact mailing address)*
Bureau of Land Management 1103 North Fancher Spokane, WA 99212-1275

Site Location Address *(including zip code)*
Oroville-Nighthawk Hwy Okanogan County, WA 98844

Closest City	County *(where site is located)*
Oroville	Okanogan

Ownership and Operator Type. Complete the table below by checking the appropriate box to identify the type of owner and operator for the facility. (For example, if the property owner is a port district and the operator a private individual, then check the boxes under owner identification column in the municipal, code #2 row, and under the operator identification column in the private party, code #1 row.)

Ownership/Operator Type	Code #	Owner Identification	Operator Identification
Private Party	1		
Municipal (Public)	2		
County	3		
Federal	4	XX	
State	5		
Tribal	6		
Mixed	7		
Other	8		
Unknown	9		
Public Entity Acquisition through Bankruptcy	10		
Financial Institution Acquisition through Bankruptcy	11		

Standard Industrial Classification (SIC) Codes. List all that apply. If none apply, or if you don't know your SIC code, list activities conducted at the site, e.g., automotive repair and maintenance, construction equipment storage,etc.
Former Oroville Landfill

Hazardous Substances Management Practices(s). The hazardous substance(s) cleaned up from the site was the result of which of the following sources, activities, or actions? Please circle all that apply to the facility.

1 = Drug Lab
2 = Drum
3 = A Leaking Impoundment
4 = Improper Handling
(5 = Landfill)
6 = Land Application
7 = Pesticide Application
(8 = Pesticide Disposal)
(9 = A Spill)
10 = Storm Drain
11 = Leaking Tank: (a) below ground; (b) above ground
12 = Unknown

End use of property *(circle one)* COMMERCIAL INDUSTRIAL RESIDENTIAL (VACANT)

Release Information

Date of Release *(if known)*	Date of Discovery	Are there any drinking water systems affected?
18 March 1969	March 1986	Yes ☐ No ☒ Unknown ☐
If drinking water systems are affected, are the systems public, private, or both? *(circle one)*		If drinking water systems are affected, has alternate drinking water been provided? Yes ☐ No ☐ Unknown ☐

General Hazardous Substance Categories. Using the contaminants listed below, complete the table.
(A more detailed description of the contaminants can be found in Appendix C of the guidance.)

Contaminants. For each of the applicable contaminants, enter the appropriate letter designating the status of the contaminants: C = Confirmed or S = Suspended. *(Contaminant status definitions are defined in Appendix C of the guidance.)*		Affected Media				
		Ground Water	Surface Water	Drinking Water	Soil	Air
1.	Halogenated Organic Compounds					
2.	Metals – Priority Pollutants	S*	C		C	S
3.	Metals – Other					
4.	Polychlorinated Bi-Phenyls (PCBs)	S*	C			
5.	Pesticides/Herbicides	S*	C		C	S
6.	Unleaded Gas					
	Leaded Gas					
	Diesel					
	Waste Oil					
	Heat Fuel					
	Other *(Specify)*					
7.	Phenolic Compounds					
8.	Non-Halogenated Solvents					
9.	Dioxins					
10.	Polynuclear Aromatic Hydrocarbons (PAHs)					
11.	Reactive Wastes					
12.	Corrosive Wastes					
13.	Radioactive Wastes					
14.	Conventional Contaminants Organics					
15.	Conventional Contaminants Inorganics					
16.	Base/Neutral Organic Compounds				C	
17.	Asbestos					

Cleanup Information

* NOTE: Shallow groundwater was not encountered within any of the shallow monitoring wells, therefore sampling not possible (see report text)

Indicate cleanup level methods used by completing Table 5-A below. *(check all that apply)*

TABLE 5-A

	Soil	Ground Water	Air	Surface Water
Method A				
B				
C	X	*X	X	X
Have these levels been met throughout the site? *(circle only one)*	YES (NO)	YES (NO)	YES (NO)	YES (NO)

* See NOTE above

Indicate the treatment mehtods used by completing Tables 5B - 5D below *(check all that apply) (See Appendix D)*

TABLE 5-B

	Destruction or Detoxification				Media Transfer		
	Carbon Adsorption[1]	Biological Treatment	Chemical Destruction	Incineration	Air Stripping/ Air Sparging	Aeration/Vapor Extraction	Thermal Desorption
Soil	-NA-				-NA-		
Ground Water				-NA-		-NA-	-NA-
Surface Water				-NA-		-NA-	-NA-
Air		-NA-				-NA-	
Wastes	-NA-				-NA-		-NA-

[1] Carbon followed by regeneration; use of granular activated carbon followed by landfilling would be classified in these tables as volume reduction and off-site landfill

Cleanup Information (continued)

TABLE 5-C

	Immobilization		Reuse/Recycling[2]	Separation/Volume Reduction		
	Vitrification	Solidification/ Stabilization	Specify	Solvent Extraction	Soil Washing	Physical Separation[3]
Soil						
Ground Water	-NA-	-NA-		-NA-	-NA-	
Surface Water	-NA-	-NA-		-NA-	-NA-	
Wastes						

[2]For example, reuse of free petroleum product recovered in a pump and treat system.
[3]For example, oil/water separators.

TABLE 5-D

	Land Disposal/Containment		Institutional Controls	Others
	Containment or On-site Landfill	Off-site Landfill	Specify	Specify treatment method
Soil	X		Access and land use restrictions	
Ground Water		-NA-	Long-term monitoring	
Surface Water	-NA-	-NA-	Long-term monitoring	
Wastes	X			

Lust Site Information

Was free product encountered: on ground water? Yes ☐ No ☐ In excavation? Yes ☐ No ☐

Tank Description			Tank Status (Y or N)		
Tank ID	Product	Size	In Place?	Removed?	Closed in Place?

Environmental Indicators

Answer the following questions as they are applicable to your site:

How many cubic yards of soil have been treated? 3,600 | Where soil treatment was conducted, was it done on-site, off-site, or both? *(circle one)*

Provide the name and address of the facility where soil was treated off-site.
Name _____
Address _____
State/Zip _____

Provide the name and address of the facility where soil was disposed.
Name _____
Address _____
State/Zip _____

How many cubic yards of soil have been disposed of off-site? Ø
(Calculate these quantities of soil while the soil is in place, prior to any excavation and/or treatment.)

If ground water pump and treatment was conducted, how many gallons of ground water have been treated to date? _____ gallons

How many years is the ground water extraction system expected to continue in operation? _____ years

Corrective Actions for Dangerous Waste Facilities

Does the facility have a dangerous waste identification number?	☒ Yes. Specify WA4141190062	☐ No
Is the facility a dangerous waste treatment, sludge, or disposal facility?	☐ Yes	☑ No
If yes, check appropriate regulatory status box	☐ RCRA interim status	
	☐ RCRA operating permit	
	☐ RCRA post closure permit	
	☐ Other, specify	

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION IO

WASHINGTON OPERATIONS OFFICE
c/o WASHINGTON DEPARTMENT OF ECOLOGY, PV-11
OLYMPIA, WASHINGTON 98504

November 16, 1989

REPLY TO ATTN OF: WOO

RECEIVED
NOV 20 1989
Bureau Of Land Management
Spokane, Wa.

Joseph K. Buesing, District Manager
U.S. Department of Interior
Bureau of Land Management
East 4217 Main
Spokane, Washington 99202

Dear Mr. Buesing:

Thank you for submitting the Oroville Landfill Expanded Site Investigation. This and other previously submitted documents have been evaluated using EPA's proposed Hazard Ranking System (HRS II) which is used to evaluate federal facilities for inclusion on the National Priorities List (NPL).

From our evaluation, EPA has determined that this facility does not score high enough on the proposed HRS II system to be included on the NPL. Therefore, a recommendation of no further action (NFA) on EPA's part will be included in our docket tracking system. This determination by EPA will not delete your facility from being listed on the Federal Agency Hazardous Waste Compliance Docket. If new or additional information becomes available that suggests your facility may score high enough to be proposed for the NPL, EPA must evaluate your facility accordingly.

EPA's NFA designation does not relieve your facility from complying with appropriate state regulations. The Superfund Amendments and Reauthorization Act (SARA), Section 120(a)(4) requires federal facilities to comply with state cleanup requirements and standards when they are not listed on the NPL. You should contact the Washington Department of Ecology (Ecology) to find out what activities will be required for your facility to comply with state cleanup standards. The Ecology contact is Clar Pratt (509) 575-2440.

If you have any questions or wish to discuss this issue further I may be reached at (206) 753-9014.

Sincerely,

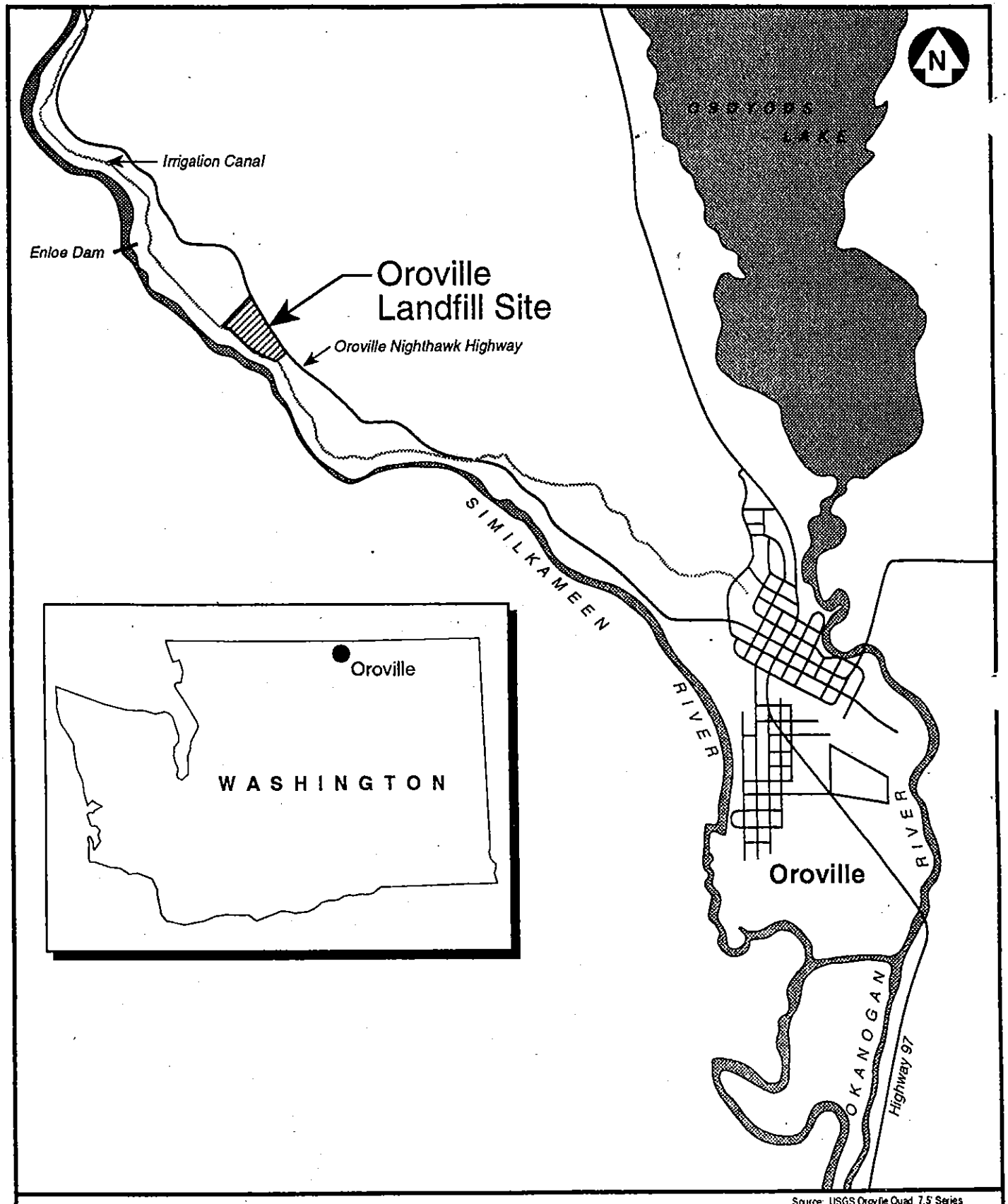
Robert E Kievit

Robert E. Kievit
Hazardous Waste Coordinator
Washington Operations Office

cc: Maureen Toelkes, HW-114
Clar Pratt, CRO
Bob Goodman, Ecology

APPENDIX B

SITE FIGURES



Source: USGS Oroville Quad. 7.5' Series

Scale in Feet

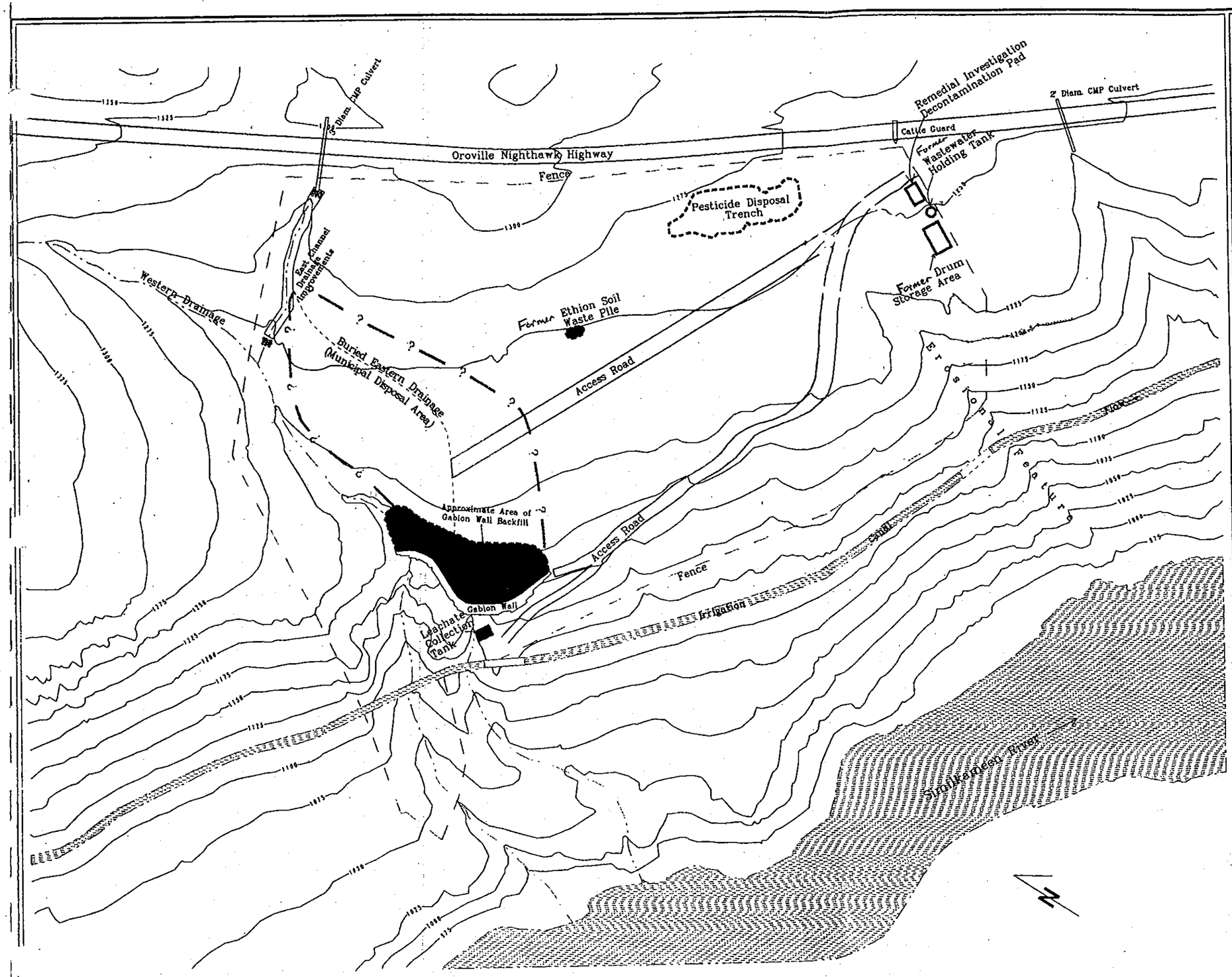
0 4000

Oroville Landfill: Site Location Map

WESTON MANAGERS DESIGNERS CONSULTANTS

JOB NUMBER: 6733-01-02-0060 DATE: July 1992

FIGURE 1-1



Explanation

- Approximate Boundary Line
- Established Boundary Line
- Historical Boundary Line
- ? - Municipal Disposal Area Boundary (very approximately located)

Amended by AEE March 1997

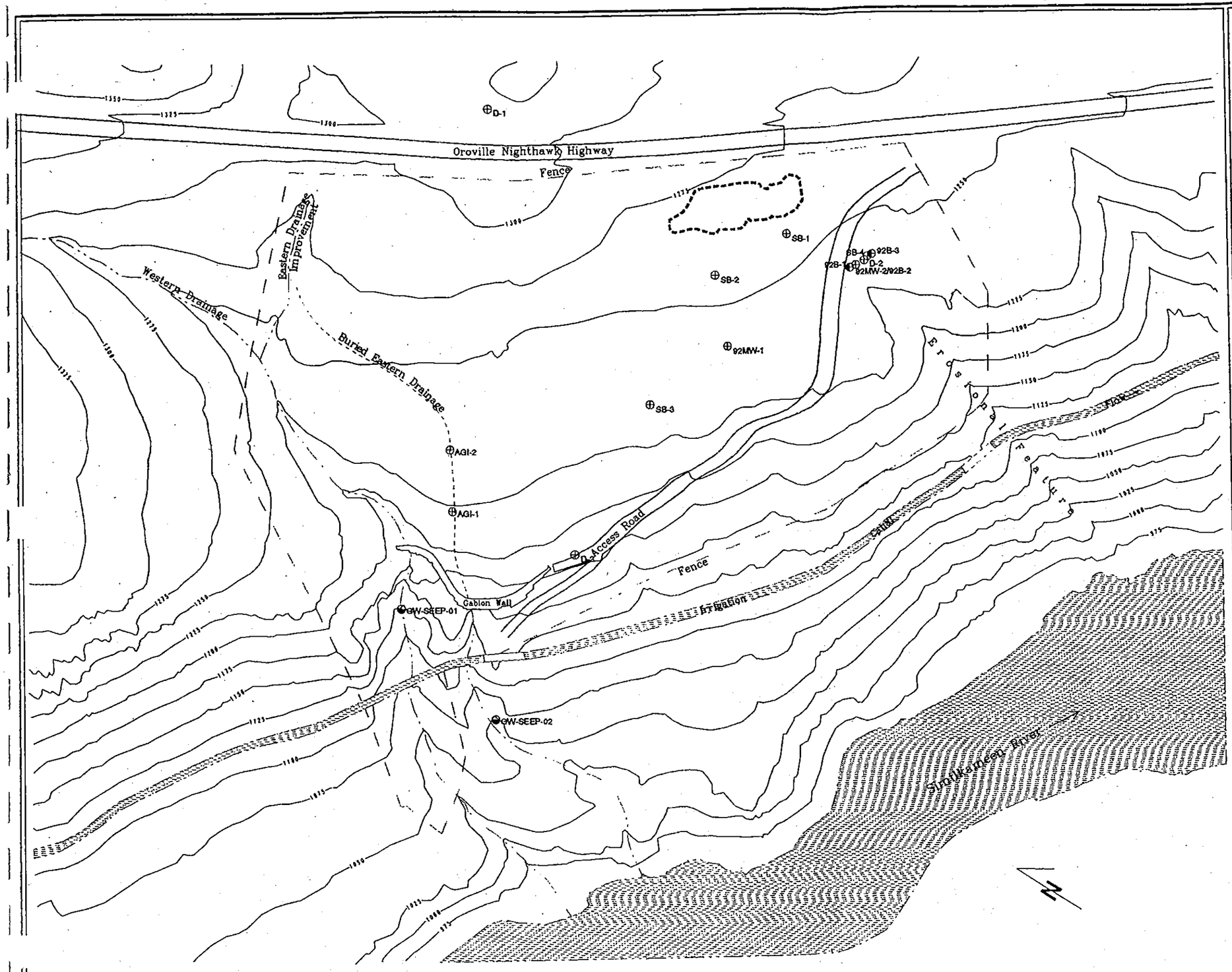
Oroville Landfill: Site Features

Figure 1-2

WESTON MANAGERS DESIGNERS/CONSULTANTS

DATE: July 10, 1993 5:06 PM
JOB NUMBER: 6733-01-02-0060
DELIVERY ROUND: A

0 Meters 45
0 Feet 150



Explanation

- ⊕ D-1 Deep Monitoring Well
- ⊕ AGI-1 Shallow Soil Boring/Monitoring Well
- ◐ 92B-1 Shallow Soil Boring
- ◒ GW-SEEP-01 Seep Sample

AEE Amended 5 March 1997

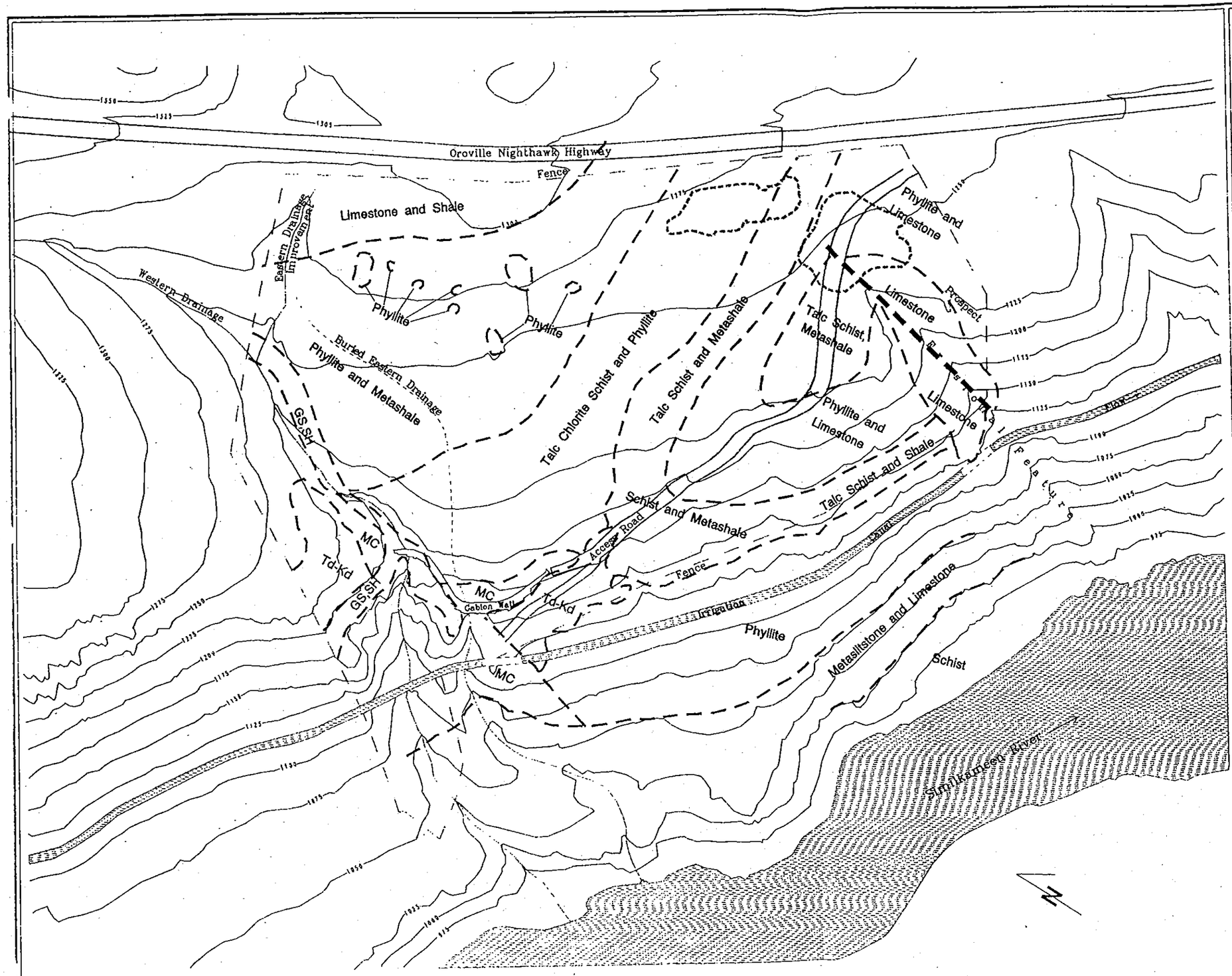
Oroville Landfill:
Subsurface Soil Boring, Monitoring Well, and Seep Sample Locations

Figure 2-2

WESTON MANAGERS DESIGNERS/CONSULTANTS

DATE: July 22, 1993 2:03 PM
JOB NUMBER: 6733-01-02-0060
DELIVERY ROUND: A

0 Meters 45
0 Feet 150



DATE: August 07, 1992 8:41 AM
JOB NUMBER: 6733-01-02-0060
DELIVERY ROUND: A

0 Meters 45
0 Feet 150

Explanation

Td-Kd: Unnamed Cretaceous(?) to Eocene Dacite

Kobau Formation (latest Permian-Triassic)

GS,SH: Greenstone and Tuffaceous Siltstone
MC: Metachert

Anarchist Group (Late Permian)

Metashale
Talc Schist
Limestone
Phyllite
Talc Chlorite Schist
Metasiltstone
Shale

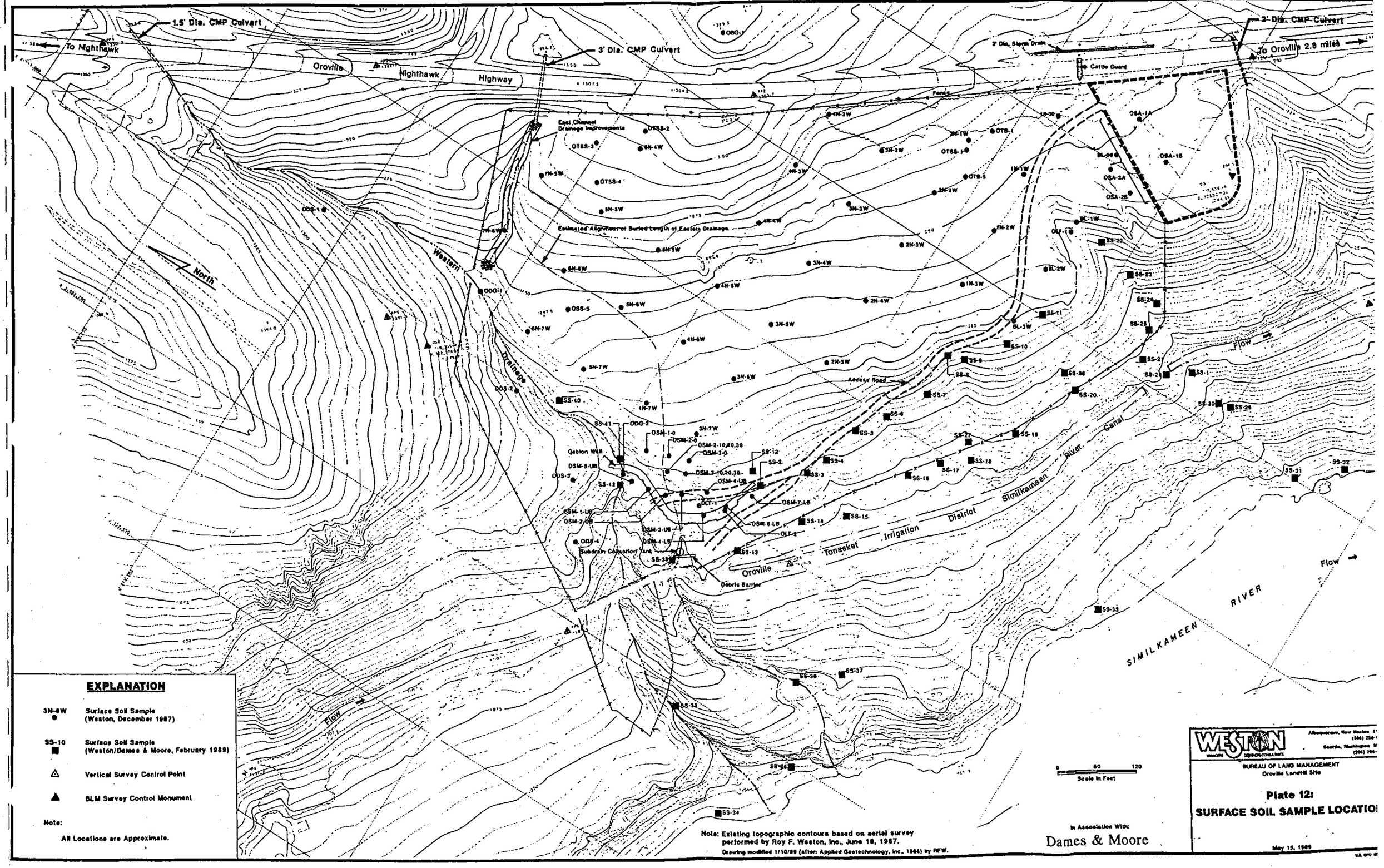
Geologic Contact, Approximately Located

Shear Zone

Modified from WESTON/Dames & Moore (1989)

Oroville Landfill: Site Bedrock Geology

Figure
3-3



EXPLANATION

- 3N-6W ● Surface Soil Sample (Weston, December 1987)
- SS-10 ■ Surface Soil Sample (Weston/Dames & Moore, February 1989)
- △ Vertical Survey Control Point
- ▲ BLM Survey Control Monument

Note:

All Locations are Approximate.

Note: Existing topographic contours based on aerial survey performed by Roy F. Weston, Inc., June 18, 1987.

Drawing modified 1/10/89 (after: Applied Geotechnology, Inc., 1988) by RFW.

In Association With:

Dames & Moore

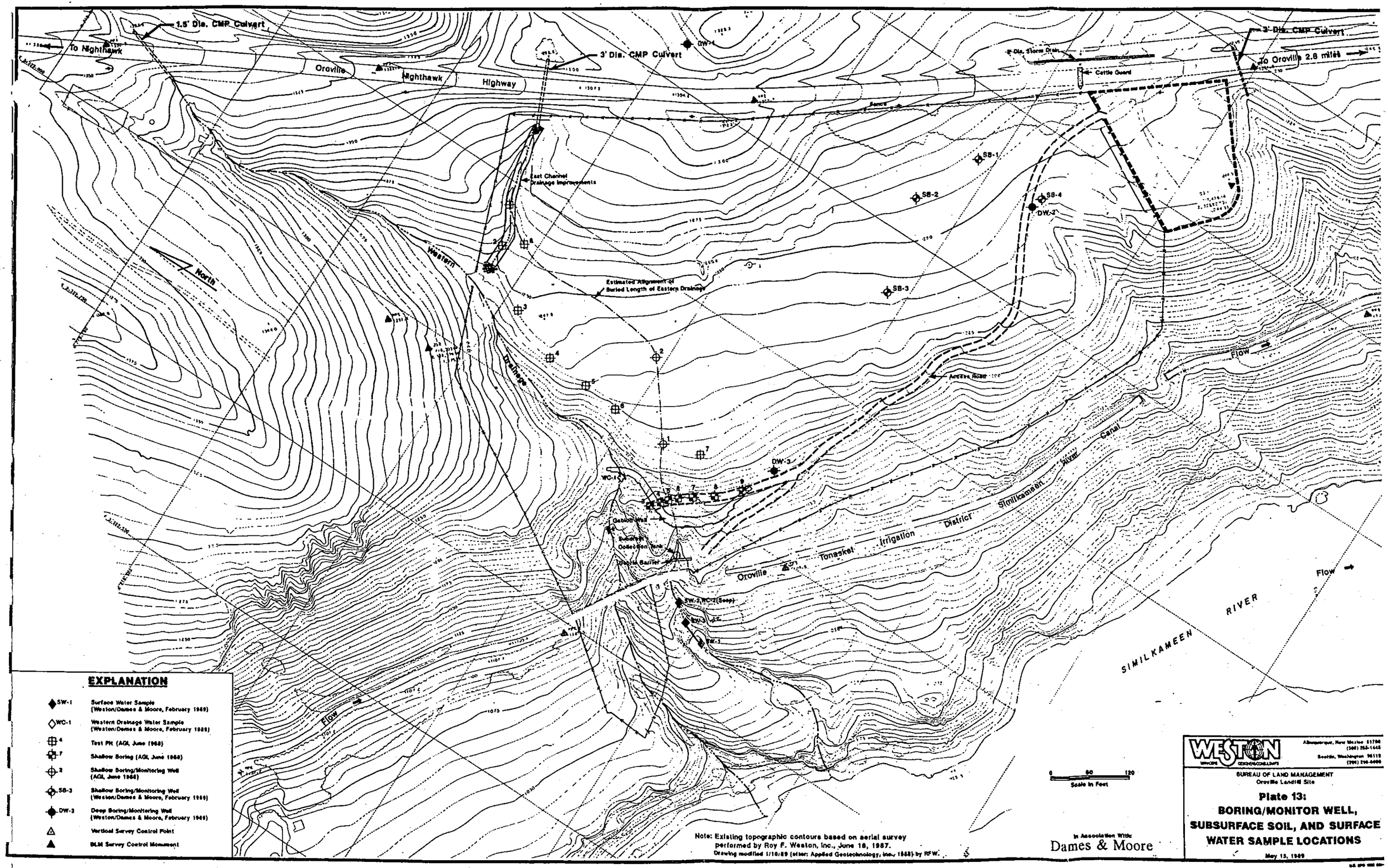
WESTON

BUREAU OF LAND MANAGEMENT
Oroville Landfill Site

Plate 12:

SURFACE SOIL SAMPLE LOCATIO

May 15, 1989



EXPLANATION

- SW-1 — Surface Water Sample (Weston/Dames & Moore, February 1989)
- WC-1 — Western Drainage Water Sample (Weston/Dames & Moore, February 1989)
- 4 — Test Pit (AGI, June 1988)
- 7 — Shallow Boring (AGI, June 1988)
- 2 — Shallow Boring/Monitoring Well (AGI, June 1988)
- SB-3 — Shallow Boring/Monitoring Well (Weston/Dames & Moore, February 1989)
- DW-3 — Deep Boring/Monitoring Well (Weston/Dames & Moore, February 1989)
- △ — Vertical Survey Control Point
- ▲ — BLM Survey Control Monument

Note: Existing topographic contours based on aerial survey performed by Roy F. Weston, Inc., June 16, 1987.
Drawing modified 1/10/89 (other: Applied Geotechnology, Inc., 1988) by RFW.

0 60 120
Scale in Feet

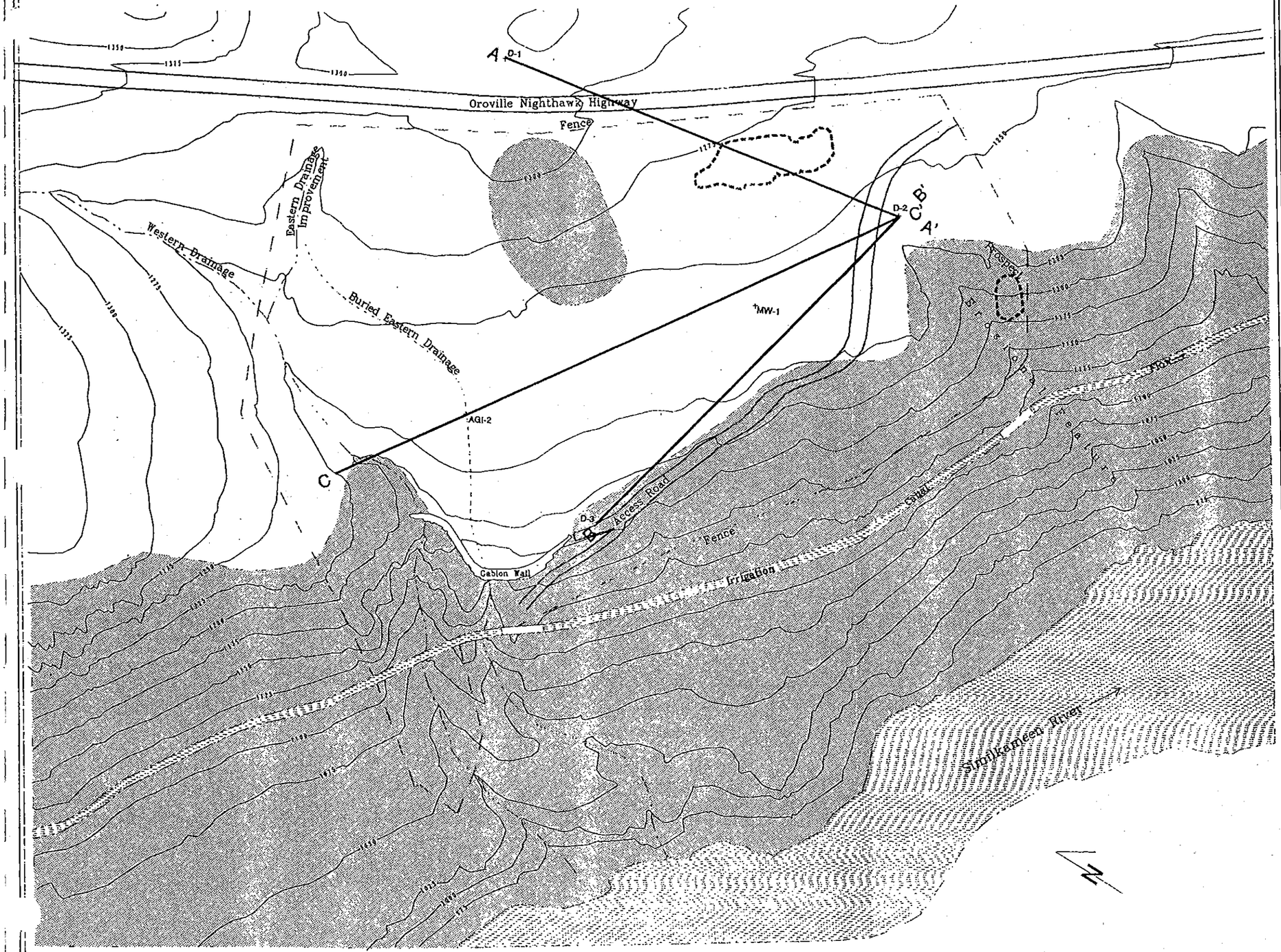
In Association With
Dames & Moore

WESTON GEOPHYSICAL CORP.
Albuquerque, New Mexico 87198 (505) 268-1445
Seattle, Washington 98119 (206) 298-9400

BUREAU OF LAND MANAGEMENT
Oroville Landfill Site

Plate 13:
BORING/MONITOR WELL, SUBSURFACE SOIL, AND SURFACE WATER SAMPLE LOCATIONS

May 15, 1989



Explanation

A - A' Cross-Section Line

Bedrock/Colluvial Soil

Alluvium

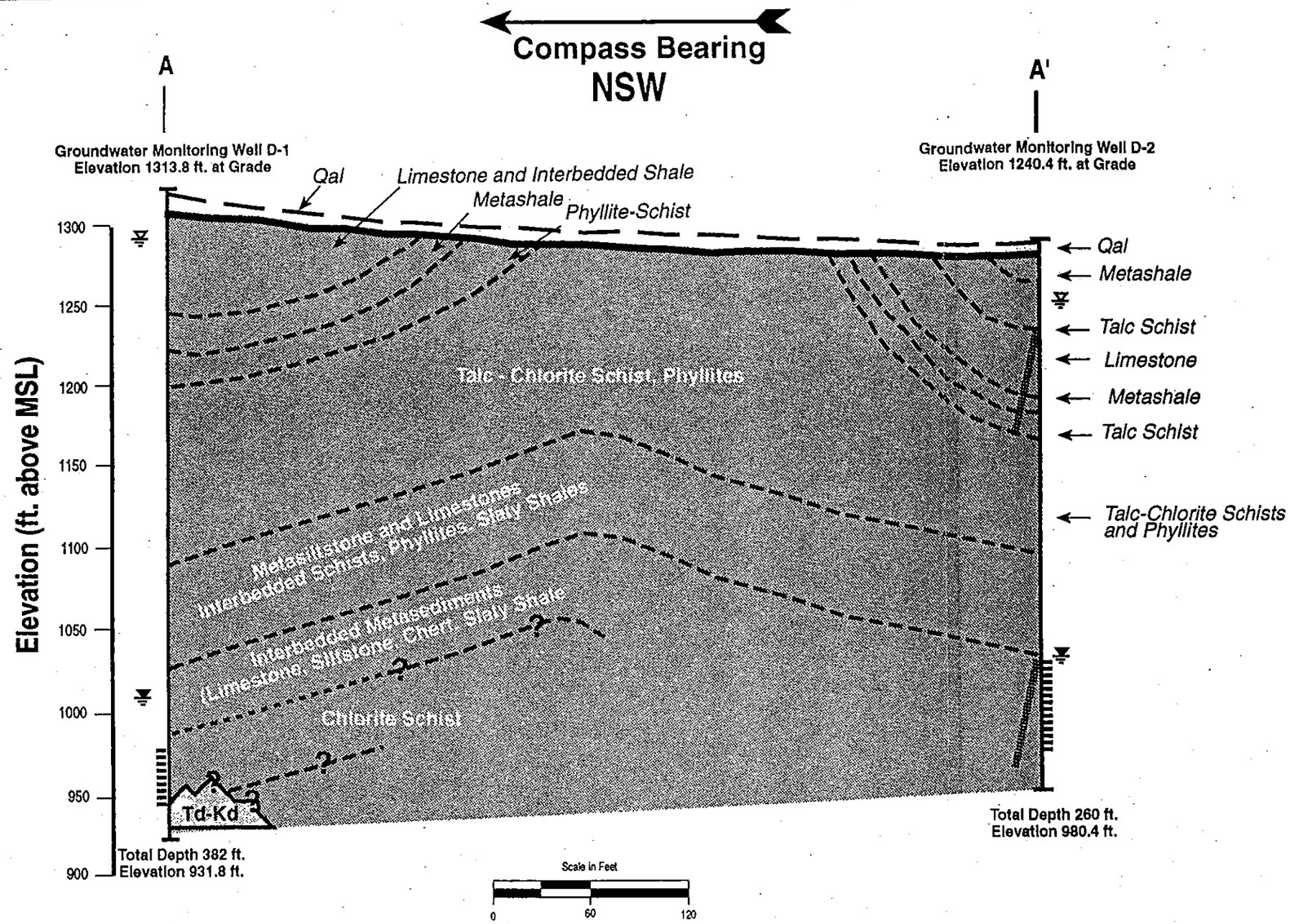
Oroville Landfill: Soil Types and Location of Geologic Cross-Sections

Figure 3-4

WESTON MANAGERS DESIGNERS/CONSULTANTS

DATE: June 15, 1993 12:01 PM
JOB NUMBER: 6733-01-02-0060
DELIVERY ROUND: A

0 Meters 45
0 Feet 150



Explanation

- First occurrence of groundwater during drilling
- Potentiometric Surface (measured 12/29/88)
- Screened Interval
- Geologic Contact
  - Dashed, Approximately Located
  - Queried, Existence Uncertain
- Erosional Surface: Unconformity
- Approximate Location of Geologic Fault
- Qal — Quaternary Alluvium / Surficial Deposits / Fill

Unconformity:

- Td-Kd — Cretaceous - Tertiary Dacite Hypabyssal Intrusive Rocks

Unconformity:

- Permian - Triassic Eugosynclinal Rocks of the Spectacle Formation (Metashales, Metachert, Phyllites, Schists, Limestones, Dolomite Limestones)

Location of section line A-A' is shown in Figure 3-4

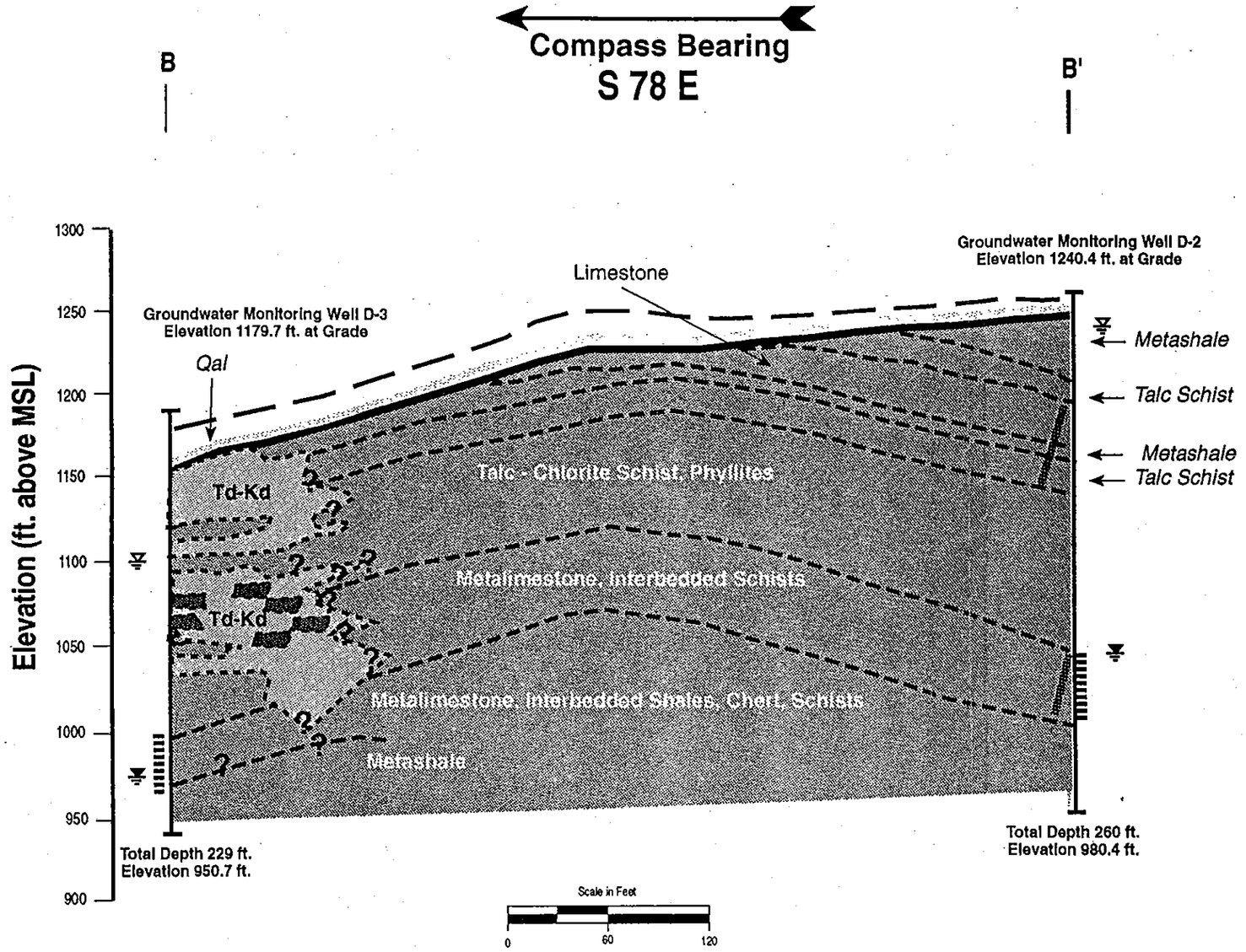
Oroville Landfill:
Site Geologic Cross-Section A-A'

After WESTON / Dames & Moore (1989)

FIGURE
3-5

WESTON MANAGERS DESIGNERS/CONSULTANTS

JOB NUMBER:6733-01-02-0060 DATE: AUGUST 1992



Explanation

- First occurrence of groundwater during drilling
- Potentiometric Surface (measured 12/29/88)
- Screened Interval
- Geologic Contact
  - Dashed, Approximately Located
  - Queried, Existence Uncertain
- Erosional Surface: Unconformity
- Approximate Location of Geologic Fault
- Qal — Quaternary Alluvium / Surficial Deposits / Fill

Unconformity:

- Td-Kd — Cretaceous - Tertiary Dacite Hypabyssal Intrusive Rocks

Unconformity:

- Permian - Triassic Eugosynclinal Rocks of the Spectacle Formation (Metashales, Metachert, Phyllites, Schists, Limestones, Dolomite Limestones)

Location of section line A-A' is shown in Figure 3-4

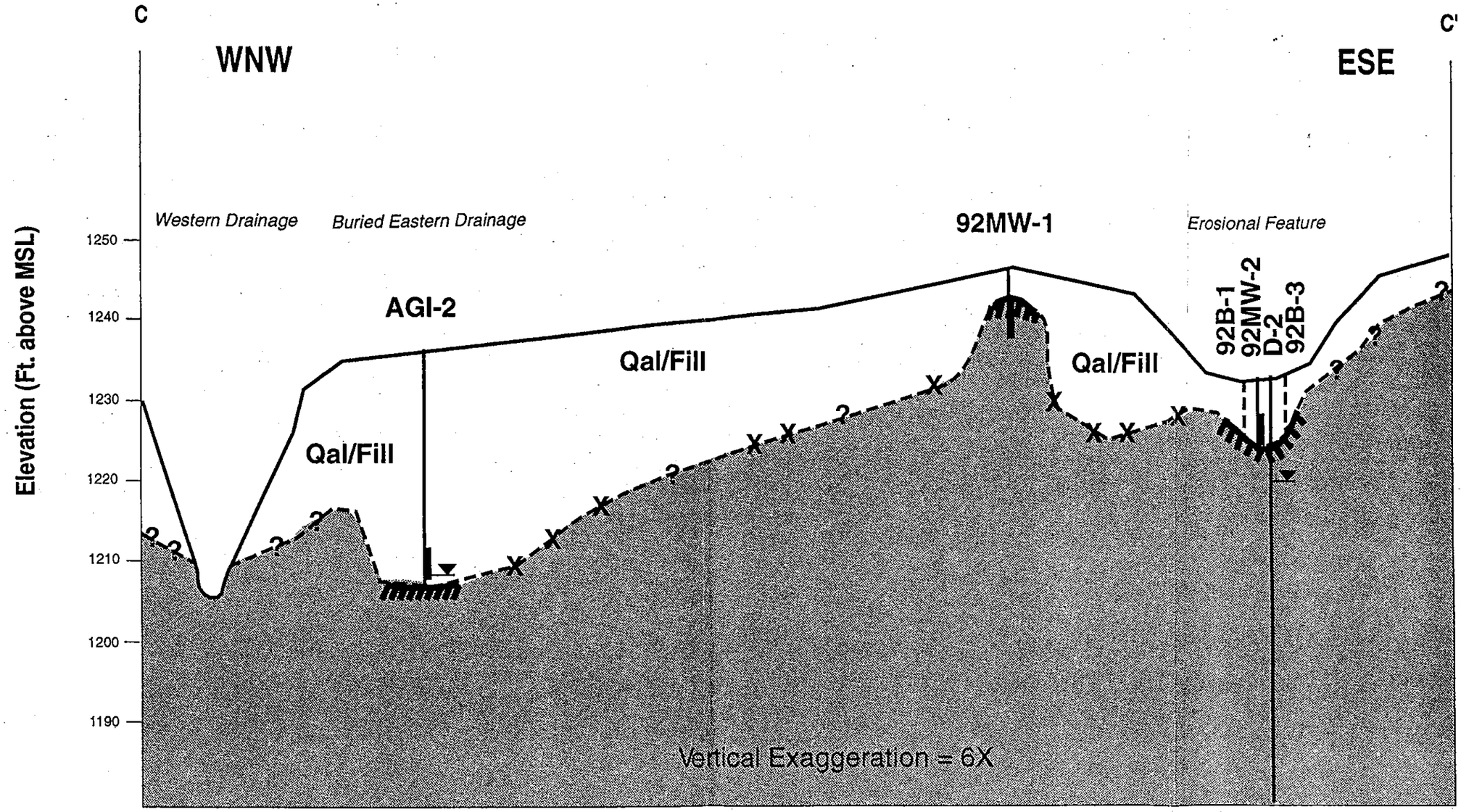
WESTON MANAGERS DESIGNERS/CONSULTANTS

JOB NUMBER:6733-01-02-0060 DATE: AUGUST 1992

Oroville Landfill:
Site Geologic Cross-Section B-B'

After WESTON / Dames & Moore (1989)

FIGURE
3-6



Location of section line C-C' is shown in Figure 3-4

Horizontal Scale: 0.75" = 60' 60'

AGI-2 Monitoring Well and Screen Interval

Highest Recorded Groundwater Level

92B-1 Exploration Boring

Approximate Depth to Bedrock Calculated From Seismic Data (Weston / Dames & Moore, 1989)

Known Bedrock Surface

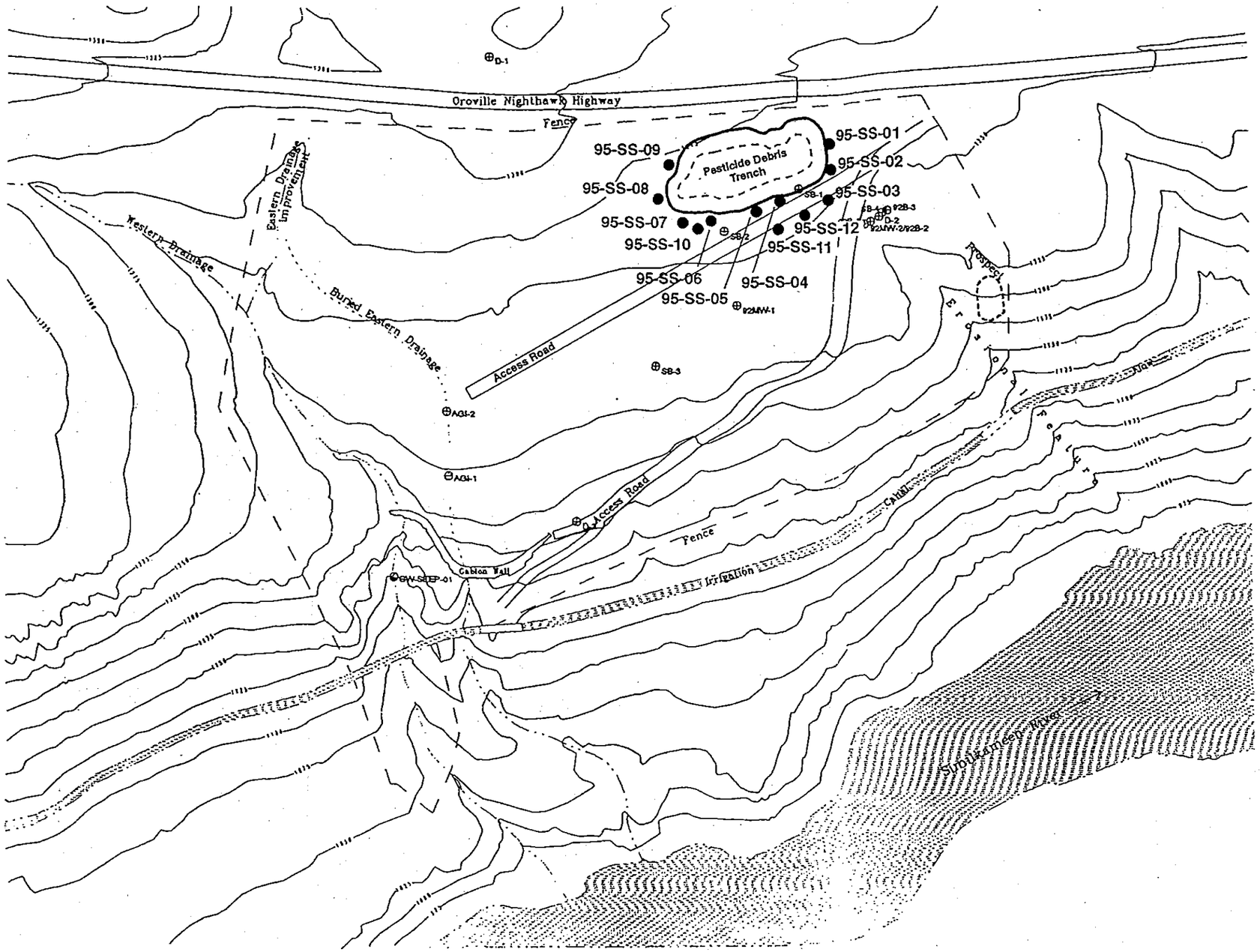
Inferred Bedrock Surface

WESTON MANAGERS DESIGNERS/CONSULTANTS

JOB NUMBER:6733-01-02-0060 DATE: June 1993

Oroville Landfill:
Site Geologic Cross-Section C-C'
Fill Thickness and Bedrock Topography

FIGURE
3-7



WESTON
MANAGERS DESIGNERS/CONSULTANTS
6733-001-007-0001
November 1995

0 75 150
Scale in Feet

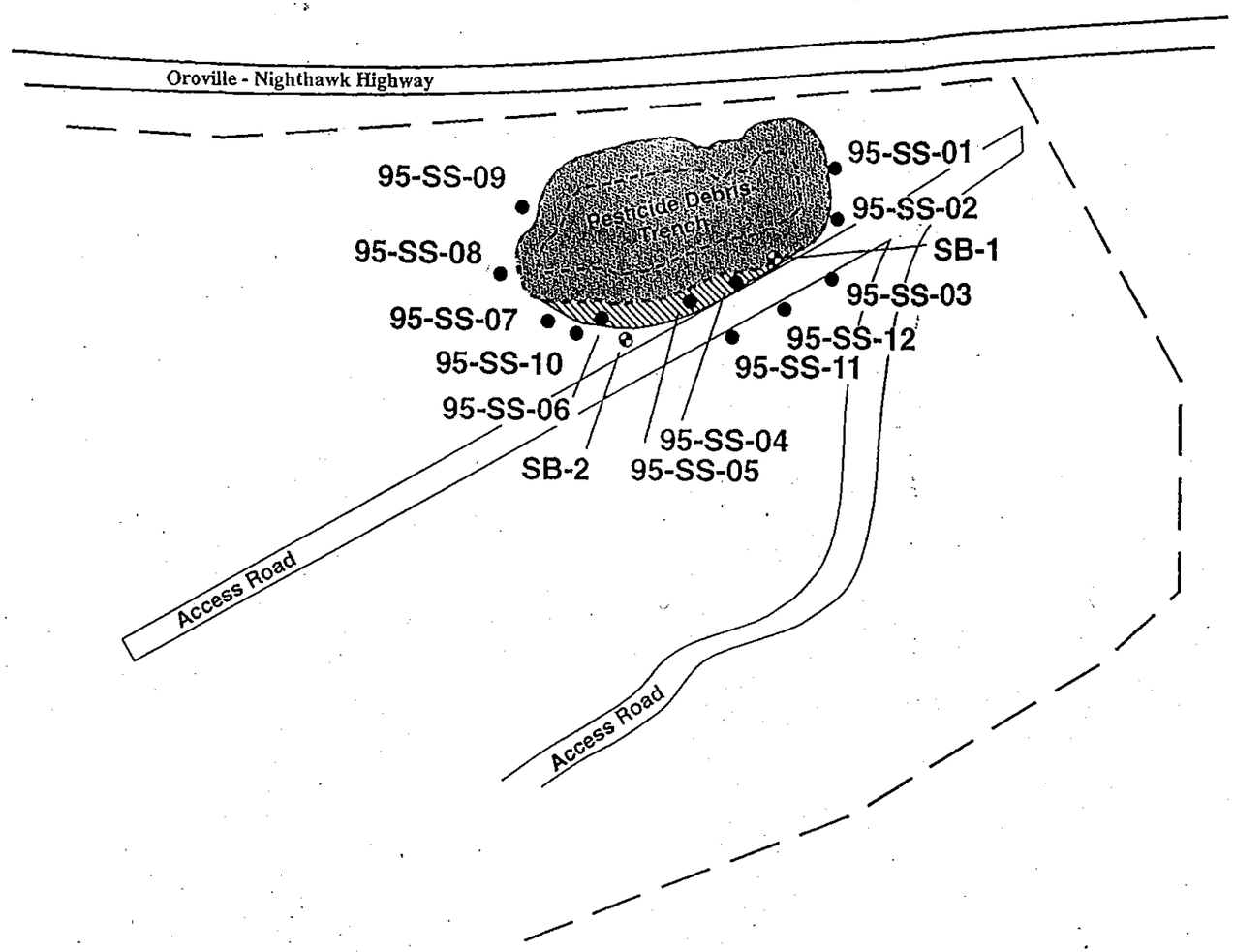
EXPLANATION

95-SS-04 Soil Sample

Cap Outline

Oroville Landfill: Soil Sample Locations October 1995

FIGURE
1



EXPLANATION

- 95-SS-04 — Soil Sample
- SB-1 — Monitoring Well
- Originally Proposed Soil Cap
- Recommended Additional Soil Cap Coverage
- Pesticide Debris Trench Boundary
- Site Fence

0 50 100

Scale in Feet

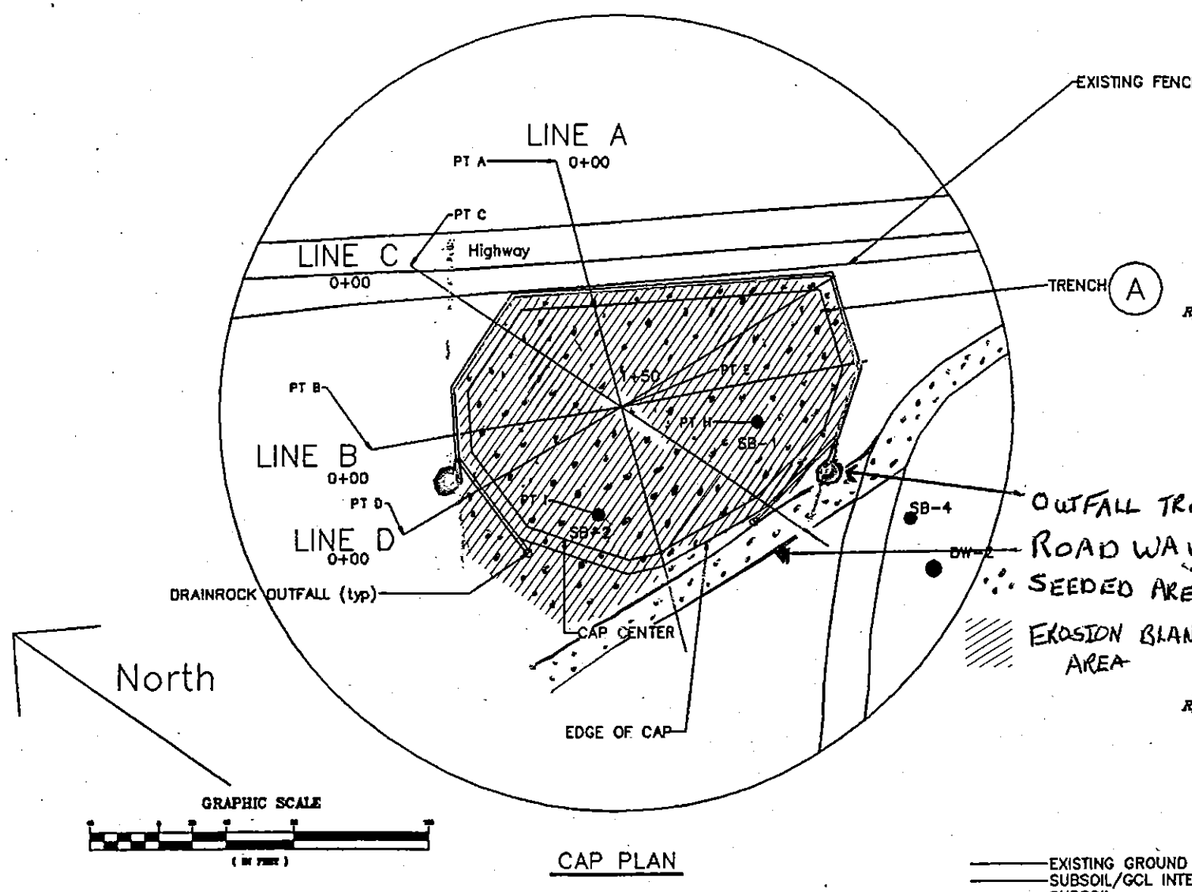
WESTON® MANAGERS DESIGNERS/CONSULTANTS

6733-001-007-0001
December 1995

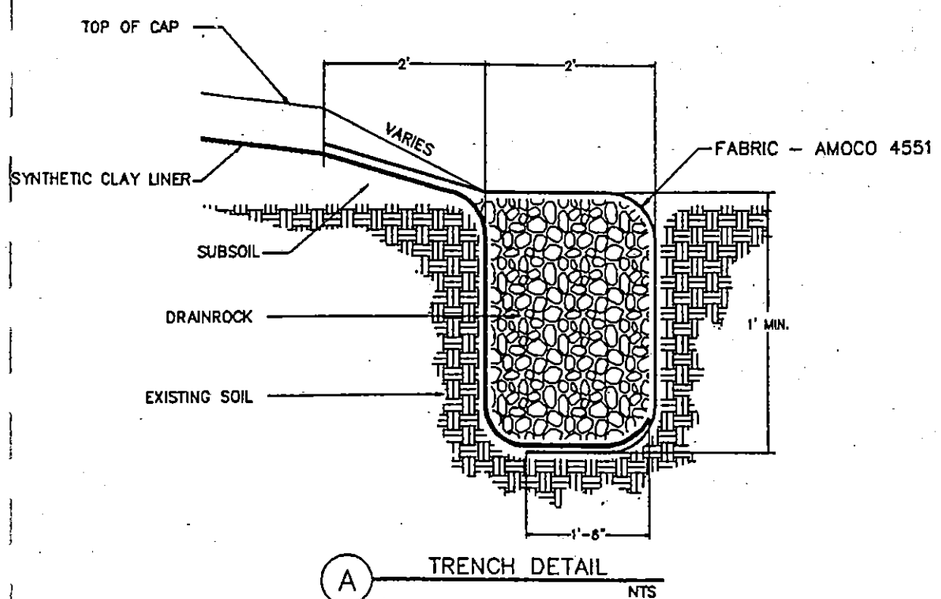
Oroville Landfill: Recommended Soil Cap Coverage

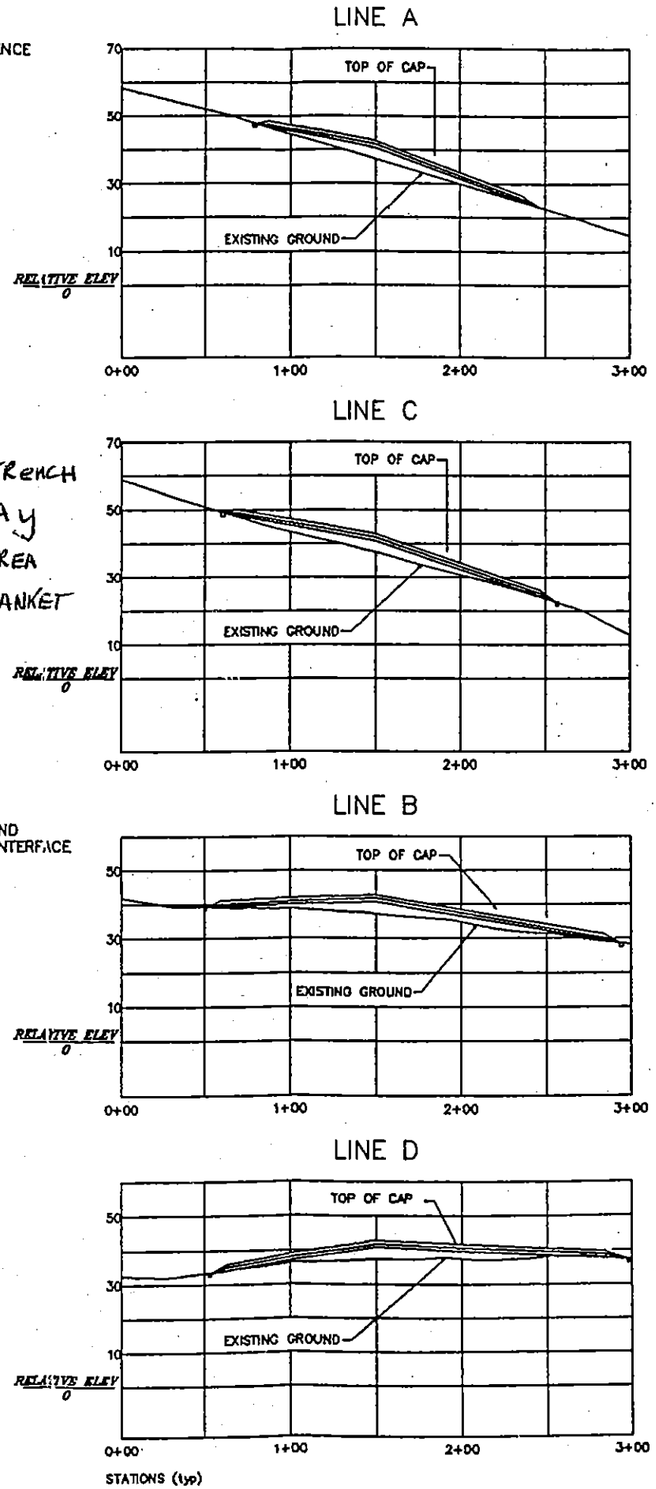
FIGURE
2

Amended by AEE March 1997



CAP PLAN





EXISTING GROUND
SUBSOIL/GCL INTERFACE
SUBSOIL
TOPSOIL

CAP PERIMETER IS STAKED IN THE FIELD.

CAP LAYOUT			
PT	NORTHING	EASTING	DESCRIPTION
A	2322676.12	718447.51	0+00 LINE A
B	2322567.22	718276.57	0+00 LINE B
C	2322590.00	718385.62	0+00 LINE C
D	2322585.79	718226.33	0+00 LINE D
E	2322714.94	718302.62	1+50
H	2322796.96	718293.13	SB-1
I	2322701.40	718238.64	SB-2
T	2322959.38	718395.51	FENCE CORNER
U	2322098.42	718361.42	FENCE CORNER

NOTES:

1. CAP CENTER IS THE AREA 8 FEET INSIDE THE PERIMETER OR TRENCH.
2. PLACE MISCELLANEOUS MATERIALS INTO THE CENTER OF THE CAP (See Specifications). THE CENTER OF THE CAP SHALL HAVE SUBSOIL PLACED FOR DRAINAGE, COVERED BY AN APPROVED GEOSYNTHETIC CLAY LINER (GCL), 1 FOOT OF SUBSOIL OVER THE GCL, AND 1 FOOT OF TOPSOIL OVER THE SUBSOIL.

   TOP OF CAP SHALL BE SEEDED AND COVERED WITH AN APPROVED EROSION CONTROL BLANKET.
4. SLOPE EACH LAYER OF THE CAP TO DRAIN.
5. SLOPE TRENCH TO DRAIN TOWARD DRAINROCK OUTFALLS.
6. DRAINROCK OUTFALLS SHALL BE A MINIMUM OF 5 FEET IN DIAMETER AND 1 FOOT DEEP. CENTER OF OUTFALL IS FIELD LOCATED.

REV. NO.	DESCRIPTION	DATE	APPROVED
2	CAP CONSTRUCTION & SIZE	6/4	

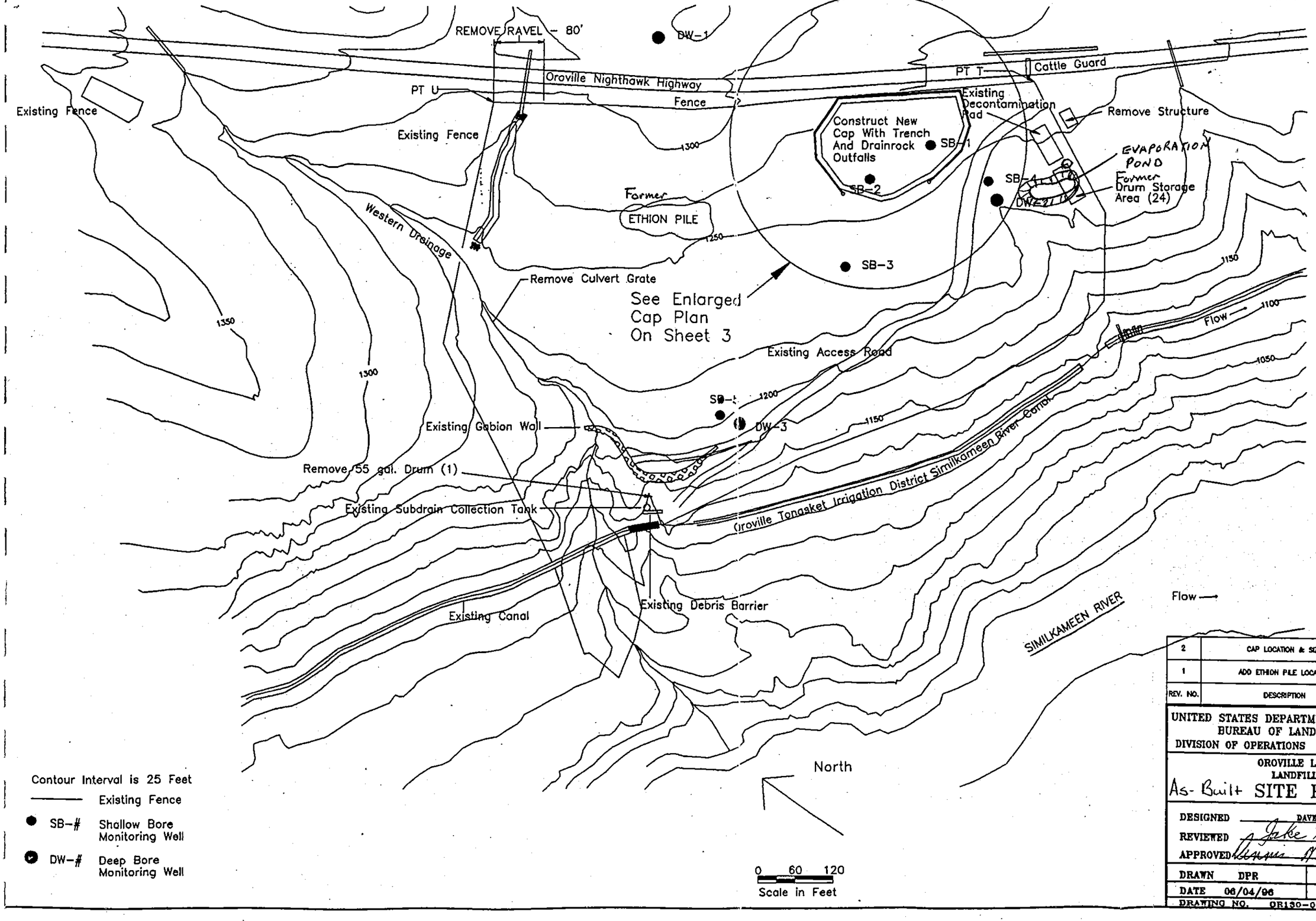
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF OPERATIONS SPOKANE DISTRICT

OROVILLE LANDFILL
LANDFILL CAP
As- Built DETAILS

DESIGNED DAVE ROSENFRANCE
REVIEWED
APPROVED

DRAWN DPR
DATE 06/04/96
SCALE AS SHOWN
SHEET 3 OF 9
DRAWING NO. OR1S0-02999-02

Amended by AEE March 1997



Contour Interval is 25 Feet

——— Existing Fence

● SB–# Shallow Bore Monitoring Well

● DW–# Deep Bore Monitoring Well

REV. NO.	DESCRIPTION	DATE	APPROVED
2	CAP LOCATION & SIZE	6/4	
1	ADD ETHION PILE LOCATION	9/8/95	

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF OPERATIONS SPOKANE DISTRICT

OROVILLE LANDFILL
LANDFILL CAP

As-Built SITE PLAN

DESIGNED DAVE ROSENKRANCE
REVIEWED Jake Jakubiak
APPROVED

DRAWN DPR	SCALE AS SHOWN
DATE 06/04/96	SHEET 2 OF 9
DRAWING NO. OR130-02999-01	

Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, Washington 98104-5057
206-521-7600 • Fax 206-521-7601

MEMORANDUM

DATE: 3 January 1996

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB.
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: QA of Case 9510G937 (Pesticides and PCBs)
Site: BLM Oroville

WORK ORDER NO.: 06733-001-007-0001-00

The quality assurance review of 12 samples, Case 9510G937 collected from BLM Oroville has been completed. The soil samples were analyzed at low level for pesticides and PCBs by Weston Environmental Metrics, Inc., University Park, Illinois. The samples were numbered:

95-SS-01	95-SS-02	95-SS-03	95-SS-04	95-SS-05
95-SS-06	95-SS-07	95-SS-08	95-SS-09	95-SS-10
95-SS-11	95-SS-12			

Data Qualifications

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in SOW OLM01.8 as described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240.1-05, February 1994).

1. Timeliness

   All samples met holding time criteria.

2. Detection Limits—Acceptable

   Instrument detection limits were not provided by the laboratory. Detection limits for some samples were significantly elevated due to high concentrations of one or more target analytes.

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The compound was analyzed for, but was not detected.

UJ - The compound was analyzed for, but was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less then CRDL or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

N - Presumptive evidence of presence of material (tentative identification).

D - DILUTED

WESTON®
MANAGERS DESIGNERS/CONSULTANTS

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-01
Project # 06733-001-007-0001
Lab ID: 9510G937-001
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	40	U
beta-BHC	BRL	40	U
delta-BHC	BRL	40	U
gamma-BHC (Lindane)	BRL	40	U
Heptachlor	BRL	40	U
Aldrin	BRL	40	U
Heptachlor epoxide	BRL	40	U
Endosulfan I	BRL	40	U
Dieldrin	BRL	81	U
4,4'-DDE	210	81	
Endrin	BRL	81	U
Endosulfan II	BRL	81	U
4,4'-DDD	26	81	J
Endosulfan sulfate	BRL	81	U
4,4'-DDT	150	81	
Methoxychlor	BRL	400	U
Endrin ketone	BRL	81	U

J.M.B. 12.1.95

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To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-01
Project # 06733-001-007-0001
Lab ID: 9510G937-001
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	400	U
gamma-Chlordane	BRL	400	U
Endrin aldehyde	BRL	16	U
Toxaphene	BRL	810	U

J. M.B. 12/1/95

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Fax: (708) 534-5211

To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-02
Project # 06733-001-007-0001
Lab ID: 9510G937-002
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	20	U
beta-BHC	BRL	20	U
delta-BHC	BRL	20	U
gamma-BHC (Lindane)	BRL	20	U
Heptachlor	BRL	20	U
Aldrin	BRL	20	U
Heptachlor epoxide	BRL	20	U
Endosulfan I	BRL	20	U
Dieldrin	BRL	41	U
4,4'-DDE	82	41	
Endrin	BRL	41	U
Endosulfan II	BRL	41	U
4,4'-DDD	8.8	41	J
Endosulfan sulfate	BRL	41	U
4,4'-DDT	99	41	
Methoxychlor	BRL	200	U
Endrin ketone	BRL	41	U

J.M.B. 12/1/95

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To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-02
Project # 06733-001-007-0001
Lab ID: 9510G937-002
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	200	U
gamma-Chlordane	BRL	200	U
Endrin aldehyde	BRL	8.1	U
Toxaphene	BRL	410	U

12/1/95

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Fax: (708) 534-5211

To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-03
Project # 06733-001-007-0001
Lab ID: 9510G937-003
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	20	U
beta-BHC	BRL	20	U
delta-BHC	BRL	20	U
gamma-BHC (Lindane)	BRL	20	U
Heptachlor	BRL	20	U
Aldrin	BRL	20	U
Heptachlor epoxide	BRL	20	U
Endosulfan I	BRL	20	U
Dieldrin	BRL	40	U
4,4'-DDE	130	40	
Endrin	BRL	40	U
Endosulfan II	BRL	40	U
4,4'-DDD	40	40	
Endosulfan sulfate	BRL	40	U
4,4'-DDT	430	40	D
Methoxychlor	BRL	200	U
Endrin ketone	BRL	40	U

J.M.B. 12/1/95

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To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-03
Project # 06733-001-007-0001
Lab ID: 9510G937-003
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	200	U
gamma-Chlordane	BRL	200	U
Endrin aldehyde	BRL	8.0	U
Toxaphene	BRL	400	U

J.M.B. 12/1/95

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Fax: (708) 534-5211

To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-03
Project # 06733-001-007-0001
Lab ID: 9510G937-003 DL
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
4,4'-DDT	430	160	

J. M. B. 12/1/95

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Fax: (708) 534-5211

To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-04
Project # 06733-001-007-0001
Lab ID: 9510G937-004
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	4000	U
beta-BHC	BRL	4000	U
delta-BHC	BRL	4000	U
gamma-BHC (Lindane)	BRL	4000	U
Heptachlor	BRL	4000	U
Aldrin	BRL	4000	U
Heptachlor epoxide	BRL	4000	U
Endosulfan I	BRL	4000	U
Dieldrin	BRL	8100	U
4,4'-DDE	6600	8100	J
Endrin	BRL	8100	U
Endosulfan II	BRL	8100	U
4,4'-DDD	1800	8100	J
Endosulfan sulfate	BRL	8100	U
4,4'-DDT	17000	8100	
Methoxychlor	BRL	40000	U
Endrin ketone	BRL	8100	U

J.M.B. 12/1/95

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Fax: (708) 534-5211

To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-04
Project # 06733-001-007-0001
Lab ID: 9510G937-004
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	40000	U
gamma-Chlordane	BRL	40000	U
Endrin aldehyde	BRL	1600	U
Toxaphene	BRL	81000	U

J.M.B 12/1/95

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Fax: (708) 534-5211

To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-05
Project # 06733-001-007-0001
Lab ID: 9510G937-005
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	410	U
beta-BHC	BRL	410	U
delta-BHC	BRL	410	U
gamma-BHC (Lindane)	BRL	410	U
Heptachlor	BRL	410	U
Aldrin	BRL	410	U
Heptachlor epoxide	BRL	410	U
Endosulfan I	BRL	410	U
Dieldrin	BRL	820	U
4,4'-DDE	900	820	
Endrin	BRL	820	U
Endosulfan II	BRL	820	U
4,4'-DDD	290	820	J
Endosulfan sulfate	BRL	820	U
4,4'-DDT	1200	820	
Methoxychlor	BRL	4100	U
Endrin ketone	BRL	820	U

JMB 12/1/95

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MANAGERS DESIGNERS/CONSULTANTS

2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-05
Project # 06733-001-007-0001
Lab ID: 9510G937-005
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	4100	U
gamma-Chlordane	BRL	4100	U
Endrin aldehyde	BRL	160	U
Toxaphene	BRL	8200	U

J.M.B. 12/1/95

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To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-06
Project # 06733-001-007-0001
Lab ID: 9510G937-006
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	4100	U
beta-BHC	BRL	4100	U
delta-BHC	BRL	4100	U
gamma-BHC (Lindane)	BRL	4100	U
Heptachlor	BRL	4100	U
Aldrin	BRL	4100	U
Heptachlor epoxide	BRL	4100	U
Endosulfan I	BRL	4100	U
Dieldrin	BRL	8200	U
4,4'-DDE	4000	8200	J
Endrin	BRL	8200	U
Endosulfan II	BRL	8200	U
4,4'-DDD	1700	8200	J
Endosulfan sulfate	BRL	8200	U
4,4'-DDT	14000	8200	
Methoxychlor	BRL	41000	U
Endrin ketone	BRL	8200	U

J.M.B. 12/1/95

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Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-06
Project # 06733-001-007-0001
Lab ID: 9510G937-006
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	41000	U
gamma-Chlordane	BRL	41000	U
Endrin aldehyde	BRL	1600	U
Toxaphene	BRL	82000	U

J.M.B. 12/1/95

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To: BLM-Oroville
Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-07
Project # 06733-001-007-0001
Lab ID: 9510G937-007
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	40	U
beta-BHC	BRL	40	U
delta-BHC	BRL	40	U
gamma-BHC (Lindane)	BRL	40	U
Heptachlor	BRL	40	U
Aldrin	BRL	40	U
Heptachlor epoxide	BRL	40	U
Endosulfan I	BRL	40	U
Dieldrin	BRL	81	U
4,4'-DDE	1100 E	81	D
Endrin	BRL	81	U
Endosulfan II	BRL	81	U
4,4'-DDD	59	81	J
Endosulfan sulfate	BRL	81	U
4,4'-DDT	720 E	81	D
Methoxychlor	BRL	400	U
Endrin ketone	BRL	81	U

J.M.B. 12/1/95

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Roy F. Weston, Incorporated
700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-07
Project # 06733-001-007-0001
Lab ID: 9510G937-007
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	400	U
gamma-Chlordane	BRL	400	U
Endrin aldehyde	BRL	16	U
Toxaphene	BRL	810	U

J.M.B. 12/1/95

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Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-07
Project # 06733-001-007-0001
Lab ID: 9510G937-007 DL
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
4,4'-DDE	1100	810	
4,4'-DDT	720	810	

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700 5th Avenue, Suite 5700
Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-08
Project # 06733-001-007-0001
Lab ID: 9510G937-008
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	4.1	U
beta-BHC	BRL	4.1	U
delta-BHC	BRL	4.1	U
gamma-BHC (Lindane)	BRL	4.1	U
Heptachlor	BRL	4.1	U
Aldrin	BRL	4.1	U
Heptachlor epoxide	BRL	4.1	U
Endosulfan I	BRL	4.1	U
Dieldrin	BRL	8.1	U
4,4'-DDE	6.4	8.1	J
Endrin	BRL	8.1	U
Endosulfan II	BRL	8.1	U
4,4'-DDD	BRL	8.1	U
Endosulfan sulfate	BRL	8.1	U
4,4'-DDT	15	8.1	
Methoxychlor	BRL	41	U
Endrin ketone	BRL	8.1	U

J.M.G. 12/1/95

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Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-08
Project # 06733-001-007-0001
Lab ID: 9510G937-008
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	41	U
gamma-Chlordane	BRL	41	U
Endrin aldehyde	BRL	1.6	U
Toxaphene	BRL	81	U

J M.B. 12.1.15

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To: BLM-Oroville
Roy F. Weston, Incorporated
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Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-09
Project # 06733-001-007-0001
Lab ID: 9510G937-009
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	40	U
beta-BHC	BRL	40	U
delta-BHC	BRL	40	U
gamma-BHC (Lindane)	BRL	40	U
Heptachlor	BRL	40	U
Aldrin	BRL	40	U
Heptachlor epoxide	BRL	40	U
Endosulfan I	BRL	40	U
Dieldrin	BRL	81	U
4,4'-DDE	400	81	
Endrin	BRL	81	U
Endosulfan II	BRL	81	U
4,4'-DDD	78	81	J
Endosulfan sulfate	BRL	81	U
4,4'-DDT	180	81	
Methoxychlor	BRL	400	U
Endrin ketone	BRL	81	U

J.M.B. 12/1/95

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Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-09
Project # 06733-001-007-0001
Lab ID: 9510G937-009
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	400	U
gamma-Chlordane	BRL	400	U
Endrin aldehyde	BRL	16	U
Toxaphene	BRL	810	U

J.M.B. 12/1/95

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Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-10
Project # 06733-001-007-0001
Lab ID: 9510G937-010
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	410	U
beta-BHC	BRL	410	U
delta-BHC	BRL	410	U
gamma-BHC (Lindane)	BRL	410	U
Heptachlor	BRL	410	U
Aldrin	BRL	410	U
Heptachlor epoxide	BRL	410	U
Endosulfan I	BRL	410	U
Dieldrin	BRL	810	U
4,4'-DDE	2000	810	
Endrin	BRL	810	U
Endosulfan II	BRL	810	U
4,4'-DDD	100	810	J
Endosulfan sulfate	BRL	810	U
4,4'-DDT	1400	810	
Methoxychlor	BRL	4100	U
Endrin ketone	BRL	810	U

J.M.B. 12/1/95

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Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-10
Project # 06733-001-007-0001
Lab ID: 9510G937-010
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	4100	U
gamma-Chlordane	BRL	4100	U
Endrin aldehyde	BRL	160	U
Toxaphene	BRL	8100	U

J. MB 12/1/95

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Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-11
Project # 06733-001-007-0001
Lab ID: 9510G937-011
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	410	U
beta-BHC	BRL	410	U
delta-BHC	BRL	410	U
gamma-BHC (Lindane)	BRL	410	U
Heptachlor	BRL	410	U
Aldrin	BRL	410	U
Heptachlor epoxide	BRL	410	U
Endosulfan I	BRL	410	U
Dieldrin	BRL	820	U
4,4'-DDE	1000	820	
Endrin	BRL	820	U
Endosulfan II	BRL	820	U
4,4'-DDD	480	820	J
Endosulfan sulfate	BRL	820	U
4,4'-DDT	3400	820	
Methoxychlor	BRL	4100	U
Endrin ketone	BRL	820	U

JMB 12/1/95

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Date: Monday November 20th, 1995

RE: 95-SS-11
Project # 06733-001-007-0001
Lab ID: 9510G937-011
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	4100	U
gamma-Chlordane	BRL	4100	U
Endrin aldehyde	BRL	160	U
Toxaphene	BRL	8200	U

JMB 12/1/95

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Seattle, WA 98104-5057

Attn: Mr. Roger McGinnis

Date: Monday November 20th, 1995

RE: 95-SS-12
Project # 06733-001-007-0001
Lab ID: 9510G937-012
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-BHC	BRL	200	U
beta-BHC	BRL	200	U
delta-BHC	BRL	200	U
gamma-BHC (Lindane)	BRL	200	U
Heptachlor	BRL	200	U
Aldrin	BRL	200	U
Heptachlor epoxide	BRL	200	U
Endosulfan I	BRL	200	U
Dieldrin	BRL	400	U
4,4'-DDE	640	400	
Endrin	BRL	400	U
Endosulfan II	BRL	400	U
4,4'-DDD	82	400	J
Endosulfan sulfate	BRL	400	U
4,4'-DDT	1100	400	
Methoxychlor	BRL	2000	U
Endrin ketone	BRL	400	U

J.M.B. 12/1/95

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RE: 95-SS-12
Project # 06733-001-007-0001
Lab ID: 9510G937-012
Sample Date: 10/25/95
Date Received: 10/27/95
Units: UG/KG

PESTICIDES/PCB BY GC, SPECIAL LIST

Compound	Result	Reporting Limit	Flag
alpha-Chlordane	BRL	2000	U
gamma-Chlordane	BRL	2000	U
Endrin aldehyde	BRL	80	U
Toxaphene	BRL	4000	U

J MB
12/1/95
36

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201 ELLIOTT AVENUE WEST
SUITE 500
SEATTLE, WA 98119-4208
206-286-6000 • FAX: 206-286-6607

28 January 1993

Mr. Jake Jakabosky
Bureau of Land Management
Spokane District Office
East 4217 Main Avenue
Spokane, WA 99202

WO 6733-01-02-0011

Subject: Analytical Results for Soil and Water Wastes
Oroville Landfill RI/FS
Contract No. H952-C-1-1195

Dear Jake:

Enclosed is a complete printout of the analytical results for the pile and drums of waste soil generated by AGI in 1988, the drum of sediment from the leachate collection system storage tank, and investigation-derived wastewater in the 1000-gallon storage tank.

The sample ID numbers are as follows:

92-WW-D1	Composite from two drums of waste soil generated by AGI in 1988.
92-WW-D2	Drum of sediment from leachate system collection tank.
92-WW-P1	Pile of waste soil generated by AGI in 1988 (Discrete Sample 1).
92-WW-P2	Pile of waste soil generated by AGI in 1988 (Discrete Sample 2).
GW-WWT-92	Investigation-derived wastewater in 1000-gallon tank.

DISPOSED TO TSDF, 1993

Give me a call if you have any questions.

Sincerely,

ROY F. WESTON, INC.

Keith A. Pine, RG
Project Manager

RFW067.DOC
KAP/pln
Enclosures
cc: Chron file

TABLE 2: HITS ONLY LISTING

SAMPLE NUMBER: GW-WWT-92	No. HITS	CONCENTRATION	QUALIFIER & UNITS
INORGANICS (TOTAL)			
Arsenic	1	37.20000	J UG/L
Barium	1	447.00000	UG/L
Cadmium	1	6.10000	UG/L
Chromium	1	68.50000	UG/L
Lead	1	84.60000	UG/L
Selenium	1	9.00000	UG/L
BNA'S			
** 2-3 RING PAH's **			
** CARCINOGENIC PAH's **			
VOC'S			
PESTICIDES/PCB			
Heptachlor epoxide	1	0.02000	J UG/L
Endosulfan I	1	0.03000	J UG/L
Dieldrin	1	2.10000	J UG/L
4,4'-DDE	1	0.51000	J UG/L
Endrin	1	0.07100	J UG/L
Endosulfan II	1	0.62000	J UG/L
4,4'-DDT	1	0.73000	BJ UG/L
TOTAL ORGANIC HALOGEN			
TOTAL ORGANIC HALOGEN	1	0.13000	J MG/L

RPTFORM	CAS_NO	COMPOUND OROVILLE LANDFILL (6/12/92) All Waste Samples full data set Full Data Listing: REPORTS\ALLWS2L1 (1 of 1) Executed: 01/27/93– 10:41 Samples : 1–6 of 5 Total	N_HITS	V1	Q1	V2	Q2	V3	Q3
		SAMPLE ID:		92-WW-D1 Composite from 2 waste soil Drums		92-WW-D2 Leachate Collection Tank Sediment		92-WW-P1 Waste Soil Pile (ETHION)	
I-TOTAL		INORGANICS (TOTAL)							
I-TOTAL	7429-90-5	Aluminum							
I-TOTAL	7440-36-0	Antimony							
I-TOTAL	7440-38-2	Arsenic							
I-TOTAL	7440-39-3	Barium	5	38.10000 =	MG/KG	3.90000 J	MG/KG	32.40000 =	MG/KG
I-TOTAL	7440-41-7	Beryllium	5	95.40000 =	MG/KG	128.00000	MG/KG	86.50000 =	MG/KG
I-TOTAL	7440-43-9	Cadmium							
I-TOTAL	7440-70-2	Calcium	3	0.51000 J	MG/KG	0.54000 J	MG/KG	0.40000 U	MG/KG
I-TOTAL	7440-47-3	Chromium							
I-TOTAL	7440-48-4	Cobalt	5	35.80000 =	MG/KG	33.00000 J	MG/KG	33.90000 =	MG/KG
I-TOTAL	7440-50-8	Copper							
I-TOTAL	7439-89-6	Iron							
I-TOTAL	7439-92-1	Lead							
I-TOTAL	7439-95-4	Magnesium	5	27.30000 J	MG/KG	11.50000 J	MG/KG	45.30000 J	MG/KG
I-TOTAL	7439-96-5	Manganese							
I-TOTAL	7439-97-6	Mercury							
I-TOTAL	7440-02-0	Nickel	4	0.03000 J	MG/KG	0.04000 J	MG/KG	0.02000 J	MG/KG
I-TOTAL	7440-09-7	Potassium							
I-TOTAL	7782-49-2	Selenium							
I-TOTAL	7440-22-4	Silver	2	1.90000 JU	MG/KG	0.48000 J	MG/KG	0.20000 JU	MG/KG
I-TOTAL	7440-23-5	Sodium	3	1.00000 J	MG/KG	1.90000 J	MG/KG	0.75000 U	MG/KG
I-TOTAL	7440-28-0	Thallium							
I-TOTAL	7440-62-2	Vanadium							
I-TOTAL	7440-66-6	Zinc							
I-TOTAL	CS	Cesium							
I-TOTAL	SR	Strontium							
I-TOTAL	MO	Molybdenum							
BNA									
BNA		BNA'S							
BNA	108-95-2	Phenol							
BNA	111-44-4	bis(2-Chloroethyl)ether		350.00000U	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	95-57-8	2-Chlorophenol							
BNA	541-73-1	1,3-Dichlorobenzene		350.00000U	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	106-46-7	1,4-Dichlorobenzene							
BNA	100-51-6	Benzyl alcohol		350.00000U	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	95-50-1	1,2-Dichlorobenzene							
BNA	95-48-7	2-Methylphenol							
BNA	108-60-1	2,2'-oxybis(1-Chloropropane)							
BNA	106-44-5	4-Methylphenol							
BNA	621-64-7	N-Nitroso-di-n-propylamine							
				350.00000U	UG/KG	460.00000U	UG/KG		

OROVILLE LANDFILL (6/12/92)
All Waste Samples full data set
Full Data Listing: REPORTS\ALLWS2L1 (1 of 1)
Executed: 01/27/93 – 10:41
Samples : 1–5 of 5 Total

RPTFORM	CAS_NO	COMPOUND	N_HITS	V1	Q1	V2	Q2	V3	Q3
		SAMPLE ID:		92-WW-D1		92-WW-D2		92-WW-P1	
BNA	67-72-1	Hexachloroethane							
BNA	98-95-3	Nitrobenzene							
BNA	78-59-1	Isophorone							
BNA	88-75-5	2-Nitrophenol							
BNA	105-67-9	2,4-Dimethylphenol							
BNA	111-91-1	bis(2-Chloroethoxy)methane							
BNA	120-83-2	2,4-Dichlorophenol							
BNA	65-85-0	Benzoic acid							
BNA	120-82-1	1,2,4-Trichlorobenzene		350.00000U	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	91-20-3	Naphthalene		350.00000U	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	106-47-8	4-Chloroaniline							
BNA	87-68-3	Hexachlorobutadiene							
BNA	59-50-7	4-Chloro-3-methylphenol		350.00000U	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	91-57-6	2-Methylnaphthalene							
BNA	77-47-4	Hexachlorocyclopentadiene							
BNA	88-06-2	2,4,6-Trichlorophenol							
BNA	95-95-4	2,4,5-Trichlorophenol							
BNA	91-58-7	2-Chloronaphthalene							
BNA	88-74-4	2-Nitroaniline							
BNA	131-11-3	Dimethylphthalate							
BNA	208-96-8	Acenaphthylene		350.00000JU	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	606-20-2	2,6-Dinitrotoluene							
BNA	99-09-2	3-Nitroaniline							
BNA	83-32-9	Acenapthene		350.00000JU	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	51-28-5	2,4-Dinitrophenol							
BNA	100-02-7	4-Nitrophenol		1800.00000JU	UG/KG	2300.00000U	UG/KG	1800.00000U	UG/KG
BNA	132-64-9	Dibenzofuran							
BNA	121-14-2	2,4-Dinitrotoluene		350.00000JU	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	84-66-2	Diethylphthalate							
BNA	7005-72-3	4-Chlorophenyl-phenylether							
BNA	86-73-7	Fluorene		350.00000JU	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	100-01-6	4-Nitroaniline							
BNA	534-52-1	4,6-Dinitro-2-methylphenol							
BNA	86-30-6	N-Nitrosodiphenylamine							
BNA	101-55-3	4-Bromophenyl-phenylether							
BNA	118-74-1	Hexachlorobenzene							
BNA	87-86-5	Pentachlorophenol		1800.00000JU	UG/KG	2300.00000U	UG/KG	1800.00000U	UG/KG
BNA	85-01-8	Phenanthrene		350.00000JU	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	120-12-7	Anthracene		350.00000JU	UG/KG	460.00000U	UG/KG	370.00000U	UG/KG
BNA	86-74-8	Carbazole							

OROVILLE LANDFILL (6/12/92)
All Waste Samples full data set
Full Data Listing: REPORTS\ALLWS2L1 (1 of 1)
Executed: 01/27/93 - 10:41
Samples : 1-5 of 5 Total

RPTFORM	CAS_NO	COMPOUND	N_HITS	SAMPLE ID:	V1	Q1	V2	Q2	V3	Q3
					92-WW-D1		92-WW-D2		92-WW-P1	
BNA	84-74-2	Di-n-butylphthalate								
BNA	206-44-0	Fluoranthene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	129-00-0	Pyrene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	85-68-7	Butylbenzylphthalate								
BNA	91-94-1	3,3'-Dichlorobenzidine								
BNA	56-55-3	Benzo(a)anthracene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	218-01-9	Chrysene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	117-81-7	bis(2-Ethylhexyl)phthalate								
BNA	117-84-0	Di-n-octylphthalate								
BNA	205-99-2	Benzo(b)fluoranthene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	207-08-9	Benzo(k)fluoranthene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	50-32-8	Benzo(a)pyrene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	193-39-5	Indeno(1,2,3-cd)pyrene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	53-70-3	Dibenz(a,h)anthracene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	191-24-2	Benzo(g,h,i)perylene			350.00000	JU UG/KG	460.00000	U UG/KG	370.00000	U UG/KG
BNA	1319773	Methylphenol								
BNA	ANILINE	Aniline								
VOC										
VOC		VOC'S								
VOC	74-87-3	Chloromethane			11.00000	U UG/KG	12.00000	U UG/KG	11.00000	U UG/KG
VOC	74-83-9	Bromomethane			11.00000	U UG/KG	12.00000	U UG/KG	11.00000	U UG/KG
VOC	75-01-4	Vinyl Chloride			11.00000	U UG/KG	12.00000	U UG/KG	11.00000	U UG/KG
VOC	75-00-3	Chloroethane			11.00000	U UG/KG	12.00000	U UG/KG	11.00000	U UG/KG
VOC	75-09-2	Methylene Chloride			27.00000	BJU UG/KG	11.00000	BJU UG/KG	19.00000	BJU UG/KG
VOC	67-64-1	Acetone	1		39.00000	BJU UG/KG	35.00000	= UG/KG	45.00000	BJU UG/KG
VOC	75-15-0	Carbon Disulfide			5.00000	U UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	75-35-4	1,1-Dichloroethene			5.00000	U UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	75-34-3	1,1-Dichloroethane			5.00000	U UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	540-59-0	1,2-Dichloroethene (total)			5.00000	U UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	67-66-3	Chloroform			5.00000	U UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	107-06-2	1,2-Dichloroethane			5.00000	U UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	78-93-3	2-Butanone			11.00000	U UG/KG	12.00000	U UG/KG	11.00000	U UG/KG
VOC	71-55-6	1,1,1-Trichloroethane			5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	56-23-5	Carbon Tetrachloride			5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	75-27-4	Bromodichloromethane			5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	78-87-5	1,2-Dichloropropane			5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	10061-01-5	cis-1,3-Dichloropropene			5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	79-01-6	Trichloroethene			5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	124-48-1	Dibromochloromethane			5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	79-00-5	1,1,2-Trichloroethane			5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG

OROVILLE LANDFILL (6/12/92)
All Waste Samples full data set
Full Data Listing: REPORTS\ALLWS2L1 (1 of 1)
Executed: 01/27/93 – 10:41
Samples : 1–5 of 5 Total

RPTFORM	CAS_NO	COMPOUND	N_HITS	V1	Q1	V2	Q2	V3	Q3
		SAMPLE ID:		92-WW-D1		92-WW-D2		92-WW-P1	
VOC	71-43-2	Benzene		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	10061-02-6	Trans-1,3-Dichloropropene		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	75-25-2	Bromoform		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	108-10-1	4-Methyl-2-Pentanone		11.00000	JU UG/KG	12.00000	U UG/KG	11.00000	U UG/KG
VOC	591-78-6	2-Hexanone		11.00000	JU UG/KG	12.00000	U UG/KG	11.00000	U UG/KG
VOC	127-18-4	Tetrachloroethene		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	79-34-5	1,1,2,2-Tetrachloroethane		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	108-88-3	Toluene		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	108-90-7	Chlorobenzene		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	100-41-4	Ethylbenzene		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	100-42-5	Styrene		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	1330-20-7	Xylenes (total)		5.00000	JU UG/KG	6.00000	U UG/KG	6.00000	U UG/KG
VOC	108-05-4	Vinyl Acetate							
VOC	156-60-5	Trans-1,2-Dichloroethene							
PEST/PCB	115322	DICOFOL							
PEST/PCB	786196	CARBOPHENOTHION (Trithion)							
PEST/PCB									
PEST/PCB		PESTICIDES/PCB							
PEST/PCB	319-84-6	alpha-BHC							
PEST/PCB	319-85-7	beta-BHC							
PEST/PCB	319-86-8	delta-BHC							
PEST/PCB	58-89-9	gamma-BHC (Lindane)							
PEST/PCB	76-44-8	Heptachlor							
PEST/PCB	309-00-2	Aldrin							
PEST/PCB	1024-57-3	Heptachlor epoxide	1						
PEST/PCB	959-98-8	Endosulfan I	1						
PEST/PCB	60-57-1	Dieldrin	1						
PEST/PCB	72-55-9	4,4'-DDE	1						
PEST/PCB	72-20-8	Endrin	1						
PEST/PCB	33213-65-9	Endosulfan II	1						
PEST/PCB	72-54-8	4,4'-DDD							
PEST/PCB	1031-07-8	Endosulfan sulfate							
PEST/PCB	50-29-3	4,4'-DDT	1						
PEST/PCB	72-43-5	Methoxychlor							
PEST/PCB	53494-70-5	Endrin ketone							
PEST/PCB	5103-71-9	alpha-Chlordane							
PEST/PCB	7421-36-3	Endrin Aldehyde							
PEST/PCB	5103-74-2	gamma-Chlordane							
PEST/PCB	8001-35-2	Toxaphene							
PEST/PCB	12674-11-2	Aroclor-1016							

RPTFORM	CAS_NO	COMPOUND OROVILLE LANDFILL (6/12/92) All Waste Samples full data set Full Data Listing: REPORTS\ALLWS2L1 (1 of 1) Executed: 01/27/93 – 10:41 Samples : 1–5 of 5 Total	N_HITS	V1	Q1	V2	Q2	V3	Q3
		SAMPLE ID:		92-WW-D1		92-WW-D2		92-WW-P1	
PEST/PCB	11104-28-2	Aroclor-1221							
PEST/PCB	11141-16-5	Aroclor-1232							
PEST/PCB	53469-21-9	Aroclor-1242							
PEST/PCB	12672-29-6	Arochlor-1248							
PEST/PCB	11097-69-1	Aroclor-1254							
PEST/PCB	11096-82-5	Arochlor-1260							
PEST/PCB	12789036	CHLORDANE							
PEST/PCB	133062	CAPTAN							
PEST/PCB	1582098	TRIFLURALIN							
PEST/PCB	2385855	MIREX							
PEST/PCB	465763	ISODRIN							
PEST/PCB	DICHLORAN	DICHLORAN							
PEST/PCB	PCNB	PCNB							
PEST/PCB	PERTANE	PERTHANE							
PEST/PCB	STROBANE	STROBANE							
TCLPPEST									
TCLPPEST		*TCLP PESTICIDE/HERBICIDE							
TCLPPEST	94-75-7	2,4-D		5.00000	U UG/L	1.00000	U UG/L	5.00000	U UG/L
TCLPPEST	93-72-1	2,4,5-TP (SILVEX)		1.00000	U UG/L	0.20000	U UG/L	1.00000	U UG/L
TCLPPEST	76-44-8	Heptachlor		2.50000	U UG/L	0.50000	U UG/L	0.10000	U UG/L
TCLPPEST	1024-57-3	Heptachlor Epoxide		2.50000	U UG/L	0.50000	U UG/L	0.10000	U UG/L
TCLPPEST	5103-71-9	alpha-Chlordane		5.00000	U UG/L	1.00000	U UG/L	0.20000	U UG/L
TCLPPEST	5103-74-2	gamma-Chlordane		5.00000	U UG/L	1.00000	U UG/L	0.20000	U UG/L
TCLPPEST	58-89-9	gamma-BHC (Lindane)		2.50000	U UG/L	0.50000	U UG/L	0.10000	U UG/L
TCLPPEST	72-20-8	Endrin	1	5.00000	U UG/L	1.00000	U UG/L	0.20000	U UG/L
TCLPPEST	72-43-5	Methoxychlor		25.00000	U UG/L	5.00000	U UG/L	1.00000	U UG/L
TCLPPEST	8001-35-2	Toxaphene		50.00000	U UG/L	10.00000	U UG/L	2.00000	U UG/L
TOX									
TOX		TOTAL ORGANIC HALOGEN							
TOX	ITOX	TOTAL ORGANIC HALOGEN	5	1930.00000	BJ MG/KG	851.00000	BJ MG/KG	419.00000	BJ MG/KG

OROVILLE LANDFILL (6/12/92)
All Waste Samples full data set
Full Data Listing: REPORTS\ALLWS2L1 (1 of 1)
Executed: 01/27/93 – 10:41
Samples : 1–5 of 5 Total

RPTFORM	CAS_NO	COMPOUND	N_HITS	V4	Q4	V5	Q5
		SAMPLE ID:		92-WW-P2 Waste Soil Pile (ETHION)		GW-WWT-92 Wastewater (DECON TANK)	
I-TOTAL		INORGANICS (TOTAL)					
I-TOTAL	7429-90-5	Aluminum	5	25.90000 =	MG/KG	37.20000 J	UG/L
I-TOTAL	7440-36-0	Antimony	5	102.00000=	MG/KG	447.00000=	UG/L
I-TOTAL	7440-38-2	Arsenic	3	0.41000 U	MG/KG	6.10000 =	UG/L
I-TOTAL	7440-39-3	Barium	5	32.80000 =	MG/KG	68.50000 =	UG/L
I-TOTAL	7440-41-7	Beryllium					
I-TOTAL	7440-43-9	Cadmium					
I-TOTAL	7440-70-2	Calcium					
I-TOTAL	7440-47-3	Chromium					
I-TOTAL	7440-48-4	Cobalt					
I-TOTAL	7440-50-8	Copper					
I-TOTAL	7439-89-6	Iron	5	222.00000J	MG/KG	84.60000 =	UG/L
I-TOTAL	7439-92-1	Lead					
I-TOTAL	7439-95-4	Magnesium					
I-TOTAL	7439-96-5	Manganese	4	0.02000 J	MG/KG	0.20000 JU	UG/L
I-TOTAL	7439-97-6	Mercury					
I-TOTAL	7440-02-0	Nickel					
I-TOTAL	7440-09-7	Potassium					
I-TOTAL	7782-49-2	Selenium	2	2.00000 JU	MG/KG	9.00000	UG/L
I-TOTAL	7440-22-4	Silver	3	0.96000 J	MG/KG	3.40000 U	UG/L
I-TOTAL	7440-23-5	Sodium					
I-TOTAL	7440-28-0	Thallium					
I-TOTAL	7440-62-2	Vanadium					
I-TOTAL	7440-66-6	Zinc					
I-TOTAL	CS	Cesium					
I-TOTAL	SR	Strontium					
I-TOTAL	MO	Molybdenum					
BNA							
BNA		BNA'S					
BNA	108-95-2	Phenol		380.00000U	UG/KG	10.00000 U	UG/L
BNA	111-44-4	bis(2-Chloroethyl)ether		380.00000U	UG/KG	10.00000 U	UG/L
BNA	95-57-8	2-Chlorophenol		380.00000U	UG/KG	10.00000 U	UG/L
BNA	541-73-1	1,3-Dichlorobenzene					
BNA	106-46-7	1,4-Dichlorobenzene					
BNA	100-51-6	Benzyl alcohol					
BNA	95-50-1	1,2-Dichlorobenzene					
BNA	95-48-7	2-Methylphenol					
BNA	108-60-1	2,2'-oxybis(1-Chloropropane)					
BNA	106-44-5	4-Methylphenol					
BNA	621-64-7	N-Nitroso-di-n-propylamine		380.00000U	UG/KG	10.00000 U	UG/L

OROVILLE LANDFILL (6/12/92)
All Waste Samples full data set
Full Data Listing: REPORTS\ALLWS2L1 (1 of 1)
Executed: 01/27/93 - 10:41
Samples : 1-6 of 5 Total

RPTFORM	CAS_NO	COMPOUND	N_HITS	V4	Q4	V5	Q5
		SAMPLE ID:		92-WW-P2		GW-WWT-92	
BNA	67-72-1	Hexachloroethane					
BNA	98-95-3	Nitrobenzene					
BNA	78-59-1	Isophorone					
BNA	88-75-5	2-Nitrophenol					
BNA	105-67-9	2,4-Dimethylphenol					
BNA	111-91-1	bis(2-Chloroethoxy)methane					
BNA	120-83-2	2,4-Dichlorophenol					
BNA	65-85-0	Benzoic acid					
BNA	120-82-1	1,2,4-Trichlorobenzene		380.00000	U UG/KG	10.00000	U UG/L
BNA	91-20-3	Naphthalene		380.00000	U UG/KG	10.00000	U UG/L
BNA	106-47-8	4-Chloroaniline					
BNA	87-68-3	Hexachlorobutadiene					
BNA	59-50-7	4-Chloro-3-methylphenol		380.00000	U UG/KG	10.00000	U UG/L
BNA	91-57-6	2-Methylnaphthalene					
BNA	77-47-4	Hexachlorocyclopentadiene					
BNA	88-06-2	2,4,6-Trichlorophenol					
BNA	95-95-4	2,4,5-Trichlorophenol					
BNA	91-58-7	2-Chloronaphthalene					
BNA	88-74-4	2-Nitroaniline					
BNA	131-11-3	Dimethylphthalate					
BNA	208-96-8	Acenaphthylene		380.00000	U UG/KG	10.00000	U UG/L
BNA	606-20-2	2,6-Dinitrotoluene					
BNA	99-09-2	3-Nitroaniline					
BNA	83-32-9	Acenapthene		380.00000	U UG/KG	10.00000	U UG/L
BNA	51-28-5	2,4-Dinitrophenol					
BNA	100-02-7	4-Nitrophenol		1900.0000	U UG/KG	50.00000	U UG/L
BNA	132-64-9	Dibenzofuran					
BNA	121-14-2	2,4-Dinitrotoluene		380.00000	U UG/KG	10.00000	U UG/L
BNA	84-66-2	Diethylphthalate					
BNA	7005-72-3	4-Chlorophenyl-phenylether					
BNA	86-73-7	Fluorene		380.00000	U UG/KG	10.00000	U UG/L
BNA	100-01-6	4-Nitroaniline					
BNA	534-52-1	4,6-Dinitro-2-methylphenol					
BNA	86-30-6	N-Nitrosodiphenylamine					
BNA	101-55-3	4-Bromophenyl-phenylether					
BNA	118-74-1	Hexachlorobenzene					
BNA	87-86-5	Pentachlorophenol		1900.0000	U UG/KG	50.00000	U UG/L
BNA	85-01-8	Phenanthrene		380.00000	U UG/KG	10.00000	U UG/L
BNA	120-12-7	Anthracene		380.00000	U UG/KG	10.00000	U UG/L
BNA	86-74-8	Carbazole					

OROVILLE LANDFILL (6/12/92)
All Waste Samples full data set
Full Data Listing: REPORTS\ALLWS2L1 (1 of 1)
Executed: 01/27/93 - 10:41
Samples : 1-5 of 5 Total

RPTFORM	CAS_NO	COMPOUND	N_HITS	V4	Q4	V5	Q5
		SAMPLE ID:		92-WW-P2		GW-WWT-92	
BNA	84-74-2	Di-n-butylphthalate					
BNA	206-44-0	Fluoranthene		380.00000	U UG/KG	10.00000	U UG/L
BNA	129-00-0	Pyrene		380.00000	U UG/KG	10.00000	U UG/L
BNA	85-68-7	Butylbenzylphthalate					
BNA	91-94-1	3,3'-Dichlorobenzidine					
BNA	56-55-3	Benzo(a)anthracene		380.00000	U UG/KG	10.00000	U UG/L
BNA	218-01-9	Chrysene		380.00000	U UG/KG	10.00000	U UG/L
BNA	117-81-7	bis(2-Ethylhexyl)phthalate					
BNA	117-84-0	Di-n-octylphthalate					
BNA	205-99-2	Benzo(b)fluoranthene		380.00000	U UG/KG	10.00000	U UG/L
BNA	207-08-9	Benzo(k)fluoranthene		380.00000	U UG/KG	10.00000	U UG/L
BNA	50-32-8	Benzo(a)pyrene		380.00000	U UG/KG	10.00000	U UG/L
BNA	193-39-5	Indeno(1,2,3-cd)pyrene		380.00000	U UG/KG	10.00000	U UG/L
BNA	53-70-3	Dibenz(a,h)anthracene		380.00000	U UG/KG	10.00000	U UG/L
BNA	191-24-2	Benzo(g,h,i)perylene		380.00000	U UG/KG	10.00000	U UG/L
BNA	1319773	Methylphenol					
BNA	ANILINE	Aniline					
VOC							
VOC		VOC'S					
VOC	74-87-3	Chloromethane		12.00000	U UG/KG	10.00000	U UG/L
VOC	74-83-9	Bromomethane		12.00000	U UG/KG	10.00000	U UG/L
VOC	75-01-4	Vinyl Chloride		12.00000	U UG/KG	10.00000	U UG/L
VOC	75-00-3	Chloroethane		12.00000	U UG/KG	10.00000	U UG/L
VOC	75-09-2	Methylene Chloride		17.00000	BJU UG/KG	5.00000	U UG/L
VOC	67-64-1	Acetone	1	25.00000	BJU UG/KG	10.00000	U UG/L
VOC	75-15-0	Carbon Disulfide		6.00000	U UG/KG	5.00000	U UG/L
VOC	75-35-4	1,1-Dichloroethene		6.00000	U UG/KG	5.00000	U UG/L
VOC	75-34-3	1,1-Dichloroethane		6.00000	U UG/KG	5.00000	U UG/L
VOC	540-59-0	1,2-Dichloroethene (total)		6.00000	U UG/KG	5.00000	U UG/L
VOC	67-66-3	Chloroform		6.00000	U UG/KG	5.00000	U UG/L
VOC	107-06-2	1,2-Dichloroethane		6.00000	U UG/KG	5.00000	U UG/L
VOC	78-93-3	2-Butanone		12.00000	U UG/KG	10.00000	U UG/L
VOC	71-55-6	1,1,1-Trichloroethane		6.00000	U UG/KG	5.00000	U UG/L
VOC	56-23-5	Carbon Tetrachloride		6.00000	U UG/KG	5.00000	U UG/L
VOC	75-27-4	Bromodichloromethane		6.00000	U UG/KG	5.00000	U UG/L
VOC	78-87-5	1,2-Dichloropropane		6.00000	U UG/KG	5.00000	U UG/L
VOC	10061-01-5	cis-1,3-Dichloropropene		6.00000	U UG/KG	5.00000	U UG/L
VOC	79-01-6	Trichloroethene		6.00000	U UG/KG	5.00000	U UG/L
VOC	124-48-1	Dibromochloromethane		6.00000	U UG/KG	5.00000	U UG/L
VOC	79-00-5	1,1,2-Trichloroethane		6.00000	U UG/KG	5.00000	U UG/L

OROVILLE LANDFILL (6/12/92)
All Waste Samples full data set
Full Data Listing: REPORTS\ALLWS2L1 (1 of 1)
Executed: 01/27/93– 10:41
Samples : 1–5 of 5 Total

RPTFORM	CAS_NO	COMPOUND	N_HITS	V4	Q4	V5	Q5
		SAMPLE ID:		92-WW-P2		GW-WWT-92	
VOC	71-43-2	Benzene		6.00000	U UG/KG	5.00000	U UG/L
VOC	10061-02-6	Trans-1,3-Dichloropropene		6.00000	U UG/KG	5.00000	U UG/L
VOC	75-25-2	Bromoform		6.00000	U UG/KG	5.00000	U UG/L
VOC	108-10-1	4-Methyl-2-Pentanone		12.00000	U UG/KG	10.00000	U UG/L
VOC	591-78-6	2-Hexanone		12.00000	U UG/KG	10.00000	U UG/L
VOC	127-18-4	Tetrachloroethene		6.00000	U UG/KG	5.00000	U UG/L
VOC	79-34-5	1,1,2,2-Tetrachloroethane		6.00000	U UG/KG	5.00000	U UG/L
VOC	108-88-3	Toluene		6.00000	U UG/KG	5.00000	U UG/L
VOC	108-90-7	Chlorobenzene		6.00000	U UG/KG	5.00000	U UG/L
VOC	100-41-4	Ethylbenzene		6.00000	U UG/KG	5.00000	U UG/L
VOC	100-42-5	Styrene		6.00000	U UG/KG	5.00000	U UG/L
VOC	1330-20-7	Xylenes (total)		6.00000	U UG/KG	5.00000	U UG/L
VOC	108-05-4	Vinyl Acetate					
VOC	156-60-5	Trans-1,2-Dichloroethene					
PEST/PCB	115322	DICOFOL					
PEST/PCB	786196	CARBOPHENOTHION (Trithion)					
PEST/PCB							
PEST/PCB		PESTICIDES/PCB					
PEST/PCB	319-84-6	alpha-BHC				0.05000	JU UG/L
PEST/PCB	319-85-7	beta-BHC				0.05000	BJU UG/L
PEST/PCB	319-86-8	delta-BHC				0.05000	JU UG/L
PEST/PCB	58-89-9	gamma-BHC (Lindane)				0.05000	JU UG/L
PEST/PCB	76-44-8	Heptachlor				0.05000	JU UG/L
PEST/PCB	309-00-2	Aldrin				0.05000	JU UG/L
PEST/PCB	1024-57-3	Heptachlor epoxide	1			0.02000	J UG/L
PEST/PCB	959-98-8	Endosulfan I	1			0.03000	J UG/L
PEST/PCB	60-57-1	Dieldrin	1			2.10000	J UG/L
PEST/PCB	72-55-9	4,4'-DDE	1			0.51000	J UG/L
PEST/PCB	72-20-8	Endrin	1			0.07100	J UG/L
PEST/PCB	33213-65-9	Endosulfan II	1			0.62000	J UG/L
PEST/PCB	72-54-8	4,4'-DDD				0.17000	BJU UG/L
PEST/PCB	1031-07-8	Endosulfan sulfate				0.10000	JU UG/L
PEST/PCB	50-29-3	4,4'-DDT	1			0.73000	BJ UG/L
PEST/PCB	72-43-5	Methoxychlor				0.50000	JU UG/L
PEST/PCB	53494-70-5	Endrin ketone				0.10000	JU UG/L
PEST/PCB	5103-71-9	alpha-Chlordane				0.05000	JU UG/L
PEST/PCB	7421-36-3	Endrin Aldehyde				0.10000	JU UG/L
PEST/PCB	5103-74-2	gamma-Chlordane				0.05000	JU UG/L
PEST/PCB	8001-35-2	Toxaphene				5.00000	JU UG/L
PEST/PCB	12674-11-2	Aroclor-1016				1.00000	JU UG/L

OROVILLE LANDFILL (6/12/92)
All Waste Samples full data set
Full Data Listing: REPORTS\ALLWS2L1 (1 of 1)
Executed: 01/27/93– 10:41
Samples : 1–6 of 5 Total

RPTFORM	CAS_NO	COMPOUND	N_HITS	V4	Q4	V5	Q5
		SAMPLE ID:		92-WW-P2		GW-WWT-92	
PEST/PCB	11104-28-2	Aroclor-1221				2.00000	JU UG/L
PEST/PCB	11141-16-5	Aroclor-1232				1.00000	JU UG/L
PEST/PCB	53469-21-9	Aroclor-1242				1.00000	JU UG/L
PEST/PCB	12672-29-6	Arochlor-1248				1.00000	JU UG/L
PEST/PCB	11097-69-1	Aroclor-1254				1.00000	JU UG/L
PEST/PCB	11096-82-5	Arochlor-1260				1.00000	JU UG/L
PEST/PCB	12789036	CHLORDANE					
PEST/PCB	133062	CAPTAN					
PEST/PCB	1582098	TRIFLURALIN					
PEST/PCB	2385855	MIREX					
PEST/PCB	465763	ISODRIN					
PEST/PCB	DICHLORAN	DICHLORAN					
PEST/PCB	PCNB	PCNB					
PEST/PCB	PERTANE	PERTHANE					
PEST/PCB	STROBANE	STROBANE					
TCLPPEST							
TCLPPEST		*TCLP PESTICIDE/HERBICIDE					
TCLPPEST	94-75-7	2,4-D		5.00000	U UG/L		
TCLPPEST	93-72-1	2,4,5-TP (SILVEX)		1.00000	U UG/L		
TCLPPEST	76-44-8	Heptachlor		0.05000	U UG/L		
TCLPPEST	1024-57-3	Heptachlor Epoxide		0.05000	U UG/L		
TCLPPEST	5103-71-9	alpha-Chlordane		0.10000	U UG/L		
TCLPPEST	5103-74-2	gamma-Chlordane		0.10000	U UG/L		
TCLPPEST	58-89-9	gamma-BHC (Lindane)		0.05000	U UG/L		
TCLPPEST	72-20-8	Endrin	1	0.08000	J UG/L		
TCLPPEST	72-43-5	Methoxychlor		0.50000	U UG/L		
TCLPPEST	8001-35-2	Toxaphene		1.00000	U UG/L		
TOX							
TOX		TOTAL ORGANIC HALOGEN					
TOX	ITOX	TOTAL ORGANIC HALOGEN	5	274.00000	BJ MG/KG	0.13000	J MG/L

APPENDIX D
SECTION 3.2.3

Samples Representing Pesticide Debris Trench Hot Spot

Includes Samples:

92-SS-11 SI-2N-2W

This query represents the extent of contamination associated with the pesticide debris trench. Samples 92-SS-11 and SI-2N-2W were utilized in this query. 92-SS-11 is a 1992 composite sample taken from several points within the pesticide trench area. S1-2N-2W, sampled in the Site Investigation, is slightly outside of the trench proper, but is within the area of impact of the trench. This historical sample was used over other historical samples because it possessed quantitation limits for non-detected analytes. The other possible data point for this query, OTSS-1, a historical sample also from the Site Inspection, did not possess quantification limits for the non-detected analytes.

BLM ORVILLE LANDFILL
PESTICIDE DEBRIS TRENCH HOT SPOT
Samples : 1 - 2 of 2 Total

SAMPLE ID:	Number of Hits	92-SS-11		SI-2N-2W	
1,2,4-TRICHLOROBENZENE	1	0.06400	J mg/kg.		
PHENOXY HERBICIDES					
2,4,5-TP (SILVEX)	1	0.16000	J mg/kg.		
2,4,5-T	1	0.19000	= mg/kg.		
2,4-D	1	0.06100	= mg/kg.		
2,4-DB	1	0.18000	= mg/kg.		
ORGANOPHOSPHATE PESTICIDES					
M. PARATHION	1	0.04900	J mg/kg.		
Ethion	1	49.00000	J mg/kg.		
AZINPHOS METHYL	1	0.74000	= mg/kg.		
TPH-HYDR.CARB ID (PURGE)					
Extract Petroleum Hydrocarbons	1	82.00000	mg/kg		
Total Extractable Hydrocarbons	1	82.00000	mg/kg		
VOC'S					
Carbon Disulfide	1	0.00800	= mg/kg.		
BNA'S					
4-Nitrophenol	1	1.10000	J mg/kg.		
Fluoranthene	1	0.09800	J mg/kg.		
4-Chloro-3-methylphenol	1	0.10000	J mg/kg.		
N-Nitroso-di-n-propylamine	1	0.04100	J mg/kg.		
Di-n-butylphthalate	1	0.07200	J mg/kg.		
Phenanthrene	1	0.06200	J mg/kg.		
Butylbenzylphthalate	1	0.50000	J mg/kg.		
2-Chlorophenol	1	0.06900	J mg/kg.		
PESTICIDES/PCB					
alpha-BHC	1	0.04000	J mg/kg.	0.00005	U mg/kg.
beta-BHC	1	0.06700	J mg/kg.	0.00005	U mg/kg.
Endosulfan I	2	26.00000	mg/kg.	0.03600	J mg/kg.
Dieldrin	1	0.05500	J mg/kg.	0.00010	U mg/kg.
4,4'-DDE	2	4.00000	mg/kg.	0.94000	mg/kg.
Endrin	1	0.90000	J mg/kg.	0.00010	U mg/kg.
Endosulfan II	2	18.00000	J mg/kg.	0.05000	J mg/kg.
4,4'-DDD	1	11.00000	J mg/kg.	0.00010	U mg/kg.
Endosulfan sulfate	1	0.54000	mg/kg.	0.00010	U mg/kg.
4,4'-DDT	2	45.00000	BJ mg/kg.	1.50000	mg/kg.
Methoxychlor	1	0.97000	J mg/kg.	0.00050	U mg/kg.
Endrin ketone	1	0.21000	J mg/kg.	0.00010	U mg/kg.
CONV. WATER PARAM.					
Total Organic Carbon	1	1.30000	%		

BLM ORVILLE LANDFILL
PESTICIDE DEBRIS TRENCH HOT SPOT
Samples : 1–2 of 2 Total

SAMPLE ID:	Number of Hits	92–SS–11		SI–2N–2W
CATION EXCHANGE CAP.				
Cation Exchange Capacity	1	46.70000		meq/100g
INORGANICS (TOTAL)				
Lead	1	13.30000	J	mg/kg
Mercury	1	0.04000	J	mg/kg
Silver	1	0.83000	J	mg/kg
Arsenic	1	7.40000	J	mg/kg
Barium	1	115.00000		mg/kg
Cadmium	1	1.30000		mg/kg
Chromium	1	25.70000	J	mg/kg
Selenium	1	0.55000	J	mg/kg

US DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT

Spokane District Office
1103 North Fancher Rd.
Spokane, WA 99212

In reply refer to:
1703 ORZA (OR-130)

DETERMINATION OF LANDFILL CAP BOUNDARY USING DDT FIELD LAB ANALYSIS

OROVILLE LANDFILL, OROVILLE WA

Summary:

In May, 1996, Spokane District and BLM National Applied Resources Center (NARSC) personnel sampled surface soils around a pesticide disposal trench at the Oroville Landfill to better define the limits of DDT contamination prior to placement of the containment cap. The samples were analyzed on site using a field laboratory kit. The results were used to ensure that areas demonstrating contamination levels over 1 mg/kg would be covered by the cap. The cap boundary was then staked in preparation for construction scheduled for July, 1996.

Introduction:

Prior environmental investigation at the Oroville Landfill includes an Expanded Site Investigation and a Remedial Investigation/Feasibility Study, conducted from 1989 to 1994. The results of these efforts determined the location of a pesticide disposal trench constructed in 1969 to contain fire debris from an agricultural warehouse fire in Oroville, WA.

During compliance monitoring work in May, 1995, overland flow of surface soil from bare soil areas at the trench was observed. It was determined this was likely caused the previous winter by the rapid thawing of the top inch or two of frozen, saturated soil. Other adjacent (very small) bare soil areas were also observed raising the speculation that the contamination might extend downslope further than previously thought. It is now believed that soil was borrowed from the area east of the trench and drifted westward and downslope in an effort to cover debris during landfill closure in 1975. The equipment operator may have been unaware of the trench and consequently disturbed some trench surface soil.

BLM's RI/FS contractor returned to the site in October, 1995, to conduct further sampling in an effort to determine the possible extent and level of contamination. This work indeed determined the existence of further downslope

contamination and recommended an expansion of the cap as depicted in Figure 1 (Soil Sampling Results - Proposed Cap Boundary, Oroville Landfill. Roy F. Weston, Inc. January, 1996).

Since that investigation was limited to 12 samples, and because sample station #95-SS-11 (outside the cap) showed an exceedence, it was determined that further sampling might be in order.

Objectives:

The primary objective of the work described below is to further confirm the lateral extent of DDT contaminated surface soil (exceeding 1 mg/kg) related to the former pesticide disposal trench and determine if further expansion of the proposed cap (beyond that described by Weston) is warranted.

Sample Collection:

In two rounds of sampling, fourteen surface soil samples were collected in zip-lock plastic bags from the 0-1 inch interval on May 23 and 24, 1996, by Dr. Karl Ford and Jake Jakabosky. (The first sampling round determined further sampling was required on the southwest side of the cap.) Two ounces of soil were placed in each bag after removing stones and organic matter using disposable plastic spoons. Bags were individually labeled 96-SS-1 through 96-SS-14 using a sharpie pen. Sample locations were staked as shown in Figure 2.

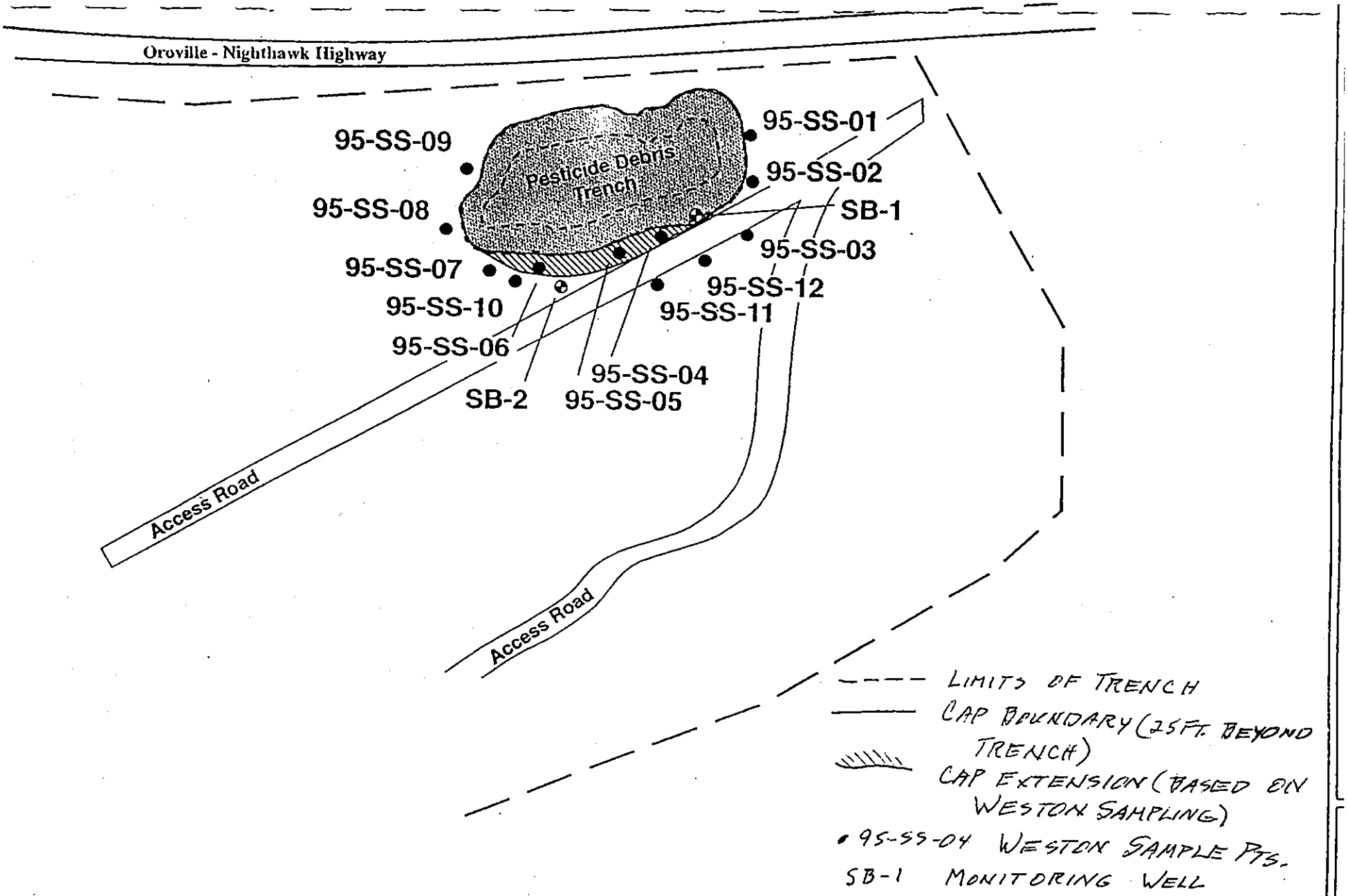
Sample Analysis:

A Millipore Co., portable EnviroGard Soil Field Laboratory, immunoassay, in-Soil Test Kit was used to screen the samples for total DDT in the field. Screening procedures as described in the Millipore directions (see Enclosure) were followed closely. A differential photometer was used to determine the optical density of: 1)the negative control, 2)each of the three positive calibrators (0.2, 1, and 10 ppm DDT), and 3)each of the samples. Concentration of DDT in individual samples was determined by comparing sample optical density to the control and calibrators.

Results:

Table 1 shows the optical density and corresponding DDT concentration by sample. Ten of the 14 samples exceeded the 1 mg/kg concentration level selected. Sample locations and the new expanded cap boundary necessary to cover contaminated soils are shown in Figure 3. The new boundary was staked in the field, surveyed using a Criterion 400 Laser instrument, and later mapped in the office.

The cap construction using a geosynthetic clay liner and two feet of topsoil, was completed in July, 1996. The landfill is to remain fenced and the site monitored for the next 30 years. Further institutional controls will be established in the BLM land records to ensure the cap area is not disturbed in the future.



7-0001
1995

FIGURE 1

0 50 100
Scale in Feet

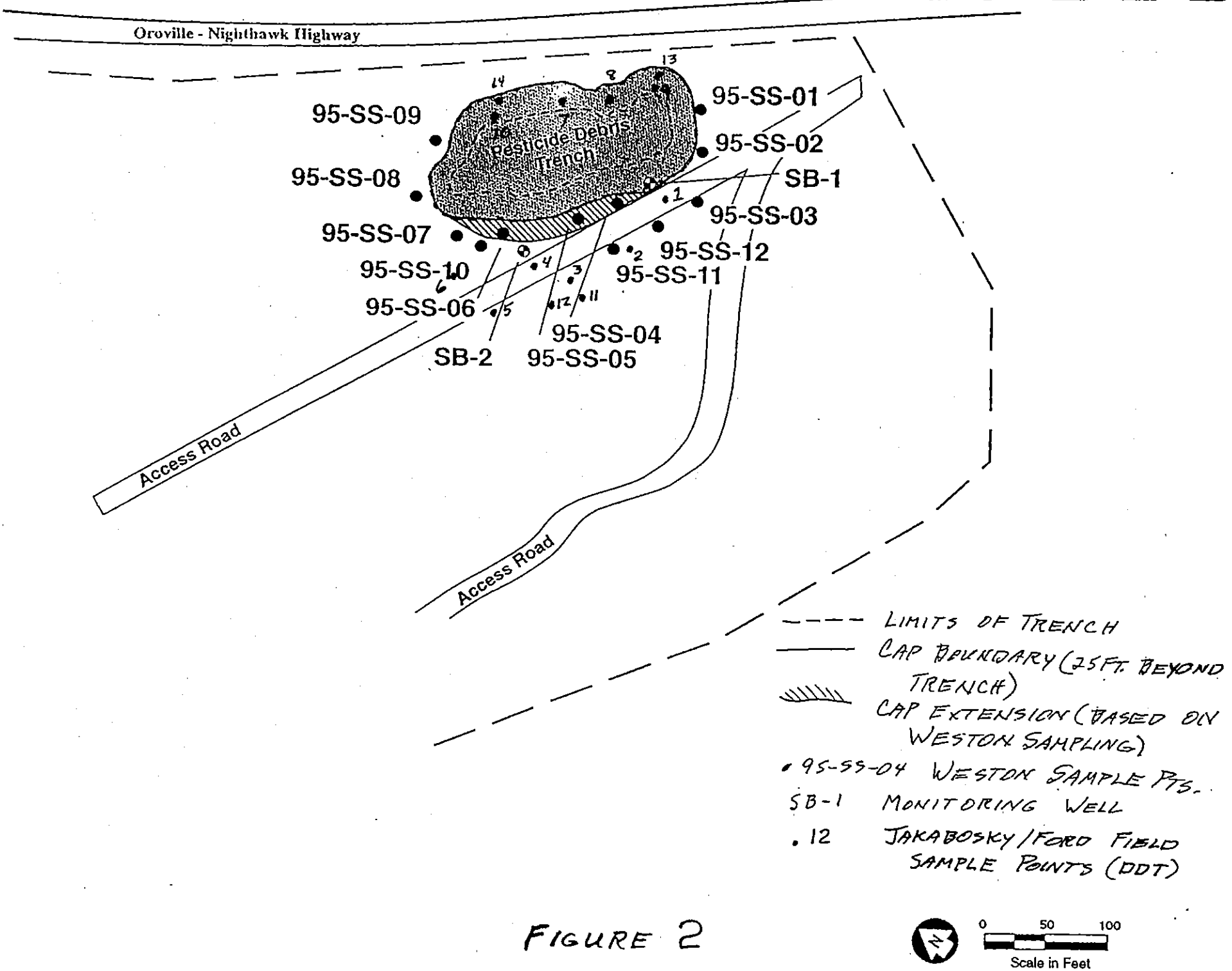


FIGURE 2

0001
995

EnviroGard™ DDT In Soil Test Kit

Data Record/Quality Assurance

Tube[1]	Calibrator/Sample	Optical Density	%Bo[2]	Interpretation/Comment[3]
NC	Negative Control	2.0		Absorbance should be > 0.50
C1	0.2 ppm DDT	1.67	.835	%Bo should be 68 to 88
C2	1 ppm DDT	1.27	.64	%Bo should be 51 to 69
C3	10 ppm DDT	0.94	.47	%Bo should be 31 to 47
S1	96-55-01	1.74		0.1 ppm
S2	-02	1.43		0.6
S4	-03	.95		10.0
S5	-04	1.30		1.0
S6	-05	1.29		1.0
S7	-06	1.20		3.0
S8	-07	1.65		0.2
S9	-08	1.35		0.9
S10	-09	0.93		10.0
S11	-10	0.81		12.0
S12	-11	1.12		5.0
S13	-12	0.89		11.0
S14	-13	1.00		8.0
S15	-14	1.00		8.0
S16				
S17				
S18				

NOTES:

1. The Negative Control and at least one Positive Calibrator must be run with each assay. Use of multiple Positive Calibrators is dependent upon data requirements. Total assay size should not exceed 20 tubes.
2. %Bo is calculated by dividing the optical density (OD) of each Positive Calibrator or Sample by the OD of the Negative Control, and multiplying by 100. This calculation is optional for Samples. Sample interpretation can be made by comparison of either %Bo or OD to the corresponding value found for the Positive Calibrator(s).
3. The conditions stated for the OD of the Negative Control and the %Bo value for any Positive Controls must be met for the assay to yield results which achieve the performance claims. If these parameters fall outside the stated limits, the assay should be repeated. Contact Millipore Technical Service for further information.

Rev. 11/9/95

TABLE 1

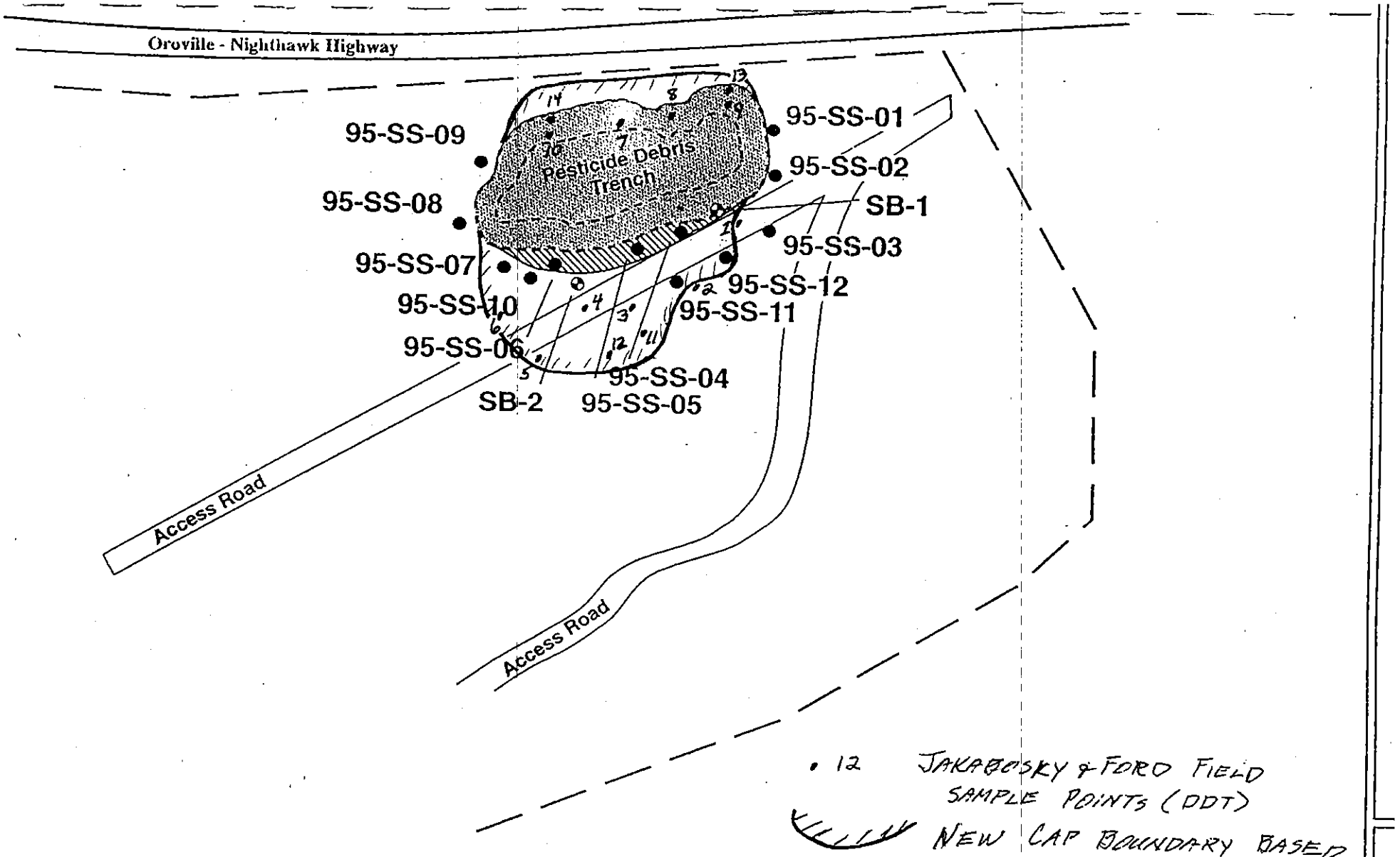

Oroville - Nighthawk Highway
95-SS-09
95-SS-01
95-SS-02
95-SS-08
SB-1
95-SS-07
95-SS-03
95-SS-10
95-SS-12
95-SS-11
95-SS-06
95-SS-04
SB-2
95-SS-05
Pesticide Debris Trench
Access Road
Access Road
• 12 JAKABOSKY & FORD FIELD SAMPLE POINTS (DDT)
NEW CAP BOUNDARY BASED ON FIELD SAMPLING & ANALYSIS (5-24-96)
0
50
100
Scale in Feet

FIGURE 3

MILLIPORE

EnviroGard™ DDT in Soil Test Kit

ENVR 000 31

Intended Use

The EnviroGard DDT in Soil Test Kit is a qualitative or semi-quantitative field test for the detection of DDT and its metabolites DDD and DDE in soil. The EnviroGard DDT in Soil Test Kit allows rapid semi-quantitative screening for DDT at 0.2, 1.0, and 10.0 parts per million (ppm) in soils.

Test Principles

The EnviroGard DDT in Soil Test Kit is based on the use of polyclonal antibodies that bind either DDT or DDT-Enzyme Conjugate. These antibodies are immobilized to the walls of the test tubes. When DDT is present in the sample, it competes with the DDT-Enzyme Conjugate for a limited number of antibody binding sites.

- A sample containing DDT is added to a test tube containing Assay Diluent. DDT-Enzyme Conjugate is then added to the test tube. The DDT-Enzyme Conjugate competes with the DDT for the antibody binding sites.
- After the incubation, the unbound molecules are washed away.
- A clear solution of chromogenic Substrate is then added to the test tube. In the presence of bound DDT-Enzyme Conjugate, the clear Substrate is converted to a blue color. One enzyme molecule can convert many Substrate molecules.

Since there are the same number of antibody binding sites on every test tube and each test tube receives the same number of DDT-Enzyme Conjugate molecules, a sample that contains a low concentration of DDT allows the antibody to bind many DDT-Enzyme Conjugate molecules.

Therefore, a low concentration of DDT produces a dark blue solution. Conversely, a high concentration of DDT allows fewer DDT-Enzyme Conjugate molecules to be bound by the antibodies, resulting in a lighter blue solution.

NOTE: Color is inversely proportional to DDT concentration.

Darker color = Lower concentration
Lighter color = Higher concentration

Performance Characteristics

The EnviroGard DDT in Soil Test Kit will not differentiate between DDT, its metabolites, and other structurally similar compounds, but will detect their presence to differing degrees. The following table shows a number of compounds and the approximate concentration of each required to yield a positive result (Lower Limit of Detection or LLD), and the concentration required to inhibit one-half of the color developed by the Negative Control (IC50). Concentration is in parts per million (ppm) in soil.

Compound	LLD	IC50
p,p'-DDT (kit calibrator)	0.04	1.25
p,p'-DDD	0.01	0.3
p,p'-DDE	0.18	3.6
o,p'-DDT	4	93
o,p'-DDD	0.4	11
o,p'-DDE	3	93
DDA	0.002	0.04
Chloropropylate	0.007	0.08
Chlorobenzilate	0.03	0.35
Dicofol	0.14	2
Tetradifon	1.2	14
Thiobencarb	5	52
Tebuconazole	7	95
Neburon	17	284
Chloroxuron	24	216
Monolinuron	25	714
Diclofop	70	>1000

The following compounds have lower limits of detection > 100 ppm:

- 2,4-D
- Chlorbromuron
- Chlortoluron
- Diflubenzuron
- Lindane
- MCPA acid
- Mecoprop
- 4-chlorophenoxyacetic acid
- Chlordane
- Dicamba
- Diuron
- Linuron
- MCPB

ENCLOSURE

- Gilson M-25 Microman Positive Displacement Pipettor
- Eppendorf™ Repeater® Pipettor and five Combitips® (3 x 12.5 mL, 1 x 5.0 mL, and 1 x 50 mL)
- Balance capable of accurately weighing 5 grams
- Millipore Differential Photometer or Enviro-Quant Photometer
- Indelible marker for labeling test tubes
- Watch or timer
- Clean running water or a wash bottle containing tap or deionized water (500 mL)
- Calculator (optional)

Suggestions for Pipettor Use

- Practice using both pipettors (positive displacement and Repeater pipettor) with water and extra tips before you analyze your samples.
- Use a new tip each time you use the Repeater pipettor to avoid reagent cross-contamination. Label three 12.5 mL tips "Diluent", "Substrate" and "Stop," and one 5.0 mL tip "Conjugate".
- Draw the desired reagent volume into the Repeater pipettor and dispense one portion of the reagent back into the container to properly engage the ratchet mechanism. If you do not do this, the first volume delivered may be inaccurate.
- To add reagents using the Repeater pipettor, pipette down the side of the test tube just below the rim.
- To add samples and calibrators using the positive displacement pipettor, pipette down the side of the test tube just above the liquid level.
- The carryover volume of the positive displacement tips is minimal, but may affect results if you are going from a high to low DDT concentration. Use a new pipettor tip each time you pipette a new unknown.

Assay Procedure

Collect/Store the Sample

1. Collect soil in appropriately-sized and labeled containers.
2. Take care to remove excess twigs, organic matter and rocks or pebbles from the sample. For best results, wet soils should be air-dried overnight and thoroughly mixed before testing.
3. Store soil samples at 4°C (39°F).

Prepare the Sample/Extract the Soil

1. Please follow the instructions from the EnviroGard Soil Extraction Bottle Kit to prepare the soil extract before the assay.
2. **5 ml** of **Methanol** will be used to extract DDT residue from a 5 gram soil sample. As per instructions, attach a **50 mL** Combitip to the Repeater pipettor and set the dial to **5**. Deliver once to add **5 mL** of **methanol** to the extraction vial, and cap tightly.

Perform the Test

NOTE: Allow all reagents and sample extracts to reach room temperature before you begin the test. Do not analyze more than 20 test tubes at a time.

1. The choice of calibrators to use in the test will depend on the the selection of the analyst. The use of two calibrators may be appropriate if screening for a single level of DDT.

   Remove the test tubes from the plastic bag and label them as follows*:

Tube Label	Tube Contents
NC	Negative Control
C1	0.2 ppm Calibrator
C2	1.0 ppm Calibrator
C3	10.0 ppm Calibrator
S1	sample 1
S2	sample 2
etc.	

   * You are not required to perform the assay in duplicate; however, doing so will increase the precision.

   Place the test tubes in the test tube rack. Push down on each tube so that it is held firmly and does not fall out of the rack when shaken.

CAUTION: Do not "snap" the test tubes into the rack as this may result in a cracked tube.

2. Attach the **12.5 mL** Combitip labeled "Diluent" to the Repeater pipettor and adjust the dial to **2**. Add 500 microliters (µL) of Assay Diluent to each test tube.
3. Attach a clean pipette tip to the Microman pipettor and adjust the dial to "**250**". Add 25 µL of each calibrator (including Negative Control) to the corresponding test tube by placing the end

to reactivate the photometer. Record the result. Repeat this step to determine the OD for each of the remaining calibrators and for each sample.

Semi-quantitative Interpretation

Compare the OD of each sample to the OD of each calibrator:

NOTE: The word DDT in the interpretation instructions below refers to "total DDT", i.e. the sum of *p,p'*-DDT, *p,p'*-DDD, and *p,p'*-DDE.

- If a sample OD is *equal* to the OD of a calibrator, the sample contains DDT at a concentration *approximately equal* to the calibrator.
- If a sample OD is *greater* than a calibrator OD, the sample contains *less* DDT than the calibrator.
- If a sample OD is *lower* than a calibrator OD, the sample may contain *more* DDT than that calibrator.
- If an assay result indicates that a soil sample contains greater than 10 ppm total DDT, but you need more specific information, the soil extract may be diluted 1:100 in neat methanol, and assayed again. You must then multiply the results of the re-assay by 100 to determine the approximate sample concentration.

NOTE: If you know in advance that the "action level" of interest is greater than 10 ppm total DDT in soil, the assay may be modified to pinpoint that particular concentration. For example:

If you wish to categorize samples as less than or greater than 250 ppm, you should dilute all sample extracts 1:250 in neat methanol (e.g. 20 µL extract plus 4.98 mL methanol) and compare the diluted extracts to the 1 ppm DDT kit calibrator. Due to the 250-fold dilution, the 1 ppm calibrator represents 250 ppm in the assay.

NOTE: If you are interested in action levels greater than 1000 ppm, please contact Millipore Technical Services for assistance.

Example

Actual OD values will vary. This data is for demonstration purposes only.

Tube	OD	Interpretation
NC	0.90	
C1 (0.2 ppm)	0.75	
C2 (1.0 ppm)	0.49	
C3 (10.0 ppm)	0.35	
S1	0.68	>0.2 ppm < 1.0 ppm
S2	0.16	> 10.0 ppm

NOTE: The EnviroQuant Photometer is also available from Millipore. This dual wavelength instrument measures the OD at 450 nanometers (nm) minus 600 nm of all samples and calibrators, and provides a printout of results. See "Ordering Information" for the appropriate catalogue number.

Limitations of the Procedure

The EnviroGard DDT in Soil Test Kit is a qualitative/semi-quantitative screening test only. Actual quantitation of DDT by EnviroGard immunoassay is not possible due to the Test kit's cross-reactivity with DDT breakdown products and other similar compounds and to the variations in extraction efficiency inherent in the fast extraction protocol described in this product insert.

Soil sampling error may significantly affect testing reliability. The distribution of pesticides in different soils can be extremely heterogeneous. Soils should be dried and homogenized before analysis by any method. Split samples (i.e. for GC and immunoassay) should always derive from the same homogenate.

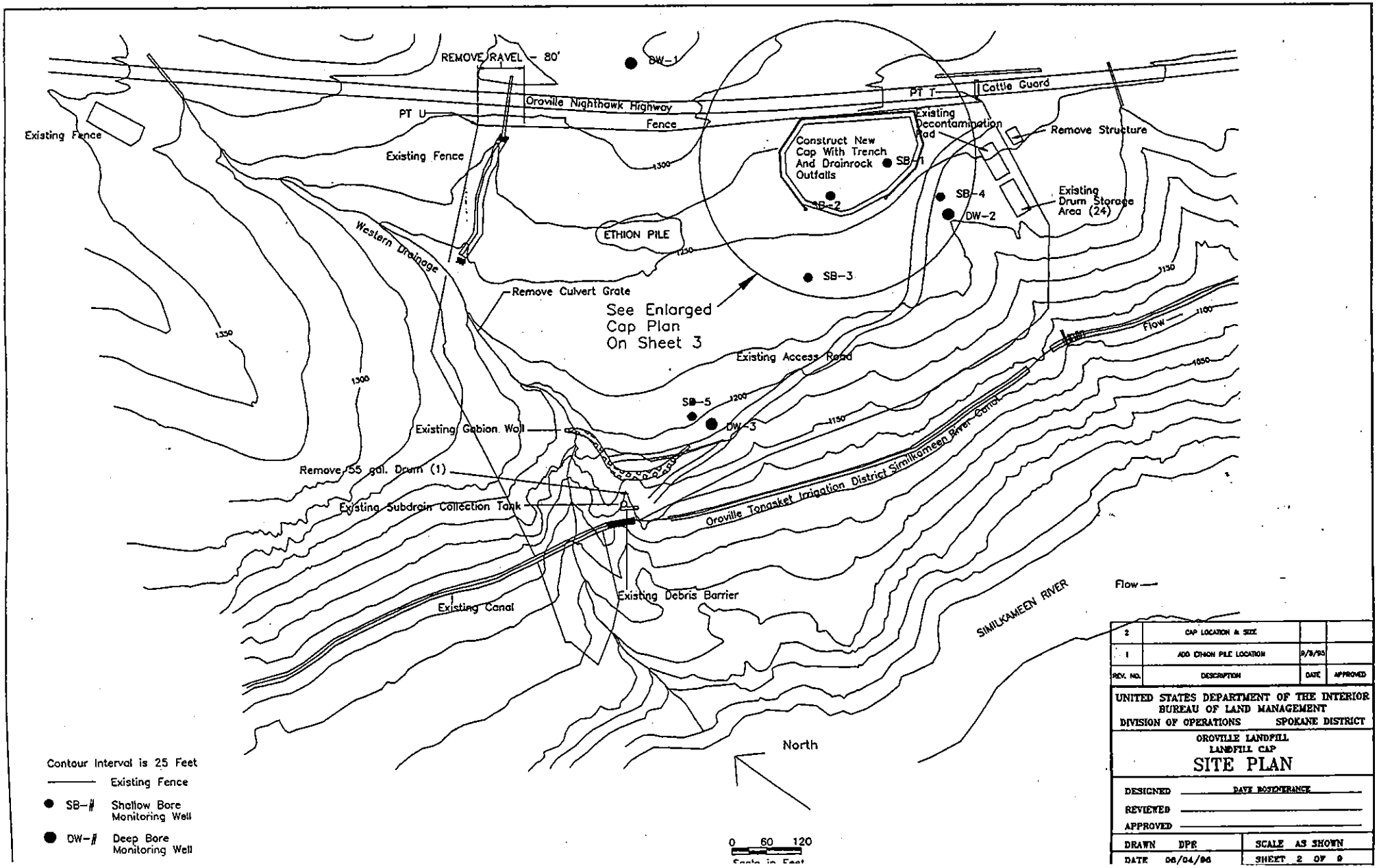
Ordering Information

The following table lists descriptions and catalogue numbers for the EnviroGard DDT in Soil Test Kit, Soil Extraction Bottle Kit and related products.

Description	Catalogue Number
EnviroGard DDT in Soil Test Kit	ENVR 000 31
EnviroGard Soil Extraction Bottle Kit	ENSP 000 30
Methanol for soil extraction, 100 mL bottle	ELCR 000 07
Millipore Differential Photometer: • 115 volt (V), or • 230 V	 ENVR 000 00 ENVR 002 30
EnviroQuant Photometer, 110V, or EnviroQuant Photometer, 220V	ENVR T11 00 ENVR T22 00
EnviroQuant Replacement Paper, 12 rolls	ENVR T11 02
Positive Displacement Precision Pipettor, Adjustable (2-250 µL) Repeater Pipettor EnviroGard Replacement Pipettor Tips (available separately): • Positive displacement pipettor tips, 1-25 µL range 200/pk (not preassembled) • Repeater pipettor tips, 5.0 mL, 100/pk • Repeater pipettor tips, 12.5 mL, 100/pk • Repeater pipettor tips, 50 mL, 10/pk	ENVR SP0 06 ENVR SP0 01 ENVR L04 09 ENVR L01 09 ENVR L02 09 ENVR L03 09
EnviroGard Soil Field Lab includes: • 1 Portable balance with 100 gram calibrator weight • 1 Eppendorf Repeater pipettor • 3 5.0 mL Pipette tips for the Repeater pipettor, for 0.1 mL through 0.5 mL dispensing volumes • 6 12.5 mL Pipette tips for the Repeater pipettor, for 0.25 mL through 1.250 mL dispensing volumes • 1 50 mL Pipette tip for the Repeater pipettor, for 1.0 mL through 5.0 mL dispensing volumes • 1 Positive displacement precision pipettor, adjustable (2-250 µL) • 1 Electronic timer • 6 Polystyrene test tubes, 12 mm X 75 mm (for blanking the spectrophotometer and sample dilutions) • 4 Test tube racks, six-position • 1 Wash bottle, 500 mL • 1 125 mL large mouth bottle • 2 Work stations • 1 Soil extraction rack Contact Millipore Technical Service for kit component replacement or reordering information. (See the "Technical Assistance" section for the number of the Millipore office nearest you.)	ENVR L00 09

APPENDIX E

CAP PLANS AND DETAILS



Contour Interval is 25 Feet

Existing Fence

SB-# Shallow Bore Monitoring Well

DW-# Deep Bore Monitoring Well

REV. NO.	DESCRIPTION	DATE	APPROVED
2	CAP LOCATION & SIZE		
1	ADD ETHION PILE LOCATION	9/8/95	

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF OPERATIONS SPOKANE DISTRICT

OROVILLE LANDFILL
LANDFILL CAP

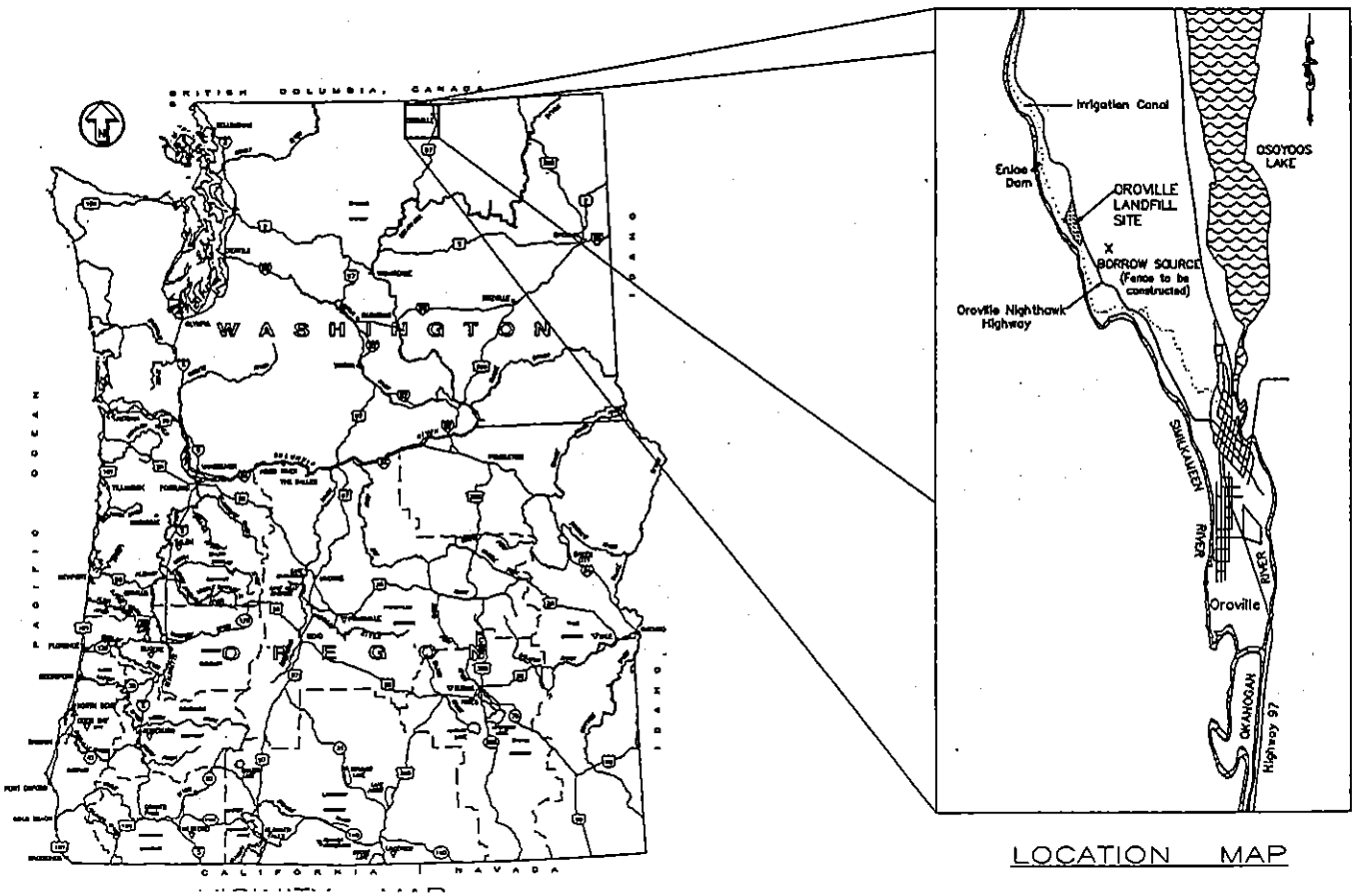
SITE PLAN

DESIGNED DAVE ROSENKRANCE
REVIEWED
APPROVED

DRAWN DPR SCALE AS SHOWN
DATE 08/04/95 SHEET 2 OF 9

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SPOKANE DISTRICT OREGON

OROVILLE LANDFILL CAP



LOCATION MAP

DRAWING INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SITE PLAN
3	DETAILS
4	BARBED WIRE FENCE (4-WIRE)
5	FIGURE FOUR AND ROCK JACK
6	WIRE GATES
7	CORNER PANELS
8	POST, POLE, AND WIRE FENCE
9	MECHANICAL GATE CLOSER

REV. NO.	DESCRIPTION	DATE	APPROVED
2	CAP CONSTRUCTION & SIZE		
1	ADD ETHION PILE	9/6/95	

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF OPERATIONS OREGON STATE OFFICE

OROVILLE LANDFILL
LANDFILL CAP

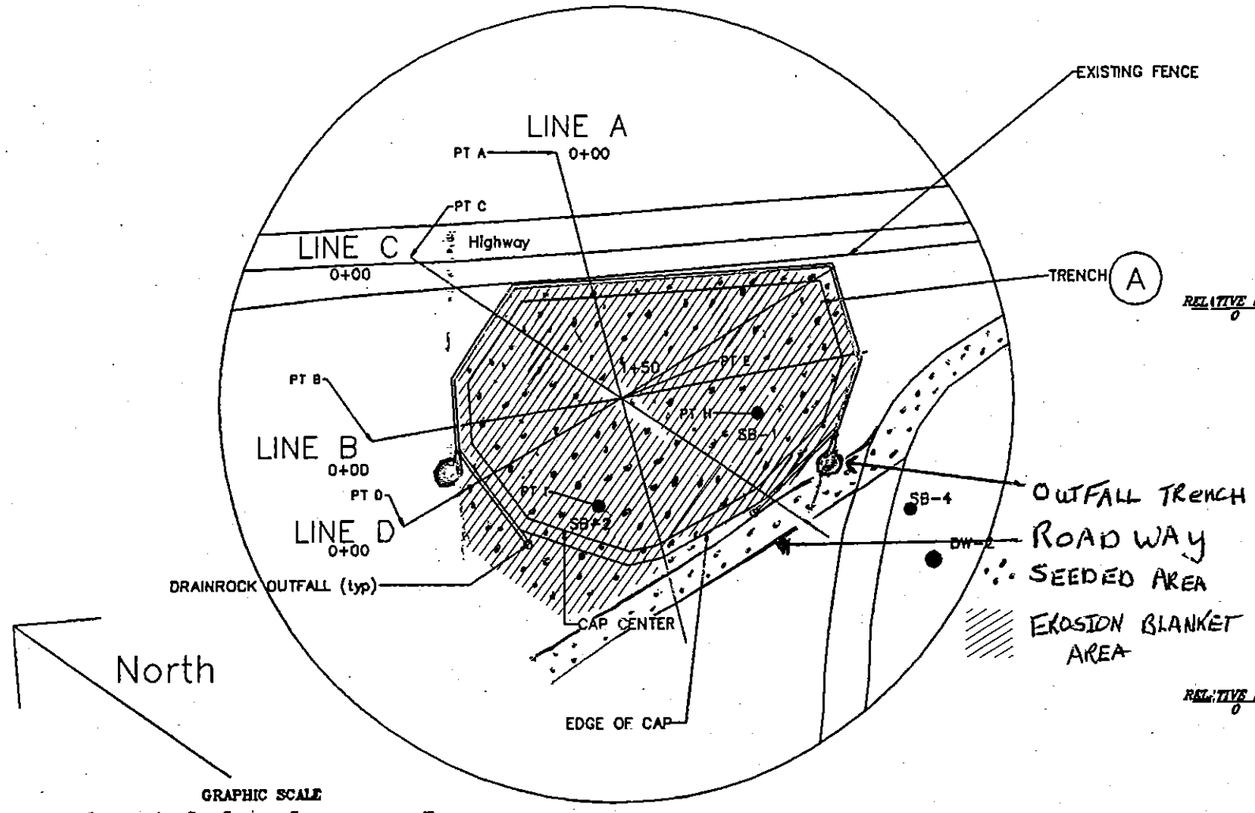
TITLE SHEET

SPOKANE DISTRICT OREGON

ENGINEERING APPROVAL _____
SUBMITTED _____
RECOMMENDED _____
APPROVED _____

DRAWN: DPR	SCALE: NONE
DATE: 5 JULY 96	SHEET 1 OF 9

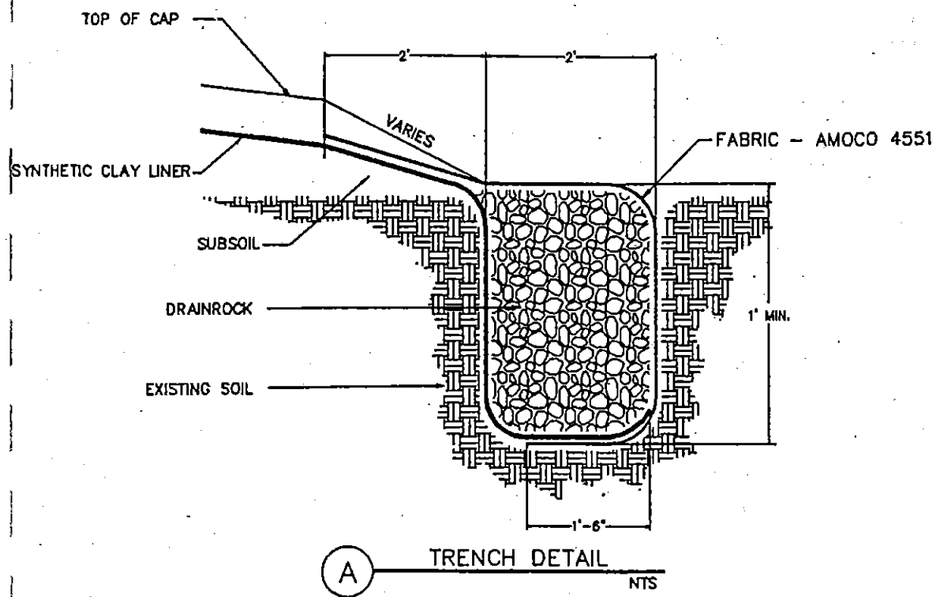
Amended by AEE March 1997



GRAPHIC SCALE

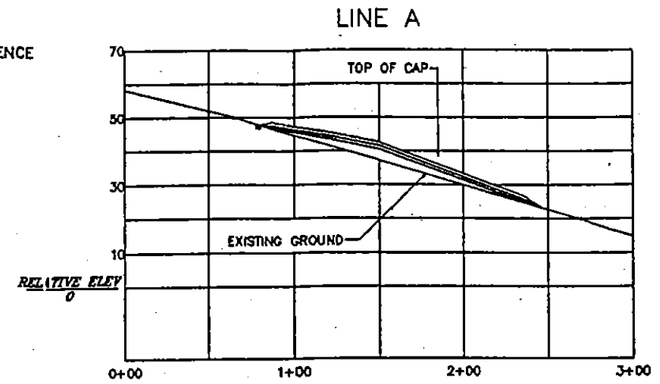
(IN FEET)

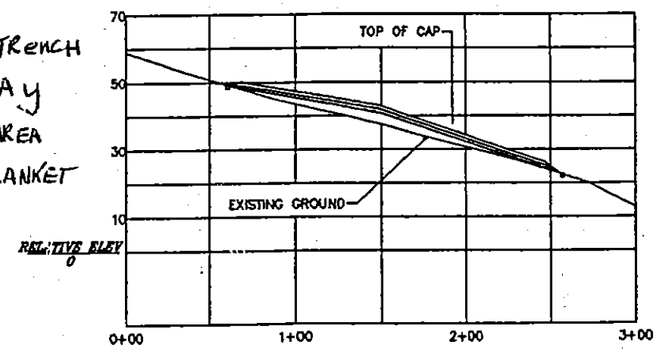
CAP PLAN

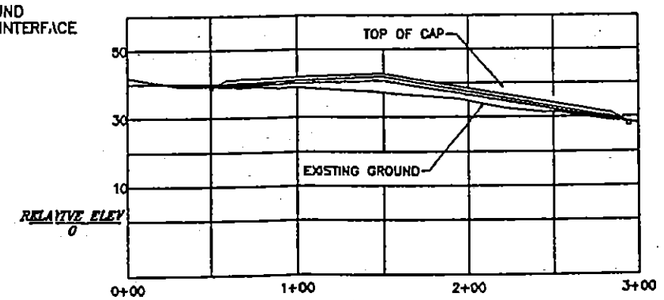


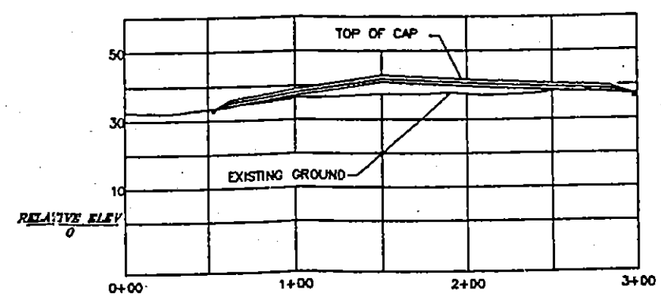
A TRENCH DETAIL

NTS









STATIONS (typ)

EXISTING GROUND
SUBSOIL/GCL INTERFACE
SUBSOIL
TOPSOIL

CAP PERIMETER IS STAKED IN THE FIELD.

CAP LAYOUT			
PT	NORTHING	EASTING	DESCRIPTION
A	2322676.12	718447.51	0+00 LINE A
B	2322567.22	718276.57	0+00 LINE B
C	2322590.00	718385.62	0+00 LINE C
D	2322585.79	718226.33	0+00 LINE D
E	2322714.94	718302.62	1+50
H	2322796.96	718293.13	SB-1
I	2322701.40	718238.64	SB-2
T	2322959.38	718395.51	FENCE CORNER
U	2322098.42	718361.42	FENCE CORNER

NOTES:

1. CAP CENTER IS THE AREA 8 FEET INSIDE THE PERIMETER OR TRENCH.
2. PLACE MISCELLANEOUS MATERIALS INTO THE CENTER OF THE CAP (See Specifications). THE CENTER OF THE CAP SHALL HAVE SUBSOIL PLACED FOR DRAINAGE, COVERED BY AN APPROVED GEOSYNTHETIC CLAY LINER (GCL), 1 FOOT OF SUBSOIL OVER THE GCL, AND 1 FOOT OF TOPSOIL OVER THE SUBSOIL.

   TOP OF CAP SHALL BE SEEDED AND COVERED WITH AN APPROVED EROSION CONTROL BLANKET.
4. SLOPE EACH LAYER OF THE CAP TO DRAIN.
5. SLOPE TRENCH TO DRAIN TOWARD DRAINROCK OUTFALLS.
6. DRAINROCK OUTFALLS SHALL BE A MINIMUM OF 5 FEET IN DIAMETER AND 1 FOOT DEEP. CENTER OF OUTFALL IS FIELD LOCATED.

REV. NO.	DESCRIPTION	DATE	APPROVED
2	CAP CONSTRUCTION & SIZE	6/4	DP

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF OPERATIONS SPOKANE DISTRICT

OROVILLE LANDFILL
LANDFILL CAP

As-Built DETAILS

DESIGNED	DAVE ROSENKRANCE
REVIEWED	Jake Jakabosky
APPROVED	Lance M Gutkam
DRAWN	DPR
SCALE	AS SHOWN
DATE	06/04/96
SHEET	3 OF 9
DRAWING NO.	OR130-02999-02

Amended by AEE March 1997

REMOVE RAVEL – 80'

DW-1

Oroville Nighthawk Highway

PT U

PT T

Cattle Guard

Fence

Existing Fence

Existing Fence

Existing Decontamination Pad

Remove Structure

Construct New Cap With Trench And Drainrock Outfalls

SB-1

SB-2

SB-4

EVAPORATION POND

Former Drum Storage Area (24)

DW-2

Former ETHION PILE

Western Drainage

SB-3

Remove Culvert Grate

See Enlarged Cap Plan On Sheet 3

Existing Access Road

Flow

SB-5

DW-3

Existing Gabion Wall

Remove 55 gal. Drum (1)

Existing Subdrain Collection Tank

Oroville Tonasket Irrigation District Similkameen River Canal

Existing Canal

Existing Debris Barrier

SIMILKAMEEN RIVER

Flow

1350 1300 1250 1200 1150 1100 1050

North

0 60 120

Scale in Feet

Contour Interval is 25 Feet

Existing Fence

SB-# Shallow Bore Monitoring Well

DW-# Deep Bore Monitoring Well

REV. NO.	DESCRIPTION	DATE	APPROVED
2	CAP LOCATION & SIZE	6/4	
1	ADD ETHION PILE LOCATION	9/8/95	

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DIVISION OF OPERATIONS SPOKANE DISTRICT

OROVILLE LANDFILL
LANDFILL CAP

As-Built SITE PLAN

DESIGNED DAVE ROSENKRANCE
REVIEWED Jake Jakabosky
APPROVED

DRAWN DPR	SCALE AS SHOWN
DATE 06/04/96	SHEET 2 OF 9
DRAWING NO. OR130-02999-01	

APPENDIX F

DAILY FIELD REPORTS

AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orville Landfill Cap	6-[redacted]914.10895	1
LOCATION	DATE	PAGE
Nighthawk Highway	9 July 1996	1 OF 4
Okanogan Co WA	ARRIVAL TIME 0500	DAY OF WEEK S S M T W T F

CLIENT OR OWNER	CLIENT OR OWNER'S REPRESENTATIVE / PHONE No.
Bureau of Land Management	Jake Jakabosky / (509) 536-1221
GENERAL CONTRACTOR: Goodfellow Bros. Inc	CONTRACTOR'S REPRESENTATIVE / PHONE No.: Kelly Ballard
SUBCONTRACTOR: —	SUBCONTRACTOR'S REPRESENTATIVE / PHONE No.: —
AGRA E&E FIELD REPRESENTATIVE: Bill Lockard	AGRA E&E PROJECT MANAGER: Curt Thompson
WEATHER: Partly Cloudy 75-80°	EQUIPMENT USED: Cat 436 B backhoe, Cat front-end loader, 3500gal water truck

COMMENTS (Describe work completed during the day; any problems and their solutions)

Arrived on site at the request of the contractor, our client, to provide construction observation services and to perform the duties of the Site Safety Officer (SSO) as defined in the project's Health and Safety Plan.

Upon our arrival we conducted a Health and Safety meeting with all of Goodfellow Bros. employees who were to be working on site. A total of 6 employees from Goodfellow will be on site. The meeting covered all of the site specific issues outlined in the Health and Safety plan including: site hazards, personal protection equipment requirements, site rules, emergency procedures, and a general outline of the scope of the project and proposed construction methodology. All in attendance were 40 hr trained and presented verification of their training. Copies of the certificates are to be provided us by Kelly Ballard.

Upon completion of the meeting the workers dressed in their PPE consisting of Tyvek or cloth overalls, chemical resistant gloves and boots [redacted] safety glasses, and hard hats. Respirators were on hand.

AGRA E&E Field Representative: Bill Lockard — AGRA E&E Project Manager: _____

Contractor's Representative: _____ Date: _____ Continued ☒

AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouille Landfill Cap	6-914-10895	1
	DATE 9 July 1996	PAGE 2 OF 4

COMMENTS (Describe work completed during the day; any problems and their solutions)

worn by workers during trench excavation or when dust was generated by equipment traveling across the exclusion zone. Today's work activities are as follows:

1) Within the cap area, which had been staked out by the BLM representatives Jake Jakabosky and Dave Rosencrans, the existing weeds were knocked down flat by back-blading with the bucket of the backhoe. The backhoe operator wore a respirator due to the dust generated.

2) Rehabilitation of the decon pad occurred, with the weeds cleared from the pad and visqueen plastic placed under the existing plastic lining on the downhill [redacted] (west) end which drained into a 55 gallon barrel. The existing barrel was 3/4 full of water and had some hose and other miscellaneous items in it. Thus the contractor elected to place this barrel within the cap for burial. The existing gravel on the pad was berned up around the edges of the pad for drainage.

3) Excavation of the drainage trench began on the south end of the proposed trench (see sketch). The trench was excavated with a backhoe to a depth of at least 12" and was 18" wide. Soils generated from excavation were placed within the cap, a minimum of 8' from the edge of the trench as specified within the amended project specifications. One laborer worked within the trench while another used a fire hose to wet down the soils being excavated. Some minor

AGRA E&E Field Rep. (Initials) BZ | AGRA E&E Project Manager (Initials) _____ | Contractor's Rep. (Initials) _____ | Continued ☒

AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouville Landfill Cap	6-914-10895	1
	DATE 9 July 1996	PAGE 3 OF 4

COMMENTS (Describe work completed during the day; any problems and their solutions)

dust was generated during excavation. All workers wore respirators with HEPA cartridges while working on the trenching activities. By the day's end approximately 3/4 of the trenching had been completed.

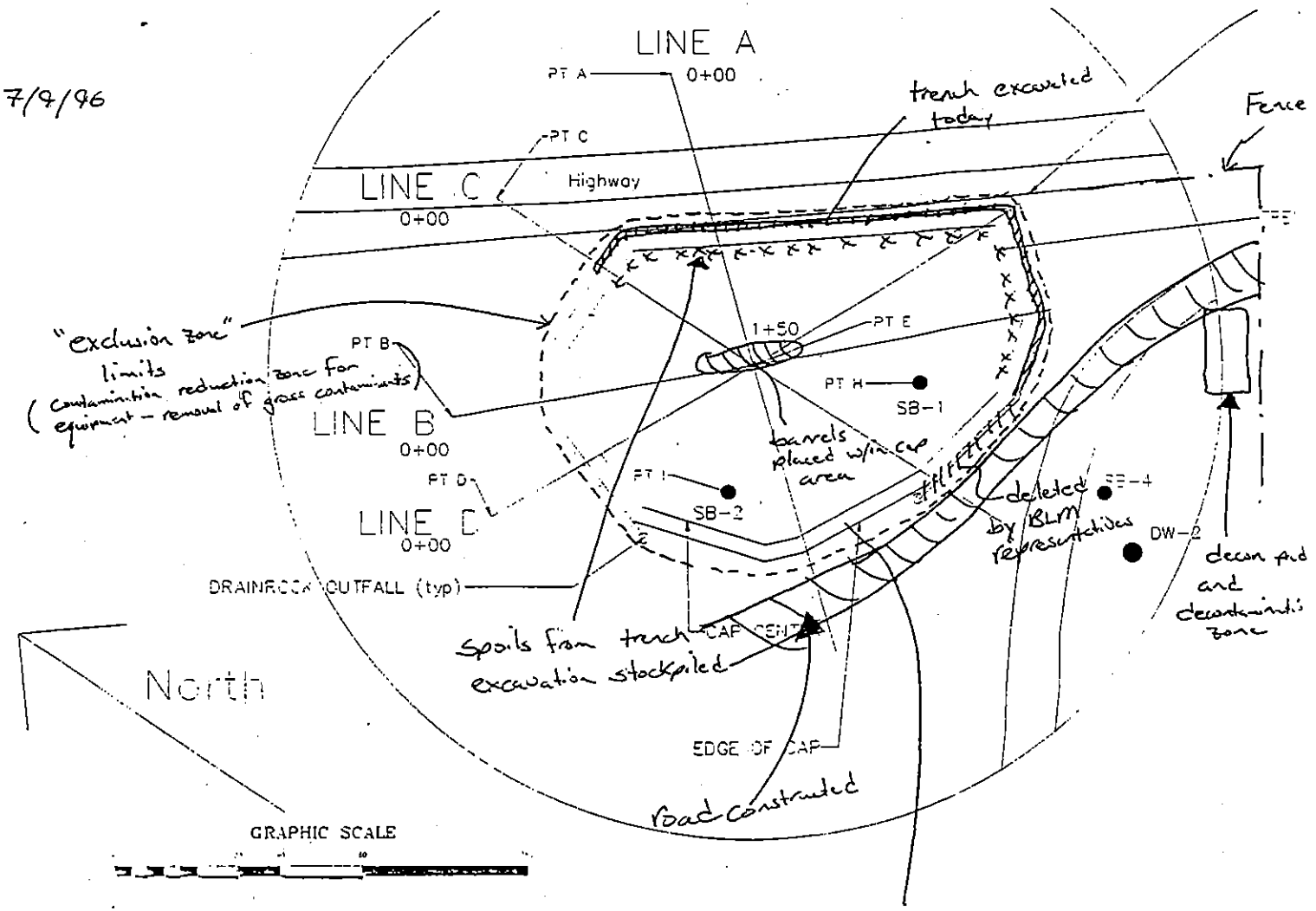
4) Several barrels were moved to the center of the cap by a rope sling strung from the front bucket of the backhoe. Approximately ½ of the barrels were removed from there location adjacent the decon pad to the cap area.

5) Prior to leaving the site, all equipment was to be decontaminated whether it entered the exclusion zone or not, according to Jake Jakabosky (w/ BLM). This recommendation was followed, with the gross particulate contamination sprayed off within the exclusion zone and the decon consisting of a final spray off on the decon pad. All workers also washed and rinsed their boots and gloves, and removed there overalls at the days end or [redacted] anytime they left the site.

BLM representative Dave Rosenkranse indicated that a permeability test was required on the subsoil to be placed under the geocomposite liner system. This test was not in our original scope and budget, we indicated to Kelly Ballard we would perform this test on a unit cost basis. A 5 gal. Sample of the subsoil was obtained from the stockpile at the borrow site, consisting of a tan SILT with trace to some gravel. The sample was shipped to our lab for testing.

AGRA E&E Field Rep. (Initials) TSZ AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued ☒

Orville Landfill Cap
6-914-10895 F.R. # 1 7/9/96
Page 4 of 4



AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME: Oroville Landfill Cap		PROJECT No.: 6-914-10895	FIELD REPORT No.: 2
LOCATION: Nighthawk Highway, Okanogan Co WA		DATE: 10 July 1996	PAGE: 1 OF 4
		ARRIVAL TIME: 0500	DAY OF WEEK: S S M T (W) T F
CLIENT OR (OWNER): Bureau of Land Management	CLIENT OR OWNER'S REPRESENTATIVE / PHONE No.: Jake Jakabosky / (509) 536-1221		
GENERAL CONTRACTOR: Goodfellow Bros. Inc	CONTRACTOR'S REPRESENTATIVE / PHONE No.: Kelly Ballard		
SUBCONTRACTOR: —	SUBCONTRACTOR'S REPRESENTATIVE / PHONE No.: —		
AGRA E&E FIELD REPRESENTATIVE: Bill Lockard	AGRA E&E PROJECT MANAGER: Curt Thompson		
WEATHER: Sunny upper 80°s	EQUIPMENT USED: no change		

COMMENTS (Describe work completed during the day; any problems and their solutions)

Arrived on site at the client's request, to perform health and safety monitoring at the above referenced site, as detailed within the Health and Safety plan dated June 1996.

Jake Jakabosky with the BLM indicated that the draft Health and Safety Plan dated June 1996 was generally acceptable with some minor modifications which he indicated to us. These modifications were in turn passed on to Tom Flynn (w/ AGRA) who incorporated them into the final version of the Health and Safety plans to be provided at a later date.

As with yesterday, all workers within the exclusion zone wore the proper PPE as specified within the Health and Safety plan. Respirators were worn during trenching activities and while working around the ethion pile or in other potential dust generating activities.

Today's work activities are summarized subsequently:

1) The 55 gal barrel located within the ravine adjacent to the existing leachate collection system was retrieved and subsequently

AGRA E&E Field Representative: Bill Lockard AGRA E&E Project Manager: _____

Contractor's Representative: _____ Date: _____ Continued ☐

AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Oroville Landfill Cap	6-914-10895	2
	DATE: 10 July 1996	PAGE: 2 OF 4

COMMENTS (Describe work completed during the day; any problems and their solutions)

placed within an overpack drum before it was hauled to the cap area. The existing barrel had a hole rusted in one side of it and contained discarded PPE and water with some sludge at the bottom.

2) The remaining barrels from the decon area were placed within the cap area. One additional drum, previously assumed as empty was found to contain PPE debris, and thus was placed within the cap. A total of 28 barrels was placed within the cap. Although 1 barrel was placed by the contractor which was not required (the original decon barrel).

3) The remainder of the drainage trench was excavated today in the same manner as previously described. Dave Rosenkranse viewed the completed trench and indicated it was acceptable. The outfalls were dug such that there was a 5' radius around the staked location of the outfall that was 1' deep.

4) The front-end loader and backhoe were used to remove the ethion pile to the cap area. The water truck was used to hand spray the pile during loading to minimize dust generated. Nearly all dust was contained during the moving of the pile. A total of approximately 15-20 yds were moved to within the center of the cap. All workers during this phase of work were respirators as a precaution.

5) Several of the piles of soil generated by trenching activities were backbladed flat, however unacceptable

AGRA E&E Field Rep. (Initials) BZ | AGRA E&E Project Manager (Initials) _____ | Contractor's Rep. (Initials) _____ | Continued ☒

AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Oroville Landfill Cap	6-914-1895	2
	DATE 10 July 1996	PAGE 3 OF 4

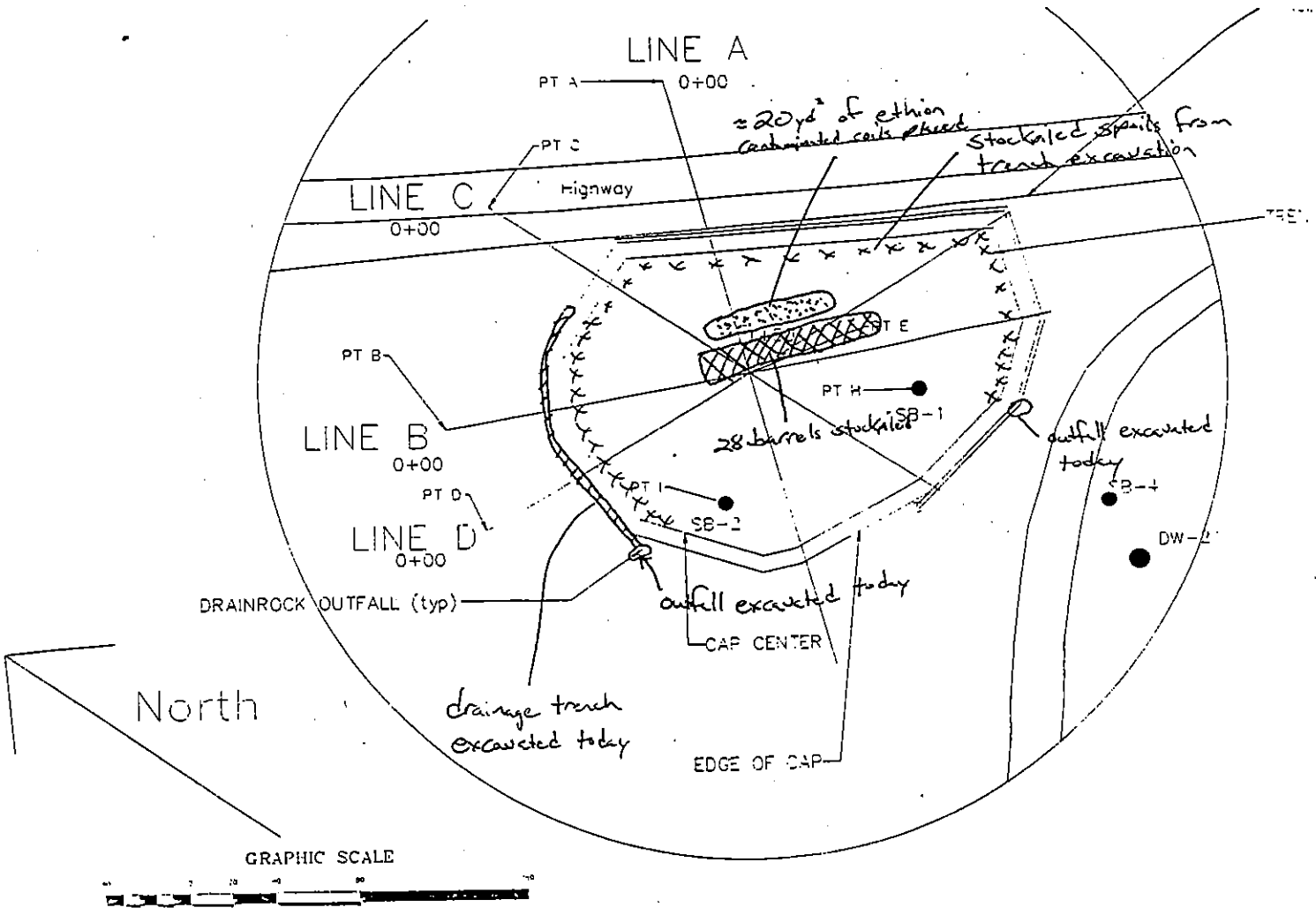
COMMENTS (Describe work completed during the day; any problems and their solutions)

amounts of dust were noted thus work was halted until the areas could be wetted. However, no further work occurred since the water truck had to be filled which took until the day's end.

6) Before equipment or personnel left the site, decon procedures were performed which consisted of pressure washing the equipment and scrub brush cleaning the workers boots and gloves then rinsing.

AGRA E&E Field Rep. (Initials) BR AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued ☒

Oroville Landfill Cap
6-914-10895 F.R. #2
7/10/96 page 4 of 4



AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME: Orouille Landfill Cap		PROJECT No.: 6-914-10895	FIELD REPORT No.: 3
LOCATION: Nighthawk Highway Okanogan Co WA		DATE: 11 July 1996	PAGE: 1 OF 4
		ARRIVAL TIME: 0500	DAY OF WEEK: S S M T W T F
CLIENT OR OWNER: Bureau of Land Management	CLIENT OR OWNER'S REPRESENTATIVE / PHONE No.: Jake Jakabosky / (509) 536-1221		
GENERAL CONTRACTOR: Goodfellow Bros. Inc.	CONTRACTOR'S REPRESENTATIVE / PHONE No.: Kelly Ballard		
SUBCONTRACTOR: —	SUBCONTRACTOR'S REPRESENTATIVE / PHONE No.: —		
AGRA E&E FIELD REPRESENTATIVE: Bill Lockard	AGRA E&E PROJECT MANAGER: Curt Thompson		
WEATHER: Sunny 90°	EQUIPMENT USED: Cat D5 dozer add: 1 smooth drum roller 4 x 10yd solo truck		

COMMENTS (Describe work completed during the day; any problems and their solutions)

Arrived on site on the contractor's behalf, to perform Health and Safety monitoring services at the above referenced site. Work performed today included the use of 4 solo dump trucks. Each driver was informed of the site contamination and was instructed to not exit their truck nor could the trucks travel off of the subsoil being imported on to the site without requiring decontamination. None of the truck drivers were 40 hr trained.

All workers entering into the exclusion zone were wearing the proper PPE as outlined in the site Health and Safety plan.

Today's activities are summarized below:

1) The exclusion zone and the stockpiled soils within the cap area were wetted down for dust control by the water truck. The stockpiles were then backbladed smooth. During operation of the backhoe the operator wore a ~~respirator~~ respirator, as did the laborer within the exclusion zone.

AGRA E&E Field Representative Bill Lockard AGRA E&E Project Manager _____

Contractor's Representative _____ Date _____ Continued X

AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Oroville Landfill Cap	6-914-10895	3
	DATE 11 July 1996	PAGE 2 OF 4

COMMENTS (Describe work completed during the day; any problems and their solutions).

2) Once the stockpiled soils had been backbladed and wetted down, the smooth drum vibratory roller compacted the subgrade soils to a relatively firm and unyielding state, as determined by observation of construction traffic across the rolled areas. The operator wore a respirator during rolling. Minor amounts of dust was noted.

3) The 28 barrels within the cap were crushed using the blade and tracks of the D5 dozer. The barrels were crushed to a thickness averaging 4 to 8 inches. Additional passes by the dozer and smooth drum roller were made to flatten the barrels to the specified 4 inches, with minimal effect. Operators and workers within this area wore respirators. A slight to moderate "pesticide" odor was noted to emanate from the crushed barrels and ethion pile.

4) Solo dump trucks began hauling subsoil on to the project site. The initial loads were utilized for "capping" the existing road with a layer of "clean" soils thus making it unnecessary to decon each truck, provided it stayed on the imported subsoils. By approximately 0930 the haul road had been "capped" and subsoil was being placed within the exclusion zone. The subsoils were end-dumped and then bladed into place by the dozer. The operator of the dozer took care to not travel off of the subsoil. A 6-10" loose lift of subsoil was bladed into place by the dozer within the approximate area indicated on the attached sketch

AGRA E&E Field Rep. (Initials) JS2 AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued X

AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouille Landfill Cap	6-914-10895	3
	DATE: 11 July 1996	PAGE: 5 OF 4

COMMENTS (Describe work completed during the day; any problems and their solutions)

By the day's end the crushed barrels and the ethion piles had been covered by approximately 6" of subsoil.

All decon and PPE issues were adhered to during the course of the day. We indicated to Kelly Ballard that once the subsoil had been placed within the cap area covering the existing soils, the level of PPE could be modified accordingly.

No work was to occur on site until Monday morning.

Note: Subsoils being delivered to the site consisted chiefly of a tan to brown SILT with varying amounts of gray clay. Several loads were noted to be above optimum moisture content. We also noted occasional loads which contained cobbles and small boulders, the small boulders were segregated out by the dozer.

AGRA E&E Field Rep. (Initials) JB2 AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued X

Oroville Landfill Cap
6-914-10895 F.R. #3
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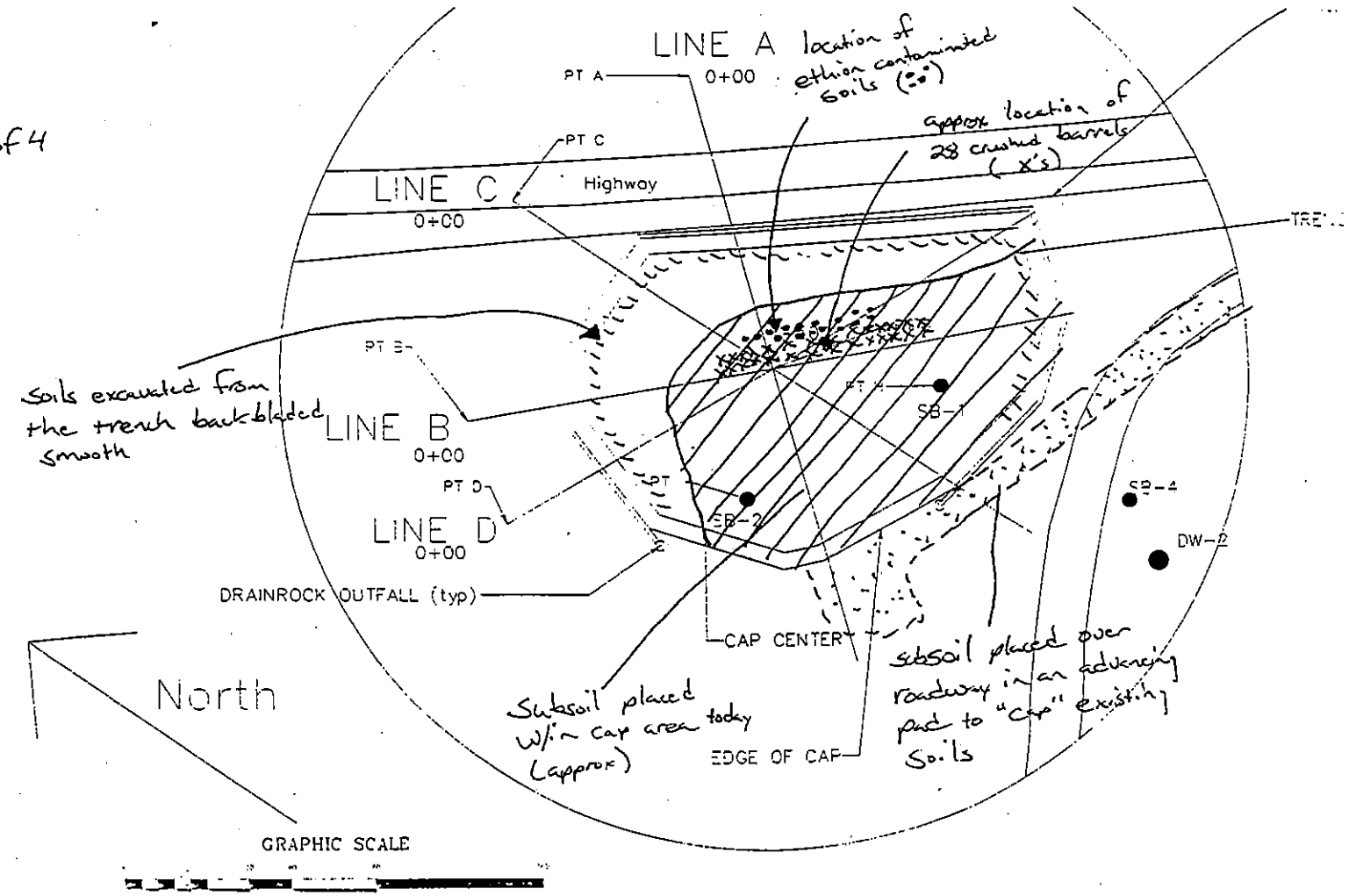

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DAILY FIELD REPORT

PROJECT NAME: Orouille Landfill Cap		PROJECT No.: 6-914-10895	FIELD REPORT No.: 41
LOCATION: Nighthawk Highway, Okanogan Co WA		DATE: 15 July 1996	PAGE: 1 OF 6
		ARRIVAL TIME: 0500	DAY OF WEEK: S S (M) T W T F
CLIENT OR (OWNER): Bureau of Land Management	CLIENT OR OWNER'S REPRESENTATIVE / PHONE No.: Jake Jakabosky / 509-536-1221		
GENERAL CONTRACTOR: Goodfellow Bros. Inc	CONTRACTOR'S REPRESENTATIVE / PHONE No.: Kelly Ballard / mobile 509-670-1338		
SUBCONTRACTOR: —	SUBCONTRACTOR'S REPRESENTATIVE / PHONE No.: —		
AGRA E&E FIELD REPRESENTATIVE: Bill Lockard	AGRA E&E PROJECT MANAGER: Curt Thompson		
WEATHER: Sunny, very hot ≈ 100°	EQUIPMENT USED: no change		

COMMENTS (Describe work completed during the day; any problems and their solutions)

Arrived on site at the contractor's request to provide observation as part of the Health and Safety plan requirements and to provide construction observation and testing services. Todays activities are summarized below:

1) Placement and compaction of the subsoil within the landfill cap occurred today. area. Subsoil was end dumped by the side dump trucks and the bladed into place by the dozer in approximately 4 to 6" loose lifts. The initial lift was approximately 8" to provide adequate coverage over the existing soils to prevent equipment from "punching through" the imported subsoils into the underlying site soils. Initially subsoils were placed on the existing haul road to "cap" the existing soils thus allowing the dump trucks to stay on "clean" import soils at all times so that decontaminating each truck would not be necessary. As with activities on Thursday all equipment stayed on the import soils thus minimizing mixing of the site soils with the imported subsoil.

AGRA E&E Field Representative _____ AGRA E&E Project Manager _____

Contractor's Representative _____ Date _____ Continued ☒

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DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Oroville Landfill Cap	6-914-10895	4
	DATE: 15 July 1996	PAGE: 2 OF 6

COMMENTS (Describe work completed during the day; any problems and their solutions)

The remaining areas to be covered around the perimeter of the cap area were covered with imported subsoil. At the day's end the cap area had approximately 6-8" of subsoil around the perimeter (adjacent the trench) mantling the native site soils, thickening towards the center of the cap where approximately 2-2½' of imported subsoil mantled the crushed drums. (see sketch).

2) Density testing was performed upon the compacted subsoils using a CPN (MC1 model), nuclear densometer in general accordance with ASTM D2922 standards. The density tests were performed at random locations across the cap area. Test results indicated that the subsoils placed had generally been compacted to meet or exceed the required 95% compaction (by ASTM D698, Standard proctor procedures). Test results are attached with test locations shown on the site sketch. Moisture conditioning of the subsoil was recommended and subsequently performed by the contractor due to some of the imported subsoil being too dry. Isolated pockets of wet clayey soils were also noted. Some minor "pumping" was observed under construction traffic, in these areas where wet clayey soils existed.

3) As requested by Dave Rosakrance we provided continuous air monitoring of the well casings ~~due~~ before and during welding operations on the casings which were raised by 2-3' to accomodate the fill being placed within the landfill cap

AGRA E&E Field Rep. (Initials) BL — AGRA E&E Project Manager (Initials) _____ — Contractor's Rep. (Initials) _____ — Continued X

AGRA Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouille Landfill Cap	6-914-0895	4
	DATE: 15 July 1996	PAGE: 3 OF 6

COMMENTS (Describe work completed during the day; any problems and their solutions)

area. A portable, PhD Ultra, multi gas detector was utilized to monitor for [redacted] oxygen levels, carbon monoxide and combustible gas (LEL). Readings within the casings and within the 2" ø wells were non-detectable for CO, and LEL and normal for O_2 levels (20.9-21.2%) within both wells and casings. Once these levels were determined, the welder was allowed to weld.

4) The geocomposite liner (GCL) was delivered in the afternoon. The load was covered by a tarp with each roll also individually wrapped in plastic. The rolls were off-loaded by means of the front-end loader using a long iron pipe pushed through the center tube of each roll. Each roll was carefully unloaded and then stacked outside of the fenced landfill area.

5) Final smooth drum rolling and fine grading was completed on the landfill cap subsoils. The cap was graded such that no significant depressions existed and that positive drainage was maintained across the entire cap area. The majority of the large rocks and gravel was also removed from the surface of the subsoils, in preparation for placement of the GCL.

6) During final rolling along the northwest edge of the cap subsoils, the vibratory drum roller overturned onto its side. The operator was not injured. No fuel or oil leakage occurred. An accident report will be provided by Goodfellow Br

AGRA E&E Field Rep. (Initials) TBZ | AGRA E&E Project Manager (Initials) _____ | Contractor's Rep. (Initials) _____ | Continued ☒

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DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Oroville Landfill Cap	6-914-10895	
	DATE: 15 July 1996	PAGE: 4 OF 6

COMMENTS (Describe work completed during the day; any problems and their solutions)

7) Due to the existing soils being covered ~~within the~~ by 6" to 2½' of subsoil within the cap area (exclusion zone) We reduced the required PPE levels to normal construct. Safety equipment. However, any worker coming close or entering into the exposed drainage trench surrounding the cap area will still be required to wear level C PPE.

AGRA E&E Field Rep. (Initials) TBZ AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued

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DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orrville Landfill Cap	6-914-10895	4
	DATE: 15 July 1996	PAGE: 5 OF 6

SUMMARY OF FIELD COMPACTION TEST RESULTS

TEST No.	TEST METHOD	LOCATION	ELEV. (FEET)	DISTANCE BELOW GRADE	MAT'L TYPE	FIELD DRY DENSITY (PCF)	FIELD MOIST. (%)	FIELD COMP. (%)	VARIATION FROM OPTIMUM MOIST. (%)	PASS OR FAIL
DT-1	N	see sketch			S-1	98^{6}	23^{0}	94		P
2	↓	↓			↓	108^{5}	16^{7}	100		P
3						94^{4}	23^{8}	95		P *
4						99^{4}	21^{2}	100		P
5						96^{9}	21^{3}	98		P
6						103^{2}	10^{2}	100		P
7	↓	↓			↓	110^{3}	13^{3}	100		P

* pumping slightly

PERCENT COMPACTION BASED ON:

- [X] STANDARD PROCTOR ASTM D 698
- [ ] MODIFIED PROCTOR ASTM D 1557
- [ ] OTHER _____

SPECIFICATION:

- [ ] 90% D 698
- [X] 95% D 698
- [ ] 90% D 1557
- [ ] 90% D 1557
- [ ] OTHER _____

TEST NUMBER

DT = DENSITY TEST
RT = RETEST

TEST METHOD

N = NUCLEAR (ASTM D 2922)
SC = SAND CONE (ASTM D 1556)
DC = DRIVE CYLINDER (ASTM D 2937)

MATERIAL TYPE	REFERENCE SAMPLE No.	MATERIAL DESCRIPTION	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOIST. (%)
	S-1	tan-brown SILT with trace some clay	83	31
		rock correction → for gravel content in field	99	

AGRA E&E Field Rep. (Initials) _____ AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued

Oroville Landfill Cap
6-914-10895 F.R.# 4
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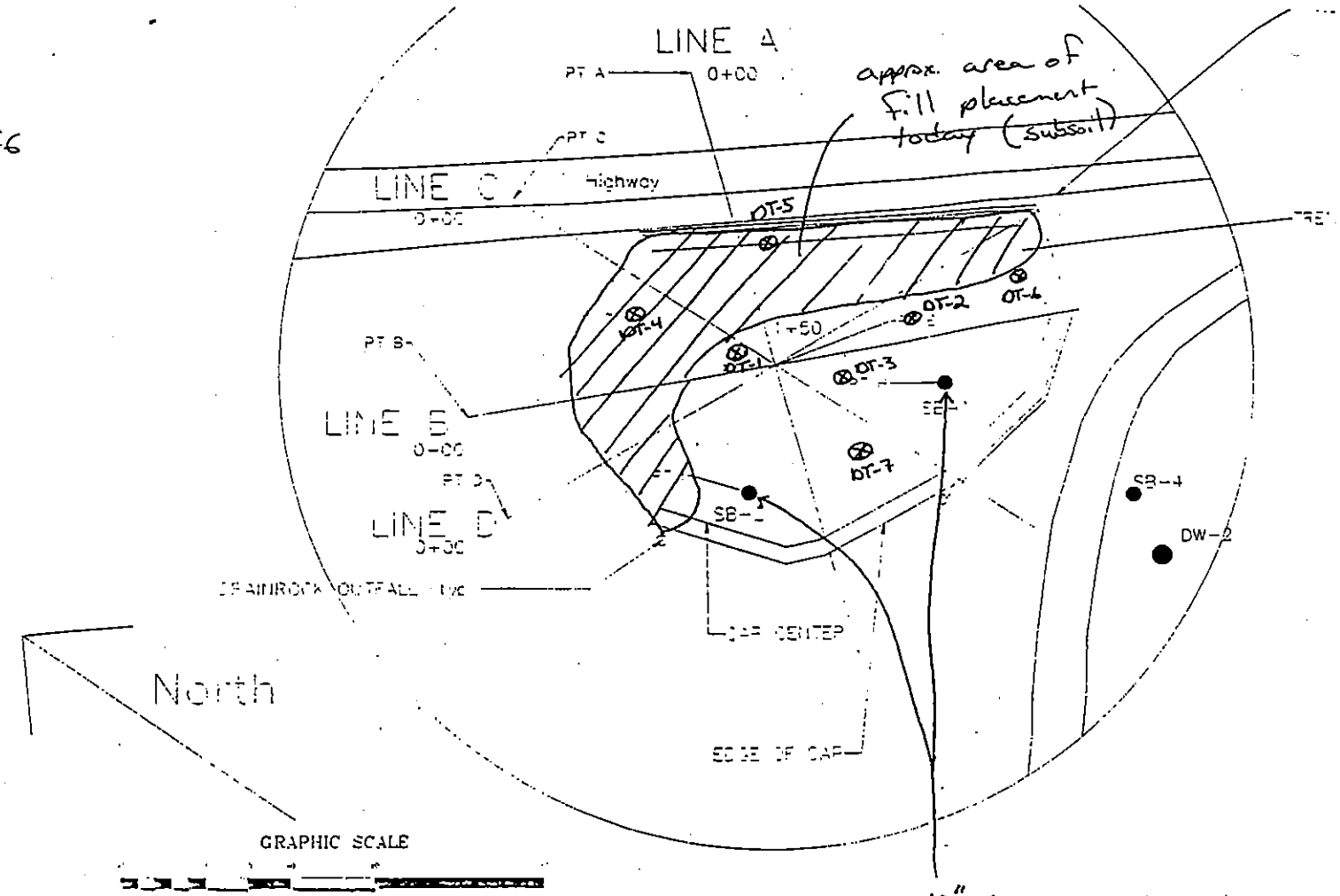

10" ø, steel well casings raised 2'-3' by welding on additional casing

DT-7 ⊗ — density test # and location

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DAILY FIELD REPORT

PROJECT NAME: Orouille Landfill Cap		PROJECT No.: 6-914-10595	FIELD REPORT No.: 5
LOCATION: Nighthawk Highway, Okanogan Co WA		DATE: 16 July 1996	PAGE: 1 OF 3
		ARRIVAL TIME: 0500	DAY OF WEEK: S S M (T) W T F
CLIENT OR (OWNER): Bureau of Land Management	CLIENT OR OWNER'S REPRESENTATIVE / PHONE No.: Jake Jakabosky / 509-536-1221		
GENERAL CONTRACTOR: Goodfellow Bros. Inc	CONTRACTOR'S REPRESENTATIVE / PHONE No.: Kelly Ballard / 509-670-1338 (mobile		
SUBCONTRACTOR: Layfield Plastics	SUBCONTRACTOR'S REPRESENTATIVE / PHONE No.: Victor Barney		
AGRA E&E FIELD REPRESENTATIVE: Bill Lockard	AGRA E&E PROJECT MANAGER: Curt Thompson		
WEATHER: Sunny to partly cloudy 85-90°	EQUIPMENT USED: no change		

COMMENTS (Describe work completed during the day; any problems and their solutions)

Arrived on site at the contractor's request to provide Health and Safety monitoring and construction observation ~~Services~~ and testing services. Upon arrival we met with the 3 employees of Layfield Plastics who were on site to assist Goodfellow Bros on placement of the GCL liner. We conducted a health and safety briefing informing the Layfield employees of the site hazards and the required PPE. Each indicated that they had completed 40 hr hazardous materials training although only one employee could provide verification. Victor Barney indicated that ~~the~~ copies of the other two certificates ~~can~~ would be provided by his office.

Today's activities are summarized below:

1) Installation of the Bentomat GCL began, using the front-end loader equipped with a spreader bar, a support bar and slings to transport the rolls to the upslope side of the cap area. The rolls were 15' x 125' each individually numbered. The end of the rolls was placed in the bottom of the

AGRA E&E Field Representative _____ AGRA E&E Project Manager _____

Contractor's Representative _____ Date _____ Continued ☒

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DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouville Landfill Cap	6-914-10895	5
	DATE 16 July 1996	PAGE 2 OF 3

COMMENTS (Describe work completed during the day; any problems and their solutions)

drainage trench and then unrolled downslope. Each panel was overlapped by 9" such that they were "shingled" to allow for proper drainage. During placement rutting was observed in several areas which was subsequently rolled out by the smooth drum roller before the GCL was placed over the area.

2) Defects noted within the GCL were marked with paint for patching upon completion of the installation.

3) As placement continued, working from South to north, rutting severity increased due to wet clayey soils present within the areas. We also noted some isolated [redacted] (< 5 ft² area spots which pumped under foot traffic. Due to the isolated nature of these areas, [redacted] they should not adversely effect the performance of the cover system, in our opinion. Because of the soft areas, several panels were installed by hand to minimize disturbance to the subgrade soils.

4) Workers who entered into the trenches were required to wear level C protection due to the dust being generated during installation within the trenches.

5) Due to the possibility of overnight rain, work was halted on GCL installation to begin covering the installed GCL with plastic sheeting. By the days end all installed liner had been covered with plastic. Approximately 3/4 of the cap area has been covered by the ~~GC~~ GCL.

AGRA E&E Field Rep. (Initials) JB2 AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued ☒

Orouville Landfill Cap
6-914-10895
7/16/96
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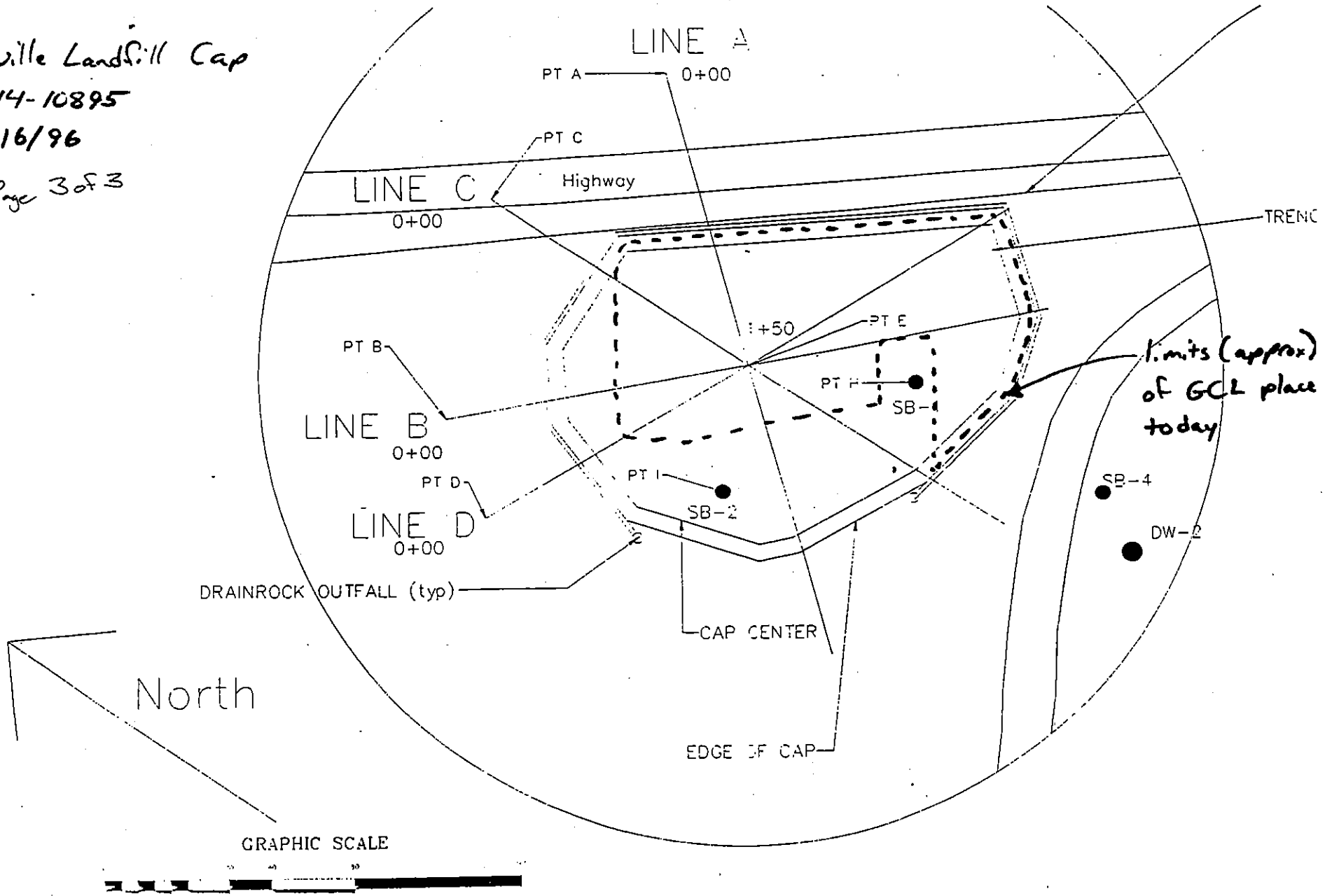

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DAILY FIELD REPORT

PROJECT NAME: Orouille Landfill Cap		PROJECT No.: 6-914-1085	FIELD REPORT No.: 6
LOCATION: Nighthawk Highway, Okanogan Co WA		DATE: 17 July 1996	PAGE: 1 OF 3
		ARRIVAL TIME: 0500	DAY OF WEEK: S S M T (W) T F
CLIENT OR OWNER: Bureau of Land Management	CLIENT OR OWNER'S REPRESENTATIVE / PHONE No.: Jake Jakabosky / (509) 536-1221		
GENERAL CONTRACTOR: Goodfellow Bros. Inc.	CONTRACTOR'S REPRESENTATIVE / PHONE No.: Kelly Ballard / (509) 670-1338 (mobile *		
SUBCONTRACTOR: Layfield Plastics	SUBCONTRACTOR'S REPRESENTATIVE / PHONE No.: Victor Barney		
AGRA E&E FIELD REPRESENTATIVE: Bill Lockard	AGRA E&E PROJECT MANAGER: Curt Thompson		
WEATHER: Afternoon showers turning to rain 60's - 70's	EQUIPMENT USED: no change		

COMMENTS (Describe work completed during the day; any problems and their solutions)

Arrived on site on the client's behalf to provide health and safety duties as described in the Health and Safety Plan (dated June 1996) and construction observation services.

Today's activities are summarized below:

1) The visqueen placed yesterday over the GCL was removed and the remaining areas to be covered with the GCL was covered, as described in yesterday's field report.

2) "Patching" of the defective areas of the liner occurred. The patches consisted of a cut piece of the GCL placed over the defective area such that at least 9" of overlap around the defect was covered by the patch.

3) Granular bentonite was hand applied along all seams and around all patches. The bentonite was spread by pouring from a plastic container, thus leaving a ≈2" wide bead of bentonite. Approximately 1/4 lb of bentonite was placed per lineal foot of seam, as per the mfg specs.

AGRA E&E Field Representative: Bill Lockard AGRA E&E Project Manager: _____

Contractor's Representative: _____ Date: _____ Continued ☒

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DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Oroville Landfill Cap	6-914-1089.5	6
	DATE: 17 July 1996	PAGE: 2 OF 3

COMMENTS (Describe work completed during the day; any problems and their solutions)

4) By 1100 the majority of "sealing" of the seams had been completed. Trucks began hauling subsoil to be placed over the GCL liner. The subsoil was bladed over the GCL in a minimum of 12" lifts in front of the advancing dozer. Care was taken to not turn on the covered GCL with the dozer to prevent shearing of the material, thus only straight line paths were [redacted] taken by the dozer. We did not observe any wrinkling of the GCL during subsoil placement.

5) By 1430 approximately 1/3 of the [redacted] cap area had been covered by at least 12" of subsoil. At this time it began sprinkling, turning to a moderate to heavy rain by 1530. At the onset of rain, the visqueen was placed over the GCL to protect it from the wet weather. Prior to our departure, all of the GCL had been covered as best possible, with visqueen.

6) 3 workers entered into the uncovered trenches throughout the day. All were in [redacted] level C protective gear. At the day's end all three workers decontaminated their boots and gloves and removed their coveralls or tyvek before leaving the site.

7) Prior to placement of subsoil, all defective areas noted during installation were patched as per the mfg. recommend.

AGRA E&E Field Rep. (Initials) JSZ AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued ☒

Oroville Landfill Cap
6-914-10895 F.R. #6
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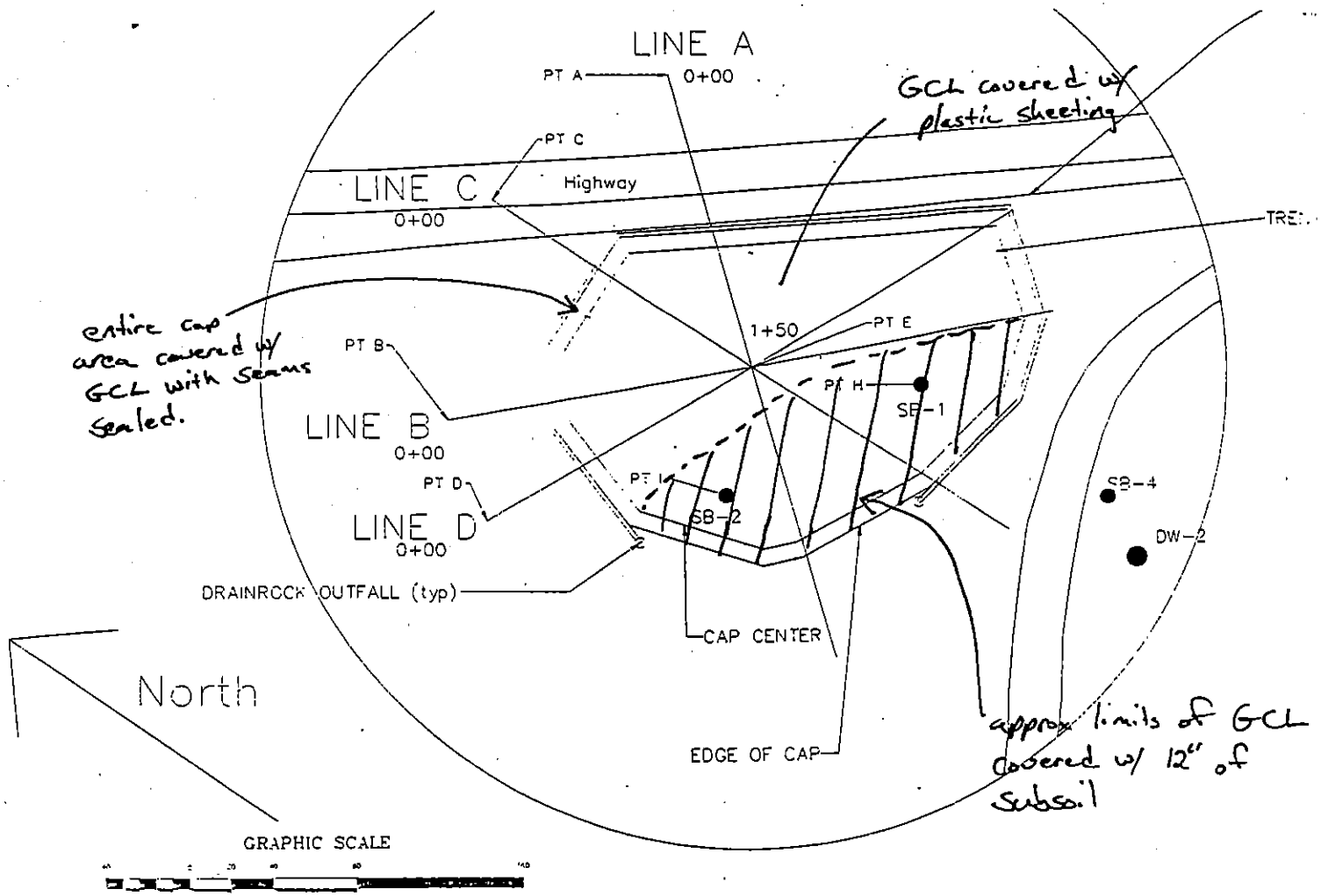

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DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouville Landfill Cap	6-914-10895	7
LOCATION	DATE	PAGE
? Nighthawk Highway	18 July 1996	1 OF
OKanogan Co WA	ARRIVAL TIME 0500	DAY OF WEEK S S M T W (T) F

CLIENT OR (OWNER)	CLIENT OR OWNER'S REPRESENTATIVE / PHONE No.
Bureau of Land Management	Jake Jakabosky / (509) 536-1221
GENERAL CONTRACTOR	CONTRACTOR'S REPRESENTATIVE / PHONE No.
Goodfellow Bros. Inc	Kelly Ballard / (509) 670-1338 (mobile)
SUBCONTRACTOR	SUBCONTRACTOR'S REPRESENTATIVE / PHONE No.
—	—
AGRA E&E FIELD REPRESENTATIVE	AGRA E&E PROJECT MANAGER
Bill Lockard	Curt Thompson
WEATHER	EQUIPMENT USED
Mostly cloudy, morning showers, 60-70°	no change

COMMENTS (Describe work completed during the day; any problems and their solutions)

Arrived on site at the client's request to ~~perform~~ provide health and safety duties as the SSO and to provide construction observation and testing. Overnight heavy rains had occurred leaving the surface of the subsoil placed yesterday saturated. The saturated soils were bladed off to the side of the cap area to allow them to dry. The covered GCL was uncovered, exposing the GCL as work progressed. Visual inspection of the GCL disclosed several areas which were wet or saturated from leaks ~~with~~ in the plastic sheeting. The wet GCL was identified by its dark discoloration. Any wet GCL was considered unsuitable since its permeability is increased if it becomes wet before covering, as indicated in the product data sheets.

The GCL was uncovered and subsoil was subsequently placed over in a 12" lift as described previously. Where leaks had occurred, the GCL was repaired by cutting a new ~~piece~~ piece of GCL and placing it over the wet

AGRA E&E Field Representative Bill Lockard AGRA E&E Project Manager _____

Contractor's Representative _____ Date _____ Continued X

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DAILY FIELD REPORT

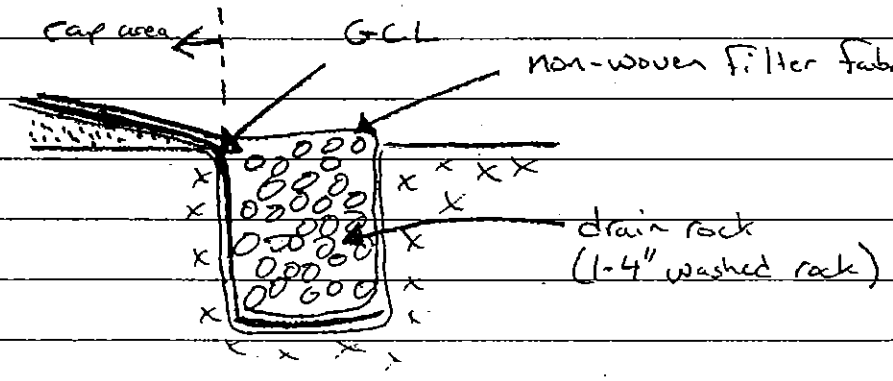
PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouille Landfill Cap	6-914-10895	7
	DATE: 18 July 1996	PAGE: 2 OF 3

COMMENTS (Describe work completed during the day; any problems and their solutions)

GCL such that it overlapped the area by at least 6". A "bead" of bentonite (granular) was then hand applied around the edges of the patch to "seal" the seam between the patch and the underlying GCL.

Placement of subsoil over the GCL occurred throughout the day. By day's end the majority of the liner area and GCL had been covered by at least 12" of subsoil. However along the northern edge of the cap, adjacent the trench, the area was left uncovered with subsoil, pending completion of the trench.

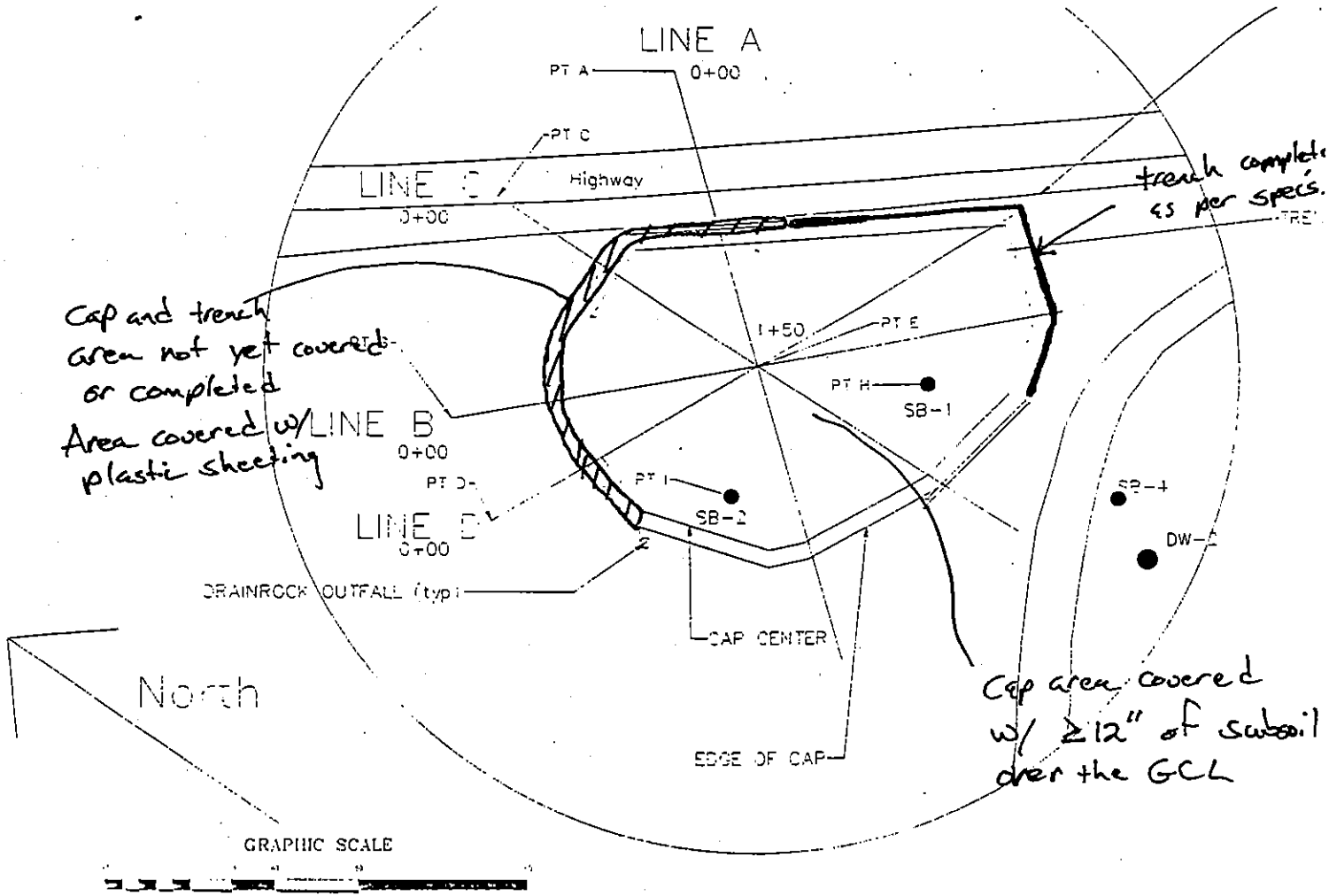
The trench on the southern half of the cap area was completed as per project specifications. The GCL was placed within the trench along with the non-woven filter fabric as detailed in the sketch below.



Note: workers working within the trench were required to wear coveralls and gloves, respirators were not worn due to the lack of dust which was due to the heavy rain. Personnell within the trenches were decontaminated at the day's end

AGRA E&E Field Rep. (Initials) JJ2 AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued X

Orouille Landfill Cap
6-914-10895 F.R. # 7
7/18/96 page 3 of 3



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DAILY FIELD REPORT

PROJECT NAME: Oroville Landfill Cap		PROJECT No.: 6914-10895	FIELD REPORT No.: # 8
LOCATION: Nighthawk Highway, Okanogan Co WA		DATE: 22 July 1996	PAGE: 1 OF 4
		ARRIVAL TIME: 0510	DAY OF WEEK: S S (M) T W T F
CLIENT OR OWNER: Bureau of Land Management	CLIENT OR OWNER'S REPRESENTATIVE / PHONE No.: Jake Jakabosky / (509) 536-1221		
GENERAL CONTRACTOR: Goodfellow Bros. Inc.	CONTRACTOR'S REPRESENTATIVE / PHONE No.: Kelly Ballard / (509) 670-1338 (mob#)		
SUBCONTRACTOR: —	SUBCONTRACTOR'S REPRESENTATIVE / PHONE No.: —		
AGRA E&E FIELD REPRESENTATIVE: Bill Lockard	AGRA E&E PROJECT MANAGER: Curt Thompson		
WEATHER: Clear 90's	EQUIPMENT USED: no change		

COMMENTS (Describe work completed during the day; any problems and their solutions)

Arrived on site at the client's request to provide construction observation and testing, and to perform the duties of the SSO as defined in the Health and Safety Plan dated June 1996. Today's activities are summarized below:

1) Final grading and compaction were performed on the subsoil placed over the ~~cap~~ GCL. The subsoil was graded such that positive drainage over the cap area was maintained.

2) We performed density testing upon the compacted subsoils, using a Campbell model MC-1, nuclear densometer in accordance with ASTM D2922 standards. We noted that the [redacted] subsoil placed over the GCL varied from the previous subsoil placed beneath the GCL. This material consisted of a tan, sandy SILT to silty fine to medium SAND with some gravel. We were informed by the BLM representative (Dave Rosekrance) that although the material had changed, another proctor analysis (~~[redacted]~~ ASTM-D698) was not necessary and that an estimated maximum density was sufficient. Thus density test

AGRA E&E Field Representative: [signature] AGRA E&E Project Manager: _____

Contractor's Representative: _____ Date: _____ Continued ☒

AGRA
Earth & Environmental

DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouille Landfill Cap	6-914-1895	8
	DATE 22 July 1996	PAGE 2 OF 4

COMMENTS (Describe work completed during the day; any problems and their solutions)

results which are attached, are estimated values. Based on our test results and our observations, it is our opinion the subsoils were compacted to a firm and unyielding condition.

3) Once compacted and density tested the ~~subsoils~~ were subsequently covered with topsoil.

4) The trench line along the northern half of the cap was completed as per project specifications. A 4-6" layer of topsoil was placed over the filter fabric to hold it in place and to protect it from UV damage.

5) Topsoil hauling and placement occurred throughout the day. By the day's end approximately 3/4 of the cap had been completed.

6) Workers decontaminated the vibratory drum roller on the decontamination pad by spraying it off with a fire hose. The remaining equipment is to be decontaminated tomorrow after hauling of the topsoil is completed.

7) Site clean-up began, with ~~the~~ refuse generated from construction activities gathered up for burial in the SE corner of the site (marked by the BLM).

8) Since all areas have now been capped, the required PPE has been reduced to standard construction PPE. However we indicated to the contractor that work outside the cap area ~~and~~ or the "capped" roadway should be minimized.

AGRA E&E Field Rep. (Initials) BZ AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued ☒

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DAILY FIELD REPORT

PROJECT NAME	PROJECT No.	FIELD REPORT No.
Orouille Landfill Cap	6-914-1885	8
	DATE 22 July 1996	PAGE 3 OF 4

SUMMARY OF FIELD COMPACTION TEST RESULTS

TEST No.	TEST METHOD	LOCATION	ELEV. (FEET)	DISTANCE BELOW GRADE	MAT'L TYPE	FIELD DRY DENSITY (PCF)	FIELD MOIST. (%)	FIELD COMP. (%) *	VARIATION FROM OPTIMUM MOIST. (%)	PASS OR FAIL
DT-8	N	See sketch			S-2	108	9	95		P
9						113	8	100		
10						114	9	100		
11						110	9	98		
12						111	8	99		
13						116	13	100		
14						119	7	100		
15						109	6	98		

PERCENT COMPACTION BASED ON:

☐ STANDARD PROCTOR ASTM D 698

☐ MODIFIED PROCTOR ASTM D 1557

☐ OTHER _____

SPECIFICATION:

☐ 90% D 698 ☐ 95% D 698

☐ 90% D 1557 ☐ 90% D 1557

☐ OTHER _____

MATERIAL TYPE	REFERENCE SAMPLE No.	MATERIAL DESCRIPTION	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOIST. (%)
	S-1	tan SILT w/ some clay	83	31
	S-2	tan silty SAND, sandy SILT w/ some gravel	112 *	
	* estimated			

TEST NUMBER

DT = DENSITY TEST

RT = RETEST

TEST METHOD

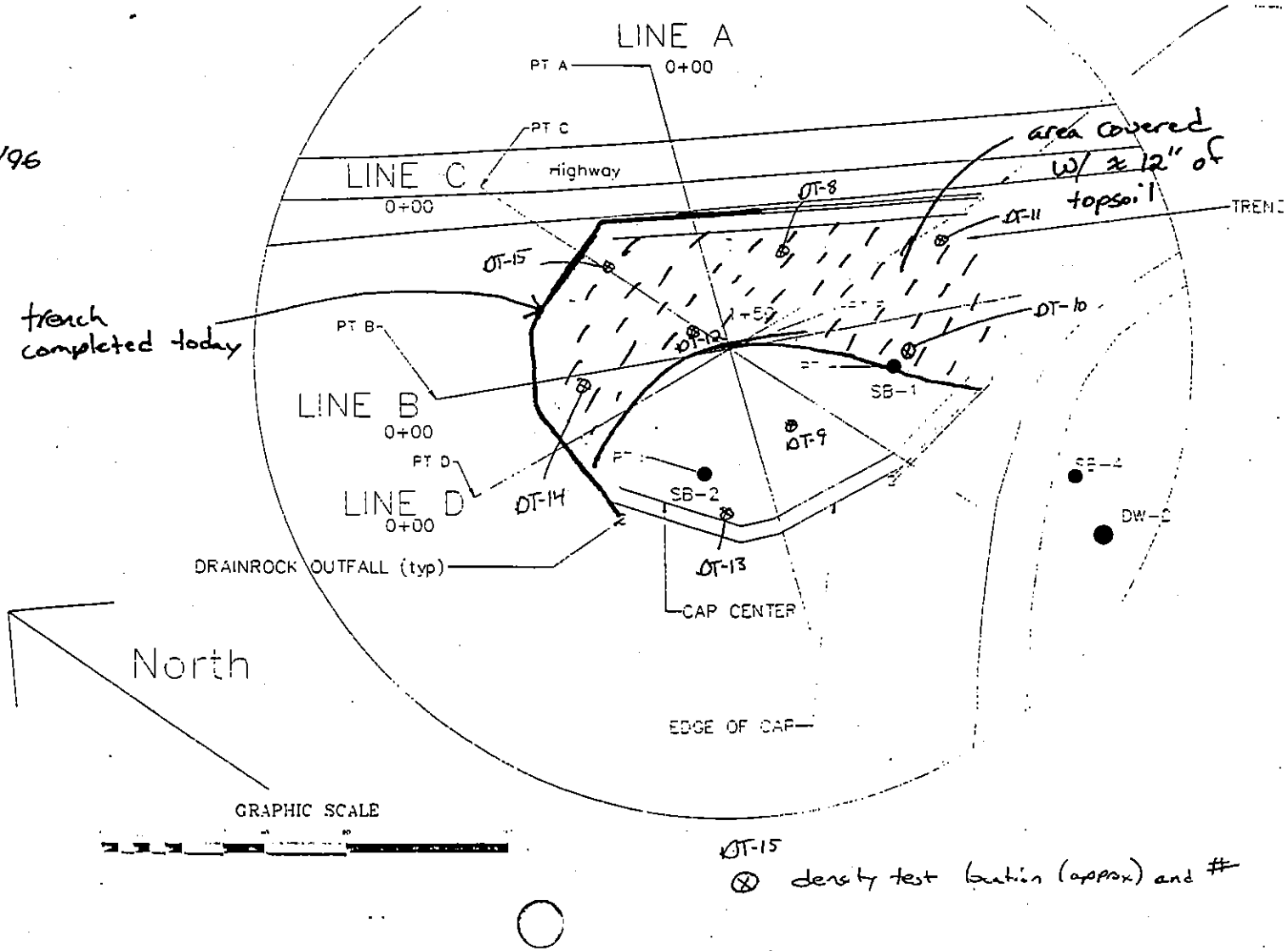
N = NUCLEAR (ASTM D 2922)

SC = SAND CONE (ASTM D 1556)

DC = DRIVE CYLINDER (ASTM D 2937)

AGRA E&E Field Rep. (Initials) _____ AGRA E&E Project Manager (Initials) _____ Contractor's Rep. (Initials) _____ Continued ☒

Orville Landfill Cap
G-914-10895 F.R. #8
page 4 of 4. 7/22/96



APPENDIX G

PHYSICAL LABORATORY TEST RESULTS

Agra Earth & Environmental
Oroville Landfill
Job No. 6-914-10895

Table 1: Flexible Wall Hydraulic Conductivity of Laboratory Remolded Specimen

Sample Identification	Water Content %		Wet Density[1] (Pcf)		Saturation[2]		Hydraulic Conductivity[3] (cm/sec)
	Before	After	Before	After	Before	After	
Oroville Landfill Cap S-1	33	36	107	114	0.82	0.98	1×10^{-4}

[1] Remolded to 97% of maximum dry density.
[2] Specific gravity assumed 2.65.
[3] Average Saturated Hydraulic Conductivity using tap water.

Table 2: Flexible Wall Hydraulic Conductivity Test Parameters

Exploration Number	Triaxial Pressure (psi)			Average Effective Confining Stress (psi)	Gradient (*i*)
	Cell	HW	TW		
Oroville Landfill Cap S-1	35	30	30	5	3

(*i*) = H/l
HW = Head Water
TW= Tail Water

APPENDIX H

SLUDGE AND DECONTAMINATION WASTEWATER ANALYTICAL TEST RESULTS

AGRA
Earth & Environmental

AGRA Earth &
Environmental, Inc.
11335 NE 122nd Way
Suite 100
Kirkland, Washington
U.S.A. 98034-6918
Tel (206) 820-4669
Fax (206) 821-3914

9 August 1996
6-914-10895-00

State of Washington
Department of Ecology
15 West Yakima Avenue
Yakima, Washington 98902

Attention: Mr. Jim Milton

Subject: Decontamination Wastewater Disposal
Oroville Landfill Cap
Oroville, Washington

Dear Mr. Milton:

This letter presents the analytical results from a water sample obtained from the on-site storage tank containing decontamination water. The wastewater was derived from decontamination efforts during recent construction activities at the closed Oroville landfill site on the Oroville-Nighthawk Highway, approximately 4 miles west of Oroville, Washington.

As indicated during our telephone conversation on 8 August 1996, AGRA Earth & Environmental, Inc. (AEE) is currently working under subcontract to Goodfellow Bros., Inc., the general contractor for the project. Goodfellow Bros., Inc. recently completed construction of a low-permeability cap over the pesticide contaminated area within the closed Oroville landfill for the property owners; the Bureau of Land Management (BLM). AEE provided Health and Safety monitoring during construction as well as sampling of the decontamination water at the end of construction activities.

During the course of the project the majority of the decontamination wastewater was generated by decontamination of the construction equipment. The water used for decontamination purposes was obtained from both the City of Oroville and the nearby Similkameen River. The decontamination procedure consisted of spraying off each piece of equipment, using a water truck, while on the decontamination pad. Washing of personal protective equipment and sampling equipment also generated minor amounts of decontamination wastewater. The decontamination water was collected and stored within a plastic tank on site, with a total of approximately 600 gallons of wastewater generated during the project. Approximately 150 gallons of decontamination wastewater was already present in the tank which had been generated during the remedial investigation phase of the project in 1992. Thus, a total of

750 gallons of wastewater is now present in the tank. Approximately 8-inches of sludge exists on the bottom of the storage tank, consisting primarily of mud and gravel.

We are proposing to dispose of the decontamination water at the Oroville wastewater treatment facility. The wastewater is to be decanted from the drum with the remaining sludge to be disposed of on site. We contacted the treatment plant superintendent, Mr. Rod Noel, concerning the disposal of the wastewater. After reviewing the analytical data for the wastewater, Mr. Noel indicated that the Department of Ecology needed to review the data and provide written approval before the wastewater could be accepted at the Oroville facility.

We have enclosed the analytical data for the wastewater sample obtained on 25 July 1996. The wastewater sample was analyzed for the following:

1. VOCs according to EPA Method 624
2. PAHs according to EPA Method 625 (BNA analysis)
3. Pesticides/PCBs according to EPA Method 608
4. RCRA Metals according to EPA Method Series 200 (Total inorganics)
5. TOX according to EPA Method 9020

Also enclosed is the analytical data and associated letter from Roy F. Weston, Inc. concerning sample results from the decontamination wastewater generated during remedial investigation activities in May 1992. The wastewater generated in 1992 was left in the onsite tank which was then used to also store the wastewater generated during the construction phase of the project in July 1996. The letter was sent to Mr. Phelps Freeborn, with the Department of Ecology who subsequently reviewed the data and sent a response to Mr. Rod Noel with the City of Oroville, approving the proposal to dispose of the wastewater at the treatment facility, a copy of which is also enclosed.

We appreciate your time to review this request. If you have any questions regarding the contents of this letter and analytical data, or require additional information, please do not hesitate to call.

Respectfully submitted,

AGRA Earth & Environmental, Inc.

William J. Lockard
Senior Staff Geologist

James S. Dransfield, P.E.
Vice President

WJL/JSD/caj

Enclosures: Analytical Test Results, sample S-1
Roy F. Weston, Inc. letter dated 26 May 1992
Department of Ecology letter dated 8 June 1992

cc: Tracy Gregg / Goodfellow Bros., Inc.
Jake Jakabowsky / Bureau of Land Management
Rod Noel / City of Oroville

ROY F. WESTON, INC.
201 ELLIOTT AVENUE WEST
SUITE 500
SEATTLE, WA 98119
PHONE: (206).286-6000

26 May 1992

Phelps Freeborn
Washington State
Department of Ecology
106 South 6th Avenue
Yakima, WA 98902

Subject: Disposal of Decontamination Wastewater

Dear Mr. Freeborn,

This letter is written in response to your request to review the analytical data derived from a sample of decontamination water generated during a Remedial Investigation (RI) at the closed Oroville Landfill. The landfill is located on the Oroville-Nighthawk Highway approximately 3 miles north of Oroville, Washington.

As you may recall, WESTON, Inc. is conducting the RI for the property owners, the Bureau of Land Management (BLM) and would like to dispose of the wastewater in the Oroville P.O.T.W. Please review the enclosed analytical data and advise Rod Noel, Oroville City Supervisor, on the disposal of this waste stream.

The decontamination wastewater consists of water used to decontaminate sampling equipment and personnel equipment, such as boots and gloves. Approximately 98% of this wastewater is comprised of the deionized water used to clean the equipment, however small amounts of soap, methanol, hexane, and hydrochloric acid were also used to enhance cleaning.

Table 1 is a printout of the analytical results for this sample, numbered "GW-WWT-92", and lists all of the chemicals analyzed, even if undetected. Analytes which have no information listed under concentration and qualifier were not analyzed for. Table 2 is an abbreviated "Hits Only" table for the same sample, and lists the fourteen analytes detected at levels above the instrument detection limit.

Sample GW-WWT-92 was analyzed according to the following analyses:

1. VOCs according to EPA Method 624
2. PAHs according to EPA Method 625 (BNA analysis)
3. Pesticide/PCBs according to EPA Method 608

4. RCRA Metals according to EPA Method Series 200 (Total Inorganics)
5. TOX according to EPA Method 9020

The qualifiers in Tables 1 and 2 indicate the following:

1. "U" indicates that the material was analyzed for, but was not detected.

2. "J" indicates that the analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or concentrations reported were less than the contract required detection limit (CRDL).

3. "BJ" indicates that the analyte was also found in the corresponding blank but at a level greater than five times the screening value.

Fourteen analytes and chemical types were detected in sample GW-WWT-92 and are in the parts per billion range.

If you require any additional information, please call me at (206) 286-6000.

Cordially,

Roy F. Weston, Inc.

Bill Beck
Project Scientist

cc: J. Jakabowsky; BLM COR
R. Noel; Oroville City Superintendent
K. Pine; WESTON, Inc. Project Manager

TABLE 1: FULL ANALYTICAL RESULTS

SAMPLE NUMBER: GW-WWT-02	NO. HITS	CONCENTRATION	QUALIFIER & UNITS
INORGANICS (TOTAL)			
Aluminum			
Antimony			
Arsenic	1	37.20000	J UG/L
Barium	1	447.00000	UG/L
Beryllium			
Cadmium	1	6.10000	UG/L
Calcium			
Chromium	1	68.50000	UG/L
Cobalt			
Copper			
Iron			
Lead	1	84.60000	UG/L
Magnesium			
Manganese			
Mercury		0.20000	JU UG/L
Nickel			
Potassium			
Selenium	1	9.00000	UG/L
Silver		3.40000	U UG/L
Sodium			
Thallium			
Vanadium			
Zinc			
CESIUM			
STRONTIUM			
MOLYBDENUM			
BNA'S			
Phenol		10.00000	U UG/L
bis(2-Chloroethyl)ether			
2-Chlorophenol		10.00000	U UG/L
1,3-Dichlorobenzene			
1,4-Dichlorobenzene		10.00000	U UG/L
Benzyl alcohol			
1,2-Dichlorobenzene			
2-Methylphenol			
2,2'-oxybis(1-Chloropropane)			
4-Methylphenol			
N-Nitroso-di-n-propylamine		10.00000	U UG/L
Hexachloroethane			
Nitrobenzene			
Isophorone			
2-Nitrophenol			
2,4-Dimethylphenol			
bis(2-Chloroethoxy)methane			
2,4-Dichlorophenol			
Benzoic acid			
1,2,4-Trichlorobenzene		10.00000	U UG/L
4-Chloroaniline			
Hexachlorobutadiene			
4-Chloro-3-methylphenol		10.00000	U UG/L

Hexachlorocyclopentadiene			
2,4,6-Trichlorophenol			
2,4,5-Trichlorophenol			
2-Chloronaphthalene			
2-Nitroaniline			
Dimethylphthalate			
2,6-Dinitrotoluene			
3-Nitroaniline			
2,4-Dinitrophenol			
4-Nitrophenol	50.00000	U	UG/L
Dibenzofuran			
2,4-Dinitrotoluene	10.00000	U	UG/L
Diethylphthalate			
4-Chlorophenyl-phenylether			
4-Nitroaniline			
4,6-Dinitro-2-methylphenol			
N-Nitrosodiphenylamine			
4-Bromophenyl-phenylether			
Hexachlorobenzene			
Pentachlorophenol	50.00000	U	UG/L
Carbazole			
Di-n-butylphthalate			
Pyrene	10.00000	U	UG/L
Butylbenzylphthalate			
3,3'-Dichlorobenzidine			
bis(2-Ethylhexyl)phthalate			
Di-n-octylphthalate			
Benzo(g,h,i)perylene	10.00000	U	UG/L
METHYLPHENOL			
ANILINE			
** 2-3 RING PAH's **			
Naphthalene	10.00000	U	UG/L
2-Methylnaphthalene			
Acenaphthylene	10.00000	U	UG/L
Acenapthene	10.00000	U	UG/L
Fluorene	10.00000	U	UG/L
Phenanthrene	10.00000	U	UG/L
Anthracene	10.00000	U	UG/L
Fluoranthene	10.00000	U	UG/L
** CARCINOGENIC PAH's **			
Benzo(a)anthracene	10.00000	U	UG/L
Chrysene	10.00000	U	UG/L
Benzo(b)fluoranthene	10.00000	U	UG/L
Benzo(k)fluoranthene	10.00000	U	UG/L
Benzo(a)pyrene	10.00000	U	UG/L
Indeno(1,2,3-cd)pyrene	10.00000	U	UG/L
Dibenz(a,h)anthracene	10.00000	U	UG/L
VOC'S			
Chloromethane	10.00000	U	UG/L
Bromomethane	10.00000	U	UG/L
Vinyl Chloride	10.00000	U	UG/L
Chloroethane	10.00000	U	UG/L
Methylene Chloride	5.00000	U	UG/L
Acetone	10.00000	U	UG/L
Carbon Disulfide	5.00000	U	UG/L

1,1-Dichloroethene		5.00000	U UG/L
1,1-Dichloroethane		5.00000	U UG/L
1,2-Dichloroethene (total)		5.00000	U UG/L
Chloroform		5.00000	U UG/L
1,2-Dichloroethane		5.00000	U UG/L
2-Butanone		10.00000	U UG/L
1,1,1-Trichloroethane		5.00000	U UG/L
Carbon Tetrachloride		5.00000	U UG/L
Bromodichloromethane		5.00000	U UG/L
1,2-Dichloropropane		5.00000	U UG/L
cis-1,3-Dichloropropene		5.00000	U UG/L
Trichloroethene		5.00000	U UG/L
Dibromochloromethane		5.00000	U UG/L
1,1,2-Trichloroethane		5.00000	U UG/L
Benzene		5.00000	U UG/L
Trans-1,3-Dichloropropene		5.00000	U UG/L
Bromoform		5.00000	U UG/L
4-Methyl-2-Pentanone		10.00000	U UG/L
2-Hexanone		10.00000	U UG/L
Tetrachloroethene		5.00000	U UG/L
1,1,2,2-Tetrachloroethane		5.00000	U UG/L
Toluene		5.00000	U UG/L
Chlorobenzene		5.00000	U UG/L
Ethylbenzene		5.00000	U UG/L
Styrene		5.00000	U UG/L
Xylenes (total)		5.00000	U UG/L
VINYL ACETATE			
TRANS-1,2-DICHLOROETHENE			
2-CHLORO			
2-CHLOROETHYL			
PESTICIDES/PCB			
alpha-BHC		0.05000	JU UG/L
beta-BHC		0.05000	BJU UG/L
delta-BHC		0.05000	JU UG/L
gamma-BHC (Lindane)		0.05000	JU UG/L
Heptachlor		0.05000	JU UG/L
Aldrin		0.05000	JU UG/L
Heptachlor epoxide	1	0.02000	J UG/L
Endosulfan I	1	0.03000	J UG/L
Dieldrin	1	2.10000	J UG/L
4,4'-DDE	1	0.51000	J UG/L
Endrin	1	0.07100	J UG/L
Endosulfan II	1	0.62000	J UG/L
4,4'-DDD		0.17000	BJU UG/L
Endosulfan sulfate		0.10000	JU UG/L
4,4'-DDT	1	0.73000	BJ UG/L
Methoxychlor		0.50000	JU UG/L
Endrin ketone		0.10000	JU UG/L
alpha-Chlordane		0.05000	JU UG/L
Endrin Aldehyde(3/90 Rev)		0.10000	JU UG/L
gamma-Chlordane		0.05000	JU UG/L
Toxaphene		5.00000	JU UG/L
Aroclor-1016		1.00000	JU UG/L
Aroclor-1221		2.00000	JU UG/L
Aroclor-1232		1.00000	JU UG/L

Aroclor-1242			1.00000	JU UG/L
Arochlor-1248			1.00000	JU UG/L
Aroclor-1254			1.00000	JU UG/L
Arochlor-1260			1.00000	JU UG/L
DICOFOL				
CHLORDANE				
CAPTAN				
TRIFLURALIN				
MIREX				
ISODRIN				
CARBOPHENOTHION				
DICHLORAN				
PCNB				
PERTHANE				
STROBANE				
TOTAL ORGANIC HALOGEN				
TOTAL ORGANIC HALOGEN		1	0.13000	J MG/L

TABLE 2: HITS ONLY LISTING

SAMPLE NUMBER: GW--WWT--92	No. HITS	CONCENTRATION	QUALIFIER & UNITS
INORGANICS (TOTAL)			
Arsenic	1	37.20000	J UG/L
Barium	1	447.00000	UG/L
Cadmium	1	6.10000	UG/L
Chromium	1	68.50000	UG/L
Lead	1	84.60000	UG/L
Selenium	1	9.00000	UG/L
BNA'S			
** 2--3 RING PAH's **			
** CARCINOGENIC PAH's **			
VOC'S			
PESTICIDES/PCB			
Heptachlor epoxide	1	0.02000	J UG/L
Endosulfan I	1	0.03000	J UG/L
Dieldrin	1	2.10000	J UG/L
4,4'--DDE	1	0.51000	J UG/L
Endrin	1	0.07100	J UG/L
Endosulfan II	1	0.62000	J UG/L
4,4'--DDT	1	0.73000	BJ UG/L
TOTAL ORGANIC HALOGEN			
TOTAL ORGANIC HALOGEN	1	0.13000	J MG/L

Director

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

106 South 6th Ave. • Yakima, Washington 98902-3387 • (509) 575-2490

June 8, 1992

Rod Noel, Superintendent
Town of Oroville
Post Office Box M
Oroville, WA 98844

Dear Mr. Noel:

I have reviewed the information Bill Beck of Roy F. Weston, Inc., provided regarding the request for disposal of wastewater from the monitoring wells, at the Oroville Landfill. From the information given, I can see no problems with approving their request.

In our telephone conversation, the volume of wastewater was estimated as 150 gallons. Using 300,000 gallons per day as a round number for the average flow at the plant, and a factor of two for the variation in flow from day to night, I estimate that plant flows are around 25,000 gallons per hour during the peak hour. In the absence of obvious toxic constituents, this would provide reasonable dilution if added to the influent over about a 15 minute period. If the volume is substantially more, the time taken to add the wastewater to the influent should be increased accordingly. If there are sediments in the bottom of the storage tank, they should NOT be stirred up and disposed of at the treatment plant but SHOULD BE dealt with as a solid waste (I am concerned that they might be rich in metals).

The final decision on whether to accept this wastewater is the Town's, the Water Quality program at Ecology sees no reason to object to the Town deciding to accept this waste for treatment.

Sincerely,

Phelps Freeborn
Water Quality Program

PF:ds

cc.: Ted Williams, Treatment Plant Operator
John Fahsholtz, Ecology Toxics Clean Up

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ■ (206) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

Correspondence to: 18939 - 120th Ave. NE, #101, Bothell, WA 98011

Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Project Summary

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
S-1	B607392-01	Water	7/23/96
S-2	B607392-02	Soil	7/23/96

North Creek Analytical, Inc.

Shannon J Stowell, Project Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

BOTHELL ■ (206) 481-9200 ■ FAX 485-2992
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Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Metals by EPA 200 Series Methods

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
S-1			B607392-01				Water	
Barium	6070675	7/24/96	7/25/96	EPA 200.7	0.0100	**0.148**	mg/l (ppm)	
Cadmium	"	"	"	EPA 200.7	0.00500	ND	"	
Chromium	"	"	"	EPA 200.7	0.0100	**0.0204**	"	
Arsenic	6070727	7/25/96	7/29/96	EPA 206.2	0.00400	**0.0696**	"	
Lead	6070746	"	"	EPA 239.2	0.00200	**0.0198**	"	
Mercury	6070660	"	7/25/96	EPA 245.1	0.00100	ND	"	
Selenium	6070727	"	7/29/96	EPA 270.2	0.00500	ND	"	
Silver	6070717	7/24/96	7/26/96	EPA 272.1	0.0200	ND	"	

North Creek Analytical, Inc.

Shannon J Stowell, Project Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

Offices:
BOTHELL ■ (206) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

Correspondence to: 18939 - 120th Ave. NE, #101, Bothell, WA 98011

Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Metals by EPA 6010/7000 Series Methods

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
S-2			B607392-02				Soil, dry wt.	
Arsenic	6070801	7/24/96	7/31/96	EPA 6010A	10.0	ND	mg/kg (ppm)	
Barium	"	"	"	EPA 6010A	0.500	**98.6**	"	
Cadmium	"	"	"	EPA 6010A	0.250	ND	"	
Chromium	"	"	"	EPA 6010A	0.500	**20.4**	"	
Lead	"	"	"	EPA 6010A	10.0	ND	"	
Selenium	"	"	"	EPA 6010A	7.50	ND	"	
Mercury	6070662	"	7/25/96	EPA 7471A	0.0500	ND	"	
Silver	6070680	"	"	EPA 7760A	1.00	**2.27**	"	

North Creek Analytical, Inc.

Shannon J Stowell, Project Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

Offices:
BOTHELL ■ (206) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

Correspondence to: 18939 - 120th Ave. NE, #101, Bothell, WA 98011

Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Organochlorine Pesticides and PCBs by EPA Method 608

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
S-1			B607392-01				Water	
Aldrin	6070667	7/25/96	7/26/96		0.0400	ND	ug/l (ppb)	
alpha-BHC	"	"	"		0.0200	ND	"	
beta-BHC	"	"	"		0.0300	ND	"	
delta-BHC	"	"	"		0.0200	ND	"	
gamma-BHC (Lindane)	"	"	"		0.0300	ND	"	
Chlordane (tech)	"	"	"		0.150	ND	"	
4,4'-DDD	"	"	"		0.0400	**0.0519**	"	
4,4'-DDE	"	"	"		0.0300	**0.0727**	"	
4,4'-DDT	"	"	"		0.0900	**0.169**	"	
Dieldrin	"	"	"		0.0700	ND	"	
Endosulfan I	"	"	"		0.0300	**0.0632**	"	
Endosulfan II	"	"	"		0.0500	**0.0950**	"	
Endosulfan sulfate	"	"	"		0.0700	ND	"	
Endrin	"	"	"		0.0800	ND	"	
Endrin aldehyde	"	"	"		0.0800	ND	"	
Heptachlor	"	"	"		0.0300	ND	"	
Heptachlor epoxide	"	"	"		0.0300	ND	"	
Methoxychlor	"	"	"		0.500	ND	"	
Toxaphene	"	"	"		1.50	ND	"	
Aroclor 1016	"	"	"		0.100	ND	"	
Aroclor 1221	"	"	"		0.100	ND	"	
Aroclor 1232	"	"	"		0.100	ND	"	
Aroclor 1242	"	"	"		0.100	ND	"	
Aroclor 1248	"	"	"		0.100	ND	"	
Aroclor 1254	"	"	"		0.100	ND	"	
Aroclor 1260	"	"	"		0.100	ND	"	
Surrogate: TCX	"	"	"	*40.0-130*		*88.4*	*%*	

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Correspondence to: 18939 - 120th Ave. NE, #101, Bothell, WA 98011

Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Purgeables by EPA Method 624

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
S-1			B607392-01				Water	
Benzene	6070683	7/25/96	7/25/96		1.00	ND	ug/l (ppb)	
Bromodichloromethane	"	"	"		1.00	ND	"	
Bromoform	"	"	"		1.00	ND	"	
Bromomethane	"	"	"		1.00	ND	"	
Carbon tetrachloride	"	"	"		1.00	ND	"	
Chlorobenzene	"	"	"		1.00	ND	"	
Chloroethane	"	"	"		1.00	ND	"	
Chloroform	"	"	"		1.00	ND	"	
Chloromethane	"	"	"		1.00	ND	"	
Dibromochloromethane	"	"	"		1.00	ND	"	
1,1-Dichloroethane	"	"	"		1.00	ND	"	
1,2-Dichloroethane	"	"	"		1.00	ND	"	
1,1-Dichloroethene	"	"	"		1.00	ND	"	
trans-1,2-Dichloroethene	"	"	"		1.00	ND	"	
1,2-Dichloropropane	"	"	"		1.00	ND	"	
cis-1,3-Dichloropropene	"	"	"		1.00	ND	"	
trans-1,3-Dichloropropene	"	"	"		1.00	ND	"	
Ethylbenzene	"	"	"		1.00	ND	"	
Methylene chloride	"	"	"		5.00	ND	"	
1,1,2,2-Tetrachloroethane	"	"	"		1.00	ND	"	
Tetrachloroethene	"	"	"		1.00	ND	"	
Toluene	"	"	"		1.00	ND	"	
1,1,1-Trichloroethane	"	"	"		1.00	ND	"	
1,1,2-Trichloroethane	"	"	"		1.00	ND	"	
Trichloroethene	"	"	"		1.00	ND	"	
Vinyl chloride	"	"	"		1.00	ND	"	
Surrogate: 1,2-DCA-d4	"	"	"	*76.0-114*		*88.8*	%	
Surrogate: Toluene-d8	"	"	"	*88.0-110*		*96.8*	"	
Surrogate: 4-BFB	"	"	"	*86.0-115*		*75.2*	"	*1*

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Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Acid and Base/Neutral Extractables by EPA Method 625

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
S-1			B607392-01				Water	
Acenaphthene	6070668	7/25/96	7/29/96		10.0	ND	ug/l (ppb)	
Acenaphthylene	"	"	"		10.0	ND	"	
Aniline	"	"	"		10.0	ND	"	
Anthracene	"	"	"		10.0	ND	"	
Benzidine	"	"	"		50.0	ND	"	
Benzoic Acid	"	"	"		10.0	ND	"	
Benzo (a) anthracene	"	"	"		5.00	ND	"	
Benzo (b) fluoranthene	"	"	"		5.00	ND	"	
Benzo (k) fluoranthene	"	"	"		5.00	ND	"	
Benzo (ghi) perylene	"	"	"		5.00	ND	"	
Benzo (a) pyrene	"	"	"		5.00	ND	"	
Benzyl alcohol	"	"	"		10.0	ND	"	
Bis(2-chloroethoxy)methane	"	"	"		10.0	ND	"	
Bis(2-chloroethyl)ether	"	"	"		10.0	ND	"	
Bis(2-chloroisopropyl)ether	"	"	"		10.0	ND	"	
Bis(2-ethylhexyl)phthalate	"	"	"		20.0	ND	"	
4-Bromophenyl phenyl ether	"	"	"		10.0	ND	"	
Butyl benzyl phthalate	"	"	"		5.00	ND	"	
4-Chloroaniline	"	"	"		5.00	ND	"	
2-Chloronaphthalene	"	"	"		10.0	ND	"	
4-Chloro-3-methylphenol	"	"	"		10.0	ND	"	
2-Chlorophenol	"	"	"		10.0	ND	"	
4-Chlorophenyl phenyl ether	"	"	"		10.0	ND	"	
Chrysene	"	"	"		5.00	ND	"	
Dibenzo (a,h) anthracene	"	"	"		5.00	ND	"	
Dibenzofuran	"	"	"		10.0	ND	"	
Di-n-butyl phthalate	"	"	"		5.00	ND	"	
1,3-Dichlorobenzene	"	"	"		5.00	ND	"	
1,4-Dichlorobenzene	"	"	"		5.00	ND	"	
1,2-Dichlorobenzene	"	"	"		5.00	ND	"	
3,3'-Dichlorobenzidine	"	"	"		10.0	ND	"	
2,4-Dichlorophenol	"	"	"		10.0	ND	"	
Diethyl phthalate	"	"	"		10.0	ND	"	
2,4-Dimethylphenol	"	"	"		10.0	ND	"	
Dimethyl phthalate	"	"	"		10.0	ND	"	
4,6-Dinitro-2-methylphenol	"	"	"		10.0	ND	"	
2,4-Dinitrophenol	"	"	"		10.0	ND	"	
2,4-Dinitrotoluene	"	"	"		10.0	ND	"	
2,6-Dinitrotoluene	"	"	"		10.0	ND	"	

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Acid and Base/Neutral Extractables by EPA Method 625

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
S-1 (continued)			**B607392-01**				**Water**	
Di-n-octyl phthalate	6070668	7/25/96	7/29/96		5.00	ND	ug/l (ppb)	
Fluoranthene	"	"	"		5.00	ND	"	
Fluorene	"	"	"		10.0	ND	"	
Hexachlorobenzene	"	"	"		10.0	ND	"	
Hexachlorobutadiene	"	"	"		5.00	ND	"	
Hexachlorocyclopentadiene	"	"	"		5.00	ND	"	
Hexachloroethane	"	"	"		10.0	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		5.00	ND	"	
Isophorone	"	"	"		10.0	ND	"	
2-Methylnaphthalene	"	"	"		10.0	ND	"	
2-Methylphenol	"	"	"		10.0	ND	"	
4-Methylphenol	"	"	"		10.0	ND	"	
Naphthalene	"	"	"		10.0	ND	"	
2-Nitroaniline	"	"	"		20.0	ND	"	
3-Nitroaniline	"	"	"		10.0	ND	"	
4-Nitroaniline	"	"	"		10.0	ND	"	
Nitrobenzene	"	"	"		10.0	ND	"	
2-Nitrophenol	"	"	"		10.0	ND	"	
4-Nitrophenol	"	"	"		10.0	ND	"	
N-Nitrosodiphenylamine	"	"	"		10.0	ND	"	
N-Nitrosodi-n-propylamine	"	"	"		10.0	ND	"	
Pentachlorophenol	"	"	"		10.0	ND	"	
Phenanthrene	"	"	"		10.0	ND	"	
Phenol	"	"	"		10.0	ND	"	
Pyrene	"	"	"		5.00	ND	"	
1,2,4-Trichlorobenzene	"	"	"		5.00	ND	"	
2,4,5-Trichlorophenol	"	"	"		10.0	ND	"	
2,4,6-Trichlorophenol	"	"	"		10.0	ND	"	
Surrogate: 2-FP	"	"	"	*21.0-100*		*94.5*	*%*	
Surrogate: Phenol-d6	"	"	"	*10.0-94.0*		*96.9*	"	*2*
Surrogate: 2,4,6-TBP	"	"	"	*10.0-124*		*134*	"	*2*
Surrogate: Nitrobenzene-d5	"	"	"	*35.0-114*		*73.7*	"	
Surrogate: 2-FBP	"	"	"	*43.0-116*		*74.8*	"	
Surrogate: p-Terphenyl-d14	"	"	"	*33.0-141*		*102*	"	

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Organochlorine Pesticides and PCBs by EPA Method 8081

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
S-2			B607392-02				Soil, dry wt.	
Aldrin	6070663	7/25/96	7/27/96		1.00	ND	ug/kg (ppb)	
alpha-BHC	"	"	"		0.500	ND	"	
beta-BHC	"	"	"		0.900	ND	"	
delta-BHC	"	"	"		0.600	ND	"	
gamma-BHC (Lindane)	"	"	"		1.00	ND	"	
Chlordane (tech)	"	"	"		1.00	ND	"	
4,4'-DDD	"	"	"		1.00	**194**	"	
4,4'-DDE	"	"	"		1.00	**145**	"	
4,4'-DDT	"	"	"		1.00	**57.9**	"	
Dieldrin	"	"	"		2.00	ND	"	
Endosulfan I	"	"	"		1.00	**53.3**	"	
Endosulfan II	"	"	"		2.00	**81.5**	"	
Endosulfan sulfate	"	"	"		1.00	**10.5**	"	
Endrin	"	"	"		2.00	ND	"	
Endrin aldehyde	"	"	"		2.00	ND	"	
Heptachlor	"	"	"		1.00	ND	"	
Heptachlor epoxide	"	"	"		1.00	ND	"	
Methoxychlor	"	"	"		4.00	ND	"	
Toxaphene	"	"	"		50.0	ND	"	
Aroclor 1016	"	"	"		50.0	ND	"	
Aroclor 1221	"	"	"		50.0	ND	"	
Aroclor 1232	"	"	"		50.0	ND	"	
Aroclor 1242	"	"	"		50.0	ND	"	
Aroclor 1248	"	"	"		50.0	ND	"	
Aroclor 1254	"	"	"		50.0	ND	"	
Aroclor 1260	"	"	"		50.0	ND	"	
Surrogate: TCX	"	"	"	*38.0-117*		*94.2*	*%*	

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Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Semivolatile Organic Compounds by EPA Method 8270

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
S-2			B607392-02				Soil, dry wt.	
Acenaphthene	6070661	7/25/96	8/1/96		0.200	ND	mg/kg (ppm)	
Phenol	"	"	"		0.200	ND	"	
Acenaphthylene	"	"	"		0.200	ND	"	
Aniline	"	"	"		0.200	ND	"	
Bis(2-chloroethyl)ether	"	"	"		0.200	ND	"	
2-Chlorophenol	"	"	"		0.200	ND	"	
Anthracene	"	"	"		0.200	ND	"	
1,3-Dichlorobenzene	"	"	"		0.200	ND	"	
Benzidine	"	"	"		0.500	ND	"	
1,4-Dichlorobenzene	"	"	"		0.200	ND	"	
1,2-Dichlorobenzene	"	"	"		0.200	ND	"	
Benzo (a) anthracene	"	"	"		0.200	ND	"	
Benzo (b) fluoranthene	"	"	"		0.200	ND	"	
Benzyl alcohol	"	"	"		0.200	ND	"	
2-Methylphenol	"	"	"		0.200	ND	"	
Benzo (k) fluoranthene	"	"	"		0.200	ND	"	
Benzo (ghi) perylene	"	"	"		0.200	ND	"	
Benzo (a) pyrene	"	"	"		0.200	ND	"	
Bis(2-chloroisopropyl)ether	"	"	"		0.200	ND	"	
N-Nitrosodi-n-propylamine	"	"	"		0.200	ND	"	
4-Methylphenol	"	"	"		0.200	**0.234**	"	
Hexachloroethane	"	"	"		0.200	ND	"	
Nitrobenzene	"	"	"		0.200	ND	"	
Bis(2-ethylhexyl)phthalate	"	"	"		1.00	**1.56**	"	
Isophorone	"	"	"		0.200	ND	"	
2-Nitrophenol	"	"	"		0.200	ND	"	
4-Bromophenyl phenyl ether	"	"	"		0.200	ND	"	
2,4-Dimethylphenol	"	"	"		0.200	ND	"	
Butyl benzyl phthalate	"	"	"		0.200	ND	"	
Bis(2-chloroethoxy)methane	"	"	"		0.200	ND	"	
Carbazole	"	"	"		0.200	ND	"	
4-Chloroaniline	"	"	"		0.200	ND	"	
Benzoic Acid	"	"	"		1.00	ND	"	
2-Chloronaphthalene	"	"	"		0.200	ND	"	
4-Chloro-3-methylphenol	"	"	"		0.200	ND	"	
4-Chlorophenyl phenyl ether	"	"	"		0.200	ND	"	
Chrysene	"	"	"		0.200	ND	"	
Dibenzo (a,h) anthracene	"	"	"		0.200	ND	"	
Dibenzofuran	"	"	"		0.200	ND	"	

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Semivolatile Organic Compounds by EPA Method 8270

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
S-2 (continued)			B607392-02				Soil, dry wt.	
Di-n-butyl phthalate	6070661	7/25/96	8/1/96		1.00	ND	mg/kg (ppm)	
3,3'-Dichlorobenzidine	"	"	"		1.00	ND	"	
2,4-Dichlorophenol	"	"	"		0.200	ND	"	
Diethyl phthalate	"	"	"		0.200	ND	"	
Dimethyl phthalate	"	"	"		0.200	ND	"	
4,6-Dinitro-2-methylphenol	"	"	"		1.00	ND	"	
2,4-Dinitrophenol	"	"	"		1.00	ND	"	
2,4-Dinitrotoluene	"	"	"		0.200	ND	"	
2,6-Dinitrotoluene	"	"	"		0.200	ND	"	
Di-n-octyl phthalate	"	"	"		0.200	ND	"	
Fluoranthene	"	"	"		0.200	ND	"	
Fluorene	"	"	"		0.200	ND	"	
Hexachlorobenzene	"	"	"		0.200	ND	"	
Hexachlorobutadiene	"	"	"		0.200	ND	"	
Hexachlorocyclopentadiene	"	"	"		0.200	ND	"	
Indeno (1,2,3-cd) pyrene	"	"	"		0.200	ND	"	
2-Methylnaphthalene	"	"	"		0.200	ND	"	
Naphthalene	"	"	"		0.200	ND	"	
2-Nitroaniline	"	"	"		1.00	ND	"	
3-Nitroaniline	"	"	"		1.00	ND	"	
4-Nitroaniline	"	"	"		1.00	ND	"	
4-Nitrophenol	"	"	"		1.00	ND	"	
N-Nitrosodiphenylamine	"	"	"		0.200	ND	"	
Pentachlorophenol	"	"	"		1.00	ND	"	
Phenanthrene	"	"	"		0.200	ND	"	
Pyrene	"	"	"		0.200	ND	"	
1,2,4-Trichlorobenzene	"	"	"		0.200	ND	"	
2,4,5-Trichlorophenol	"	"	"		1.00	ND	"	
2,4,6-Trichlorophenol	"	"	"		0.200	ND	"	
Surrogate: 2-FP	"	"	"	*21.0-100*		*112*	*%*	*2*
Surrogate: Phenol-d6	"	"	"	*10.0-94.0*		*98.2*	"	*2*
Surrogate: 2,4,6-TBP	"	"	"	*10.0-124*		*75.8*	"	
Surrogate: Nitrobenzene-d5	"	"	"	*35.0-114*		*62.7*	"	
Surrogate: 2-FBP	"	"	"	*43.0-116*		*89.5*	"	
Surrogate: p-Terphenyl-d14	"	"	"	*33.0-141*		*105*	"	

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
S-1			**B607392-01**				**Water**	
Total Organic Halides	6070704	7/26/96	7/26/96	EPA 9020	0.0200	**0.0204**	mg/l (ppm)	
S-2			**B607392-02**				**Soil, dry wt.**	
Extractable Organic Halides	6070654	7/25/96	7/25/96	EPA 9076 mod.	50.0	ND	mg/kg (ppm)	

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Dry Weight Determination

Sample Name	Lab ID	Matrix	Result	Units
S-2	B607392-02	Soil	66.2	%

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**Refer to end of report for text of notes.*

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Agra Earth and Environmental	Project: Oroville Landfill Cap.	Sar
11335 NE 122nd Way, Ste 100	Project Number: 6-914-10895	Rec
Kirkland, WA 98034	Project Manager: Curt Thompson	Rep

Metals by EPA 200 Series Methods
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits
Batch: 6070660	**Date Prepared: 7/25/96**					
Blank	**6070660-BLK1**				**Water**	
Mercury	7/25/96			ND	mg/l (ppm)	0.00100
Blank Spike	**6070660-BS1**				**Water**	
Mercury	7/25/96	0.00500		0.00537	mg/l (ppm)	70.0-130
Duplicate	**6070660-DUP1**		**B607408-01**		**Water**	
Mercury	7/25/96		ND	ND	mg/l (ppm)	
Matrix Spike	**6070660-MS1**		**B607408-01**		**Water**	
Mercury	7/25/96	0.00500	ND	0.00554	mg/l (ppm)	75.0-125
Matrix Spike Dup	**6070660-MSD1**		**B607408-01**		**Water**	
Mercury	7/25/96	0.00500	ND	0.00557	mg/l (ppm)	75.0-125
Batch: 6070675	**Date Prepared: 7/24/96**					
Blank	**6070675-BLK1**				**Water**	
Barium	7/25/96			ND	mg/l (ppm)	0.0100
Cadmium	"			ND	"	0.00500
Chromium	"			ND	"	0.0100
Blank Spike	**6070675-BS1**				**Water**	
Barium	7/25/96	2.00		1.49	mg/l (ppm)	70.0-130
Cadmium	"	1.00		0.754	"	70.0-130
Chromium	"	1.00		0.789	"	70.0-130
Duplicate	**6070675-DUP1**		**B607376-02**		**Water**	
Barium	7/25/96		0.0397	0.0417	mg/l (ppm)	
Cadmium	"		ND	ND	"	
Chromium	"		ND	ND	"	
Matrix Spike	**6070675-MS1**		**B607376-02**		**Water**	
Barium	7/25/96	2.00	0.0397	1.36	mg/l (ppm)	75.0-125
Cadmium	"	1.00	ND	0.635	"	75.0-125
Chromium	"	1.00	ND	0.649	"	75.0-125
Matrix Spike Dup	**6070675-MSD1**		**B607376-02**		**Water**	
Barium	7/25/96	2.00	0.0397	1.39	mg/l (ppm)	75.0-125

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Correspondence to: 18939 - 120th Ave. NE, #101, Bothell, WA 98011

Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Metals by EPA 200 Series Methods
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike Dup (continued)	**6070675-MSD1**		**B607376-02**		**Water**					
Cadmium	7/25/96	1.00	ND	0.642	mg/l (ppm)	75.0-125	64.2	20.0	1.10	3
Chromium	"	1.00	ND	0.649	"	75.0-125	64.9	20.0	0	3
Batch: 6070717	**Date Prepared: 7/24/96**									
Blank	**6070717-BLK1**				**Water**					
Silver	7/26/96			ND	mg/l (ppm)	0.0200				
Blank Spike	**6070717-BS1**				**Water**					
Silver	7/26/96	0.250		0.236	mg/l (ppm)	70.0-130	94.4			
Duplicate	**6070717-DUP1**				**Water**					
Silver	7/26/96			ND	mg/l (ppm)			20.0		
Matrix Spike	**6070717-MS1**				**Water**					
Silver	7/26/96	0.250		0.238	mg/l (ppm)	75.0-125	95.2			
Matrix Spike Dup	**6070717-MSD1**				**Water**					
Silver	7/26/96	0.250		0.237	mg/l (ppm)	75.0-125	94.8	20.0	0.420	
Batch: 6070727	**Date Prepared: 7/25/96**									
Blank	**6070727-BLK1**				**Water**					
Arsenic	7/29/96			ND	mg/l (ppm)	0.00400				
Selenium	"			ND	"	0.00500				
Blank Spike	**6070727-BS1**				**Water**					
Arsenic	7/29/96	0.0500		0.0531	mg/l (ppm)	70.0-130	106			
Selenium	"	0.0250		0.0269	"	70.0-130	108			
Duplicate	**6070727-DUP1**				**Water**					
Arsenic	7/29/96			ND	mg/l (ppm)			20.0		
Selenium	"			ND	"			20.0		
Matrix Spike	**6070727-MS1**				**Water**					
Arsenic	7/29/96	0.0500		0.0459	mg/l (ppm)	75.0-125	91.8			
Selenium	"	0.0250		0.0254	"	75.0-125	102			
Matrix Spike Dup	**6070727-MSD1**				**Water**					
Arsenic	7/29/96	0.0500		0.0482	mg/l (ppm)	75.0-125	96.4	20.0	4.77	

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Metals by EPA 200 Series Methods
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike Dup (continued)	6070727-MSD1				Water					
Selenium	7/29/96	0.0250		0.0283	mg/l (ppm)	75.0-125	113	20.0	10.3	
Batch: 6070746	Date Prepared: 7/25/96									
Blank	6070746-BLK1				Water					
Lead	7/29/96			ND	mg/l (ppm)	0.00200				
Blank Spike	6070746-BS1				Water					
Lead	7/29/96	0.0250		0.0305	mg/l (ppm)	70.0-130	122			
Duplicate	6070746-DUP1				Water					
Lead	7/29/96			ND	mg/l (ppm)			20.0		
Matrix Spike	6070746-MS1				Water					
Lead	7/29/96	0.0250		0.0284	mg/l (ppm)	75.0-125	114			
Matrix Spike Dup	6070746-MSD1				Water					
Lead	7/29/96	0.0250		0.0305	mg/l (ppm)	75.0-125	122	20.0	6.89	

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Metals by EPA 6010/7000 Series Methods
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 6070662	**Date Prepared: 7/24/96**									
Blank	**6070662-BLK1**				**Soil, dry wt.**					
Mercury	7/25/96			ND	mg/kg (ppm)	**0.0500**				
Blank Spike	**6070662-BS1**				**Soil, dry wt.**					
Mercury	7/25/96	0.250		0.266	mg/kg (ppm)	70.0-130	106			
Duplicate	**6070662-DUP1**		**B607392-02**		**Soil, dry wt.**					
Mercury	7/25/96		ND	ND	mg/kg (ppm)			20.0		
Matrix Spike	**6070662-MS1**		**B607392-02**		**Soil, dry wt.**					
Mercury	7/25/96	0.378	ND	0.486	mg/kg (ppm)	75.0-125	129			3
Matrix Spike Dup	**6070662-MSD1**		**B607392-02**		**Soil, dry wt.**					
Mercury	7/25/96	0.378	ND	0.478	mg/kg (ppm)	75.0-125	126	20.0	2.35	3
Batch: 6070680	**Date Prepared: 7/24/96**									
Blank	**6070680-BLK1**				**Soil, dry wt.**					
Silver	7/25/96			ND	mg/kg (ppm)	**1.00**				
Blank Spike	**6070680-BS1**				**Soil, dry wt.**					
Silver	7/25/96	12.5		11.3	mg/kg (ppm)	70.0-130	90.4			
Duplicate	**6070680-DUP1**		**B607392-02**		**Soil, dry wt.**					
Silver	7/25/96		2.27	1.51	mg/kg (ppm)			20.0	40.2	
Matrix Spike	**6070680-MS1**		**B607392-02**		**Soil, dry wt.**					
Silver	7/25/96	18.9	2.27	15.4	mg/kg (ppm)	75.0-125	69.5			3
Matrix Spike Dup	**6070680-MSD1**		**B607392-02**		**Soil, dry wt.**					
Silver	7/25/96	18.9	2.27	15.7	mg/kg (ppm)	75.0-125	71.1	20.0	2.28	3
Batch: 6070801	**Date Prepared: 7/24/96**									
Blank	**6070801-BLK1**				**Soil, dry wt.**					
Arsenic	7/31/96			ND	mg/kg (ppm)	**10.0**				
Barium	"			ND	"	**0.500**				
Cadmium	"			ND	"	**0.250**				
Chromium	"			ND	"	**0.500**				
Lead	"			ND	"	**10.0**				

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Metals by EPA 6010/7000 Series Methods
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Blank (continued)	6070801-BLK1				Soil, dry wt.					
Selenium	7/31/96			ND	mg/kg (ppm)	7.50				
Blank Spike	6070801-BS1				Soil, dry wt.					
Arsenic	7/31/96	50.0		41.9	mg/kg (ppm)	70.0-130	83.8			
Barium	"	50.0		83.2	"	70.0-130	166			
Cadmium	"	50.0		41.8	"	70.0-130	83.6			
Chromium	"	50.0		43.1	"	70.0-130	86.2			
Lead	"	50.0		41.9	"	70.0-130	83.8			
Selenium	"	50.0		38.8	"	70.0-130	77.6			
Duplicate	6070801-DUP1		B607443-01		Soil, dry wt.					
Arsenic	7/31/96		ND	ND	mg/kg (ppm)			20.0	0	
Barium	"		27.4	28.3	"			20.0	3.23	
Cadmium	"		ND	ND	"			20.0	0	
Chromium	"		15.5	15.4	"			20.0	0.647	
Lead	"		ND	ND	"			20.0	0	
Selenium	"		ND	ND	"			20.0	0	
Matrix Spike	6070801-MS1		B607443-01		Soil, dry wt.					
Arsenic	7/31/96		ND	33.2	mg/kg (ppm)	75.0-125	66.4			3
Barium	"		27.4	118	"	75.0-125	90.6			
Cadmium	"		ND	39.4	"	75.0-125	78.8			
Chromium	"		15.5	58.7	"	75.0-125	86.4			
Lead	"		ND	43.5	"	75.0-125	87.1			
Selenium	"		ND	41.2	"	75.0-125	82.4			
Matrix Spike Dup	6070801-MSD1				Soil, dry wt.					
Arsenic	7/31/96		ND	39.4	mg/kg (ppm)	75.0-125	78.8	20.0	17.1	
Barium	"		27.4	112	"	75.0-125	84.6	20.0	6.85	
Cadmium	"		ND	39.3	"	75.0-125	78.6	20.0	0.254	
Chromium	"		15.5	60.6	"	75.0-125	90.2	20.0	4.30	
Lead	"		ND	43.8	"	75.0-125	87.6	20.0	0.572	
Selenium	"		ND	34.7	"	75.0-125	69.4	20.0	17.1	3

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Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Organochlorine Pesticides and PCBs by EPA Method 608
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 6070667	**Date Prepared: 7/25/96**									
Blank	**6070667-BLK1**				**Water**					
Aldrin	7/26/96			ND	ug/l (ppb)	0.0400				
alpha-BHC	"			ND	"	0.0200				
beta-BHC	"			ND	"	0.0300				
delta-BHC	"			ND	"	0.0200				
gamma-BHC (Lindane)	"			ND	"	0.0300				
Chlordane (tech)	"			ND	"	0.150				
4,4'-DDD	"			ND	"	0.0400				
4,4'-DDE	"			ND	"	0.0300				
4,4'-DDT	"			ND	"	0.0900				
Dieldrin	"			ND	"	0.0700				
Endosulfan I	"			ND	"	0.0300				
Endosulfan II	"			ND	"	0.0500				
Endosulfan sulfate	"			ND	"	0.0700				
Endrin	"			ND	"	0.0800				
Endrin aldehyde	"			ND	"	0.0800				
Heptachlor	"			ND	"	0.0300				
Heptachlor epoxide	"			ND	"	0.0300				
Methoxychlor	"			ND	"	0.500				
Toxaphene	"			ND	"	1.50				
Aroclor 1016	"			ND	"	0.100				
Aroclor 1221	"			ND	"	0.100				
Aroclor 1232	"			ND	"	0.100				
Aroclor 1242	"			ND	"	0.100				
Aroclor 1248	"			ND	"	0.100				
Aroclor 1254	"			ND	"	0.100				
Aroclor 1260	"			ND	"	0.100				
Surrogate: TCX	"	*0.200*		*0.161*	"	*40.0-130*	*80.5*			
Blank Spike	**6070667-BS1**				**Water**					
Aldrin	7/26/96	0.250		0.255	ug/l (ppb)	45.0-143	**102**			
gamma-BHC (Lindane)	"	0.250		0.212	"	45.0-147	**84.8**			
Heptachlor	"	0.250		0.228	"	37.0-156	**91.2**			
Aroclor 1260	"	10.0		7.37	"	33.0-122	**73.7**			
Surrogate: TCX	"	*0.200*		*0.165*	"	*40.0-130*	*82.5*			
Blank Spike Dup	**6070667-BSD1**				**Water**					
Aldrin	7/26/96	0.250		0.259	ug/l (ppb)	45.0-143	**104**	36.0	1.94	

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Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Organochlorine Pesticides and PCBs by EPA Method 608
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Blank Spike Dup (continued)	**6070667-BSD1**				**Water**					
gamma-BHC (Lindane)	7/26/96	0.250		0.220	ug/l (ppb)	45.0-147	**88.0**	25.0	**3.70**	
Heptachlor	"	0.250		0.238	"	37.0-156	**95.2**	37.0	**4.29**	
Aroclor 1260	"	10.0		7.67	"	33.0-122	**76.7**	21.0	**3.99**	
Surrogate: TCX	"	*0.200*		*0.170*	"	*40.0-130*	*85.0*			

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
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Purgeables by EPA Method 624
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 6070683	**Date Prepared: 7/25/96**									
Blank	**6070683-BLK1**				**Water**					
Benzene	7/25/96			ND	ug/l (ppb)	1.00				
Bromodichloromethane	"			ND	"	1.00				
Bromoform	"			ND	"	1.00				
Bromomethane	"			ND	"	1.00				
Carbon tetrachloride	"			ND	"	1.00				
Chlorobenzene	"			ND	"	1.00				
Chloroethane	"			ND	"	1.00				
Chloroform	"			ND	"	1.00				
Chloromethane	"			ND	"	1.00				
Dibromochloromethane	"			ND	"	1.00				
1,1-Dichloroethane	"			ND	"	1.00				
1,2-Dichloroethane	"			ND	"	1.00				
1,1-Dichloroethene	"			ND	"	1.00				
trans-1,2-Dichloroethene	"			ND	"	1.00				
1,2-Dichloropropane	"			ND	"	1.00				
cis-1,3-Dichloropropene	"			ND	"	1.00				
trans-1,3-Dichloropropene	"			ND	"	1.00				
Ethylbenzene	"			ND	"	1.00				
Methylene chloride	"			ND	"	5.00				
1,1,2,2-Tetrachloroethane	"			ND	"	1.00				
Tetrachloroethene	"			ND	"	1.00				
Toluene	"			ND	"	1.00				
1,1,1-Trichloroethane	"			ND	"	1.00				
1,1,2-Trichloroethane	"			ND	"	1.00				
Trichloroethene	"			ND	"	1.00				
Vinyl chloride	"			ND	"	1.00				
Surrogate: 1,2-DCA-d4	"	*12.5*		*11.5*	"	*76.0-114*	*92.0*			
Surrogate: Toluene-d8	"	*12.5*		*11.9*	"	*88.0-110*	*95.2*			
Surrogate: 4-BFB	"	*12.5*		*11.0*	"	*86.0-115*	*88.0*			
Matrix Spike	**6070683-MS1**		**B607393-09**		**Water**					
Benzene	7/25/96	20.0	ND	18.4	ug/l (ppb)	85.0-114	92.0			
Chlorobenzene	"	20.0	ND	18.5	"	89.0-109	92.5			
1,1-Dichloroethene	"	20.0	ND	18.1	"	52.0-145	90.5			
Toluene	"	20.0	ND	18.2	"	87.0-112	91.0			
Trichloroethene	"	20.0	ND	18.3	"	87.0-113	91.5			
Surrogate: 1,2-DCA-d4	"	*12.5*		*12.6*	"	*76.0-114*	*101*			

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Purgeables by EPA Method 624
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike (continued)	**6070683-MS1**		**B607393-09**		**Water**					
Surrogate: Toluene-d8	*7/25/96*	*12.5*		*12.1*	*ug/l (ppb)*	*88.0-110*	*96.8*			
Surrogate: 4-BFB	"	*12.5*		*10.6*	"	*86.0-115*	*84.8*			*1*
Matrix Spike Dup	**6070683-MSD1**		**B607393-09**		**Water**					
Benzene	7/25/96	20.0	ND	18.3	ug/l (ppb)	85.0-114	91.5	10.0	0.545	
Chlorobenzene	"	20.0	ND	18.8	"	89.0-109	94.0	11.0	1.61	
1,1-Dichloroethene	"	20.0	ND	18.1	"	52.0-145	90.5	14.0	0	
Toluene	"	20.0	ND	18.0	"	87.0-112	90.0	12.0	1.10	
Trichloroethene	"	20.0	ND	18.0	"	87.0-113	90.0	10.0	1.65	
Surrogate: 1,2-DCA-d4	"	*12.5*		*12.6*	"	*76.0-114*	*101*			
Surrogate: Toluene-d8	"	*12.5*		*12.0*	"	*88.0-110*	*96.0*			
Surrogate: 4-BFB	"	*12.5*		*10.9*	"	*86.0-115*	*87.2*			

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Correspondence to: 18939 - 120th Ave. NE, #101, Bothell, WA 98011

Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Acid and Base/Neutral Extractables by EPA Method 625
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 6070668	**Date Prepared: 7/25/96**									
Blank	**6070668-BLK1**				**Water**					
Acenaphthene	7/29/96			ND	ug/l (ppb)	10.0				
Acenaphthylene	"			ND	"	10.0				
Aniline	"			ND	"	10.0				
Anthracene	"			ND	"	10.0				
Benzidine	"			ND	"	50.0				
Benzoic Acid	"			ND	"	10.0				
Benzo (a) anthracene	"			ND	"	5.00				
Benzo (b) fluoranthene	"			ND	"	5.00				
Benzo (k) fluoranthene	"			ND	"	5.00				
Benzo (ghi) perylene	"			ND	"	5.00				
Benzo (a) pyrene	"			ND	"	5.00				
Benzyl alcohol	"			ND	"	10.0				
Bis(2-chloroethoxy)methane	"			ND	"	10.0				
Bis(2-chloroethyl)ether	"			ND	"	10.0				
Bis(2-chloroisopropyl)ether	"			ND	"	10.0				
Bis(2-ethylhexyl)phthalate	"			ND	"	20.0				
4-Bromophenyl phenyl ether	"			ND	"	10.0				
Butyl benzyl phthalate	"			ND	"	5.00				
4-Chloroaniline	"			ND	"	5.00				
2-Chloronaphthalene	"			ND	"	10.0				
4-Chloro-3-methylphenol	"			ND	"	10.0				
2-Chlorophenol	"			ND	"	10.0				
4-Chlorophenyl phenyl ether	"			ND	"	10.0				
Chrysene	"			ND	"	5.00				
Dibenzo (a,h) anthracene	"			ND	"	5.00				
Dibenzofuran	"			ND	"	10.0				
Di-n-butyl phthalate	"			ND	"	5.00				
1,3-Dichlorobenzene	"			ND	"	5.00				
1,4-Dichlorobenzene	"			ND	"	5.00				
1,2-Dichlorobenzene	"			ND	"	5.00				
3,3'-Dichlorobenzidine	"			ND	"	10.0				
2,4-Dichlorophenol	"			ND	"	10.0				
Diethyl phthalate	"			ND	"	10.0				
2,4-Dimethylphenol	"			ND	"	10.0				
Dimethyl phthalate	"			ND	"	10.0				
4,6-Dinitro-2-methylphenol	"			ND	"	10.0				
2,4-Dinitrophenol	"			ND	"	10.0				

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Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Acid and Base/Neutral Extractables by EPA Method 625
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Blank (continued)	**6070668-BLK1**				**Water**					
2,4-Dinitrotoluene	7/29/96			ND	ug/l (ppb)	10.0				
2,6-Dinitrotoluene	"			ND	"	10.0				
Di-n-octyl phthalate	"			ND	"	5.00				
Fluoranthene	"			ND	"	5.00				
Fluorene	"			ND	"	10.0				
Hexachlorobenzene	"			ND	"	10.0				
Hexachlorobutadiene	"			ND	"	5.00				
Hexachlorocyclopentadiene	"			ND	"	5.00				
Hexachloroethane	"			ND	"	10.0				
Indeno (1,2,3-cd) pyrene	"			ND	"	5.00				
Isophorone	"			ND	"	10.0				
2-Methylnaphthalene	"			ND	"	10.0				
2-Methylphenol	"			ND	"	10.0				
4-Methylphenol	"			ND	"	10.0				
Naphthalene	"			ND	"	10.0				
2-Nitroaniline	"			ND	"	20.0				
3-Nitroaniline	"			ND	"	10.0				
4-Nitroaniline	"			ND	"	10.0				
Nitrobenzene	"			ND	"	10.0				
2-Nitrophenol	"			ND	"	10.0				
4-Nitrophenol	"			ND	"	10.0				
N-Nitrosodiphenylamine	"			ND	"	10.0				
N-Nitrosodi-n-propylamine	"			ND	"	10.0				
Pentachlorophenol	"			ND	"	10.0				
Phenanthrene	"			ND	"	10.0				
Phenol	"			ND	"	10.0				
Pyrene	"			ND	"	5.00				
1,2,4-Trichlorobenzene	"			ND	"	5.00				
2,4,5-Trichlorophenol	"			ND	"	10.0				
2,4,6-Trichlorophenol	"			ND	"	10.0				
Surrogate: 2-FP	"	*100*		*71.6*	"	*21.0-100*	*71.6*			
Surrogate: Phenol-d6	"	*100*		*77.2*	"	*10.0-94.0*	*77.2*			
Surrogate: 2,4,6-TBP	"	*100*		*115*	"	*10.0-124*	*115*			
Surrogate: Nitrobenzene-d5	"	*100*		*66.4*	"	*35.0-114*	*66.4*			
Surrogate: 2-FBP	"	*100*		*72.6*	"	*43.0-116*	*72.6*			
Surrogate: p-Terphenyl-d14	"	*100*		*101*	"	*33.0-141*	*101*			

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Acid and Base/Neutral Extractables by EPA Method 625
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Blank Spike	6070668-BS1				Water					
Acenaphthene	7/29/96	100		83.8	ug/l (ppb)	49.0-85.0	83.8			
4-Chloro-3-methylphenol	"	200		169	"	45.0-104	84.5			
2-Chlorophenol	"	201		166	"	42.0-84.0	82.6			
1,4-Dichlorobenzene	"	100		69.8	"	40.0-87.0	69.8			
2,4-Dinitrotoluene	"	100		83.6	"	42.0-106	83.6			
4-Nitrophenol	"	200		147	"	48.0-87.0	73.5			
N-Nitrosodi-n-propylamine	"	100		123	"	53.0-108	123			3
Pentachlorophenol	"	200		214	"	54.0-109	107			
Phenol	"	200		135	"	40.0-90.0	67.5			
Pyrene	"	100		70.2	"	53.0-92.0	70.2			
1,2,4-Trichlorobenzene	"	100		67.0	"	44.0-94.0	67.0			
Surrogate: 2-FP	"	*100*		*82.0*	"	*21.0-100*	*82.0*			
Surrogate: Phenol-d6	"	*100*		*57.6*	"	*10.0-94.0*	*57.6*			
Surrogate: 2,4,6-TBP	"	*100*		*144*	"	*10.0-124*	*144*			*2*
Surrogate: Nitrobenzene-d5	"	*100*		*75.0*	"	*35.0-114*	*75.0*			
Surrogate: 2-FBP	"	*100*		*81.2*	"	*43.0-116*	*81.2*			
Surrogate: p-Terphenyl-d14	"	*100*		*99.2*	"	*33.0-141*	*99.2*			
Blank Spike Dup	6070668-BSD1				Water					
Acenaphthene	7/29/96	100		74.8	ug/l (ppb)	49.0-85.0	74.8	17.0	11.3	
4-Chloro-3-methylphenol	"	200		158	"	45.0-104	79.0	42.0	6.73	
2-Chlorophenol	"	201		162	"	42.0-84.0	80.6	29.0	2.45	
1,4-Dichlorobenzene	"	100		73.2	"	40.0-87.0	73.2	34.0	4.76	
2,4-Dinitrotoluene	"	100		76.6	"	42.0-106	76.6	21.0	8.74	
4-Nitrophenol	"	200		127	"	48.0-87.0	63.5	39.0	14.6	
N-Nitrosodi-n-propylamine	"	100		121	"	53.0-108	121	17.0	1.64	3
Pentachlorophenol	"	200		192	"	54.0-109	96.0	41.0	10.8	
Phenol	"	200		121	"	40.0-90.0	60.5	26.0	10.9	
Pyrene	"	100		66.4	"	53.0-92.0	66.4	15.0	5.56	
1,2,4-Trichlorobenzene	"	100		66.6	"	44.0-94.0	66.6	29.0	0.599	
Surrogate: 2-FP	"	*100*		*78.4*	"	*21.0-100*	*78.4*			
Surrogate: Phenol-d6	"	*100*		*68.8*	"	*10.0-94.0*	*68.8*			
Surrogate: 2,4,6-TBP	"	*100*		*125*	"	*10.0-124*	*125*			*2*
Surrogate: Nitrobenzene-d5	"	*100*		*71.2*	"	*35.0-114*	*71.2*			
Surrogate: 2-FBP	"	*100*		*73.0*	"	*43.0-116*	*73.0*			
Surrogate: p-Terphenyl-d14	"	*100*		*108*	"	*33.0-141*	*108*			

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11335 NE 122nd Way, Ste 100	Project Number: 6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager: Curt Thompson	Reported: 8/1/96

Organochlorine Pesticides and PCBs by EPA Method 8081
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 6070663	**Date Prepared: 7/25/96**									
Blank	**6070663-BLK1**				Soil, dry wt.					
Aldrin	7/27/96			ND	ug/kg (ppb)	1.00				
alpha-BHC	"			ND	"	0.500				
beta-BHC	"			ND	"	0.900				
delta-BHC	"			ND	"	0.600				
gamma-BHC (Lindane)	"			ND	"	1.00				
Chlordane (tech)	"			ND	"	1.00				
4,4'-DDD	"			ND	"	1.00				
4,4'-DDE	"			ND	"	1.00				
4,4'-DDT	"			ND	"	1.00				
Dieldrin	"			ND	"	2.00				
Endosulfan I	"			ND	"	1.00				
Endosulfan II	"			ND	"	2.00				
Endosulfan sulfate	"			ND	"	1.00				
Endrin	"			ND	"	2.00				
Endrin aldehyde	"			ND	"	2.00				
Heptachlor	"			ND	"	1.00				
Heptachlor epoxide	"			ND	"	1.00				
Methoxychlor	"			ND	"	4.00				
Toxaphene	"			ND	"	50.0				
Aroclor 1016	"			ND	"	50.0				
Aroclor 1221	"			ND	"	50.0				
Aroclor 1232	"			ND	"	50.0				
Aroclor 1242	"			ND	"	50.0				
Aroclor 1248	"			ND	"	50.0				
Aroclor 1254	"			ND	"	50.0				
Aroclor 1260	"			ND	"	50.0				
Surrogate: TCX	"	*6.67*		*6.28*	"	*38.0-117*	*94.2*			
Matrix Spike	**6070663-MS1**		**B607392-02**		Soil, dry wt.					
Aldrin	7/27/96	12.6	ND	9.27	ug/kg (ppb)	35.0-138	73.6			
gamma-BHC (Lindane)	"	12.6	ND	11.6	"	44.0-137	92.1			
Heptachlor	"	12.6	ND	9.48	"	40.0-146	75.2			
Aroclor 1260	"	503	ND	332	"	37.0-98.0	66.0			
Surrogate: TCX	"	*10.1*		*9.66*	"	*38.0-117*	*95.6*			
Matrix Spike Dup	**6070663-MSD1**		**B607392-02**		Soil, dry wt.					
Aldrin	7/27/96	12.6	ND	9.49	ug/kg (ppb)	35.0-138	75.3	33.0	2.28	

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Organochlorine Pesticides and PCBs by EPA Method 8081
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike Dup (continued)	6070663-MSD1		B607392-02		Soil, dry wt.					
gamma-BHC (Lindane)	7/27/96	12.6	ND	12.5	ug/kg (ppb)	44.0-137	99.2	35.0	7.42	
Heptachlor	"	12.6	ND	8.61	"	40.0-146	68.3	32.0	9.62	
Aroclor 1260	"	503	ND	350	"	37.0-98.0	69.6	38.0	5.31	
Surrogate: TCX	"	*10.1*		*9.73*	"	*38.0-117*	*96.3*			

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Agra Earth and Environmental	Project: Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number: 6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager: Curt Thompson	Reported: 8/1/96

Semivolatile Organic Compounds by EPA Method 8270
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 6070661	**Date Prepared: 7/25/96**									
Blank	**6070661-BLK1**				**Soil, dry wt.**					
Acenaphthene	7/26/96			ND	mg/kg (ppm)	0.100				
Phenol	"			ND	"	0.100				
Acenaphthylene	"			ND	"	0.100				
Aniline	"			ND	"	0.100				
Bis(2-chloroethyl)ether	"			ND	"	0.100				
2-Chlorophenol	"			ND	"	0.100				
Anthracene	"			ND	"	0.100				
1,3-Dichlorobenzene	"			ND	"	0.100				
Benzidine	"			ND	"	0.250				
1,4-Dichlorobenzene	"			ND	"	0.100				
1,2-Dichlorobenzene	"			ND	"	0.100				
Benzo (a) anthracene	"			ND	"	0.100				
Benzo (b) fluoranthene	"			ND	"	0.100				
Benzyl alcohol	"			ND	"	0.100				
2-Methylphenol	"			ND	"	0.100				
Benzo (k) fluoranthene	"			ND	"	0.100				
Benzo (ghi) perylene	"			ND	"	0.100				
Benzo (a) pyrene	"			ND	"	0.100				
Bis(2-chloroisopropyl)ether	"			ND	"	0.100				
N-Nitrosodi-n-propylamine	"			ND	"	0.100				
4-Methylphenol	"			ND	"	0.100				
Hexachloroethane	"			ND	"	0.100				
Nitrobenzene	"			ND	"	0.100				
Bis(2-ethylhexyl)phthalate	"			ND	"	0.500				
Isophorone	"			ND	"	0.100				
2-Nitrophenol	"			ND	"	0.100				
4-Bromophenyl phenyl ether	"			ND	"	0.100				
2,4-Dimethylphenol	"			ND	"	0.100				
Butyl benzyl phthalate	"			ND	"	0.100				
Bis(2-chloroethoxy)methane	"			ND	"	0.100				
Carbazole	"			ND	"	0.100				
4-Chloroaniline	"			ND	"	0.100				
Benzoic Acid	"			ND	"	0.500				
2-Chloronaphthalene	"			ND	"	0.100				
4-Chloro-3-methylphenol	"			ND	"	0.100				
4-Chlorophenyl phenyl ether	"			ND	"	0.100				
Chrysene	"			ND	"	0.100				

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11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Semivolatile Organic Compounds by EPA Method 8270
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Blank (continued)	6070661-BLK1				Soil, dry wt.					
Dibenzo (a,h) anthracene	7/26/96			ND	mg/kg (ppm)	0.100				
Dibenzofuran	"			ND	"	0.100				
Di-n-butyl phthalate	"			ND	"	0.500				
3,3'-Dichlorobenzidine	"			ND	"	0.500				
2,4-Dichlorophenol	"			ND	"	0.100				
Diethyl phthalate	"			ND	"	0.100				
Dimethyl phthalate	"			ND	"	0.100				
4,6-Dinitro-2-methylphenol	"			ND	"	0.500				
2,4-Dinitrophenol	"			ND	"	0.500				
2,4-Dinitrotoluene	"			ND	"	0.100				
2,6-Dinitrotoluene	"			ND	"	0.100				
Di-n-octyl phthalate	"			ND	"	0.100				
Fluoranthene	"			ND	"	0.100				
Fluorene	"			ND	"	0.100				
Hexachlorobenzene	"			ND	"	0.100				
Hexachlorobutadiene	"			ND	"	0.100				
Hexachlorocyclopentadiene	"			ND	"	0.100				
Indeno (1,2,3-cd) pyrene	"			ND	"	0.100				
2-Methylnaphthalene	"			ND	"	0.100				
Naphthalene	"			ND	"	0.100				
2-Nitroaniline	"			ND	"	0.500				
3-Nitroaniline	"			ND	"	0.500				
4-Nitroaniline	"			ND	"	0.500				
4-Nitrophenol	"			ND	"	0.500				
N-Nitrosodiphenylamine	"			ND	"	0.100				
Pentachlorophenol	"			ND	"	0.500				
Phenanthrene	"			ND	"	0.100				
Pyrene	"			ND	"	0.100				
1,2,4-Trichlorobenzene	"			ND	"	0.100				
2,4,5-Trichlorophenol	"			ND	"	0.500				
2,4,6-Trichlorophenol	"			ND	"	0.100				
Surrogate: 2-FP	"	*3.34*		*2.86*	"	*21.0-100*	*85.6*			
Surrogate: Phenol-d6	"	*3.34*		*2.66*	"	*10.0-94.0*	*79.6*			
Surrogate: 2,4,6-TBP	"	*3.34*		*2.92*	"	*10.0-124*	*87.4*			
Surrogate: Nitrobenzene-d5	"	*3.34*		*2.97*	"	*35.0-114*	*88.9*			
Surrogate: 2-FBP	"	*3.34*		*2.37*	"	*43.0-116*	*71.0*			
Surrogate: p-Terphenyl-d14	"	*3.34*		*3.03*	"	*33.0-141*	*90.7*			

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BOTHELL ■ (206) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

Correspondence to: 18939 - 120th Ave. NE, #101, Bothell, WA 98011

Agra Earth and Environmental	Project:	Oroville Landfill Cap.	Sampled: 7/23/96
11335 NE 122nd Way, Ste 100	Project Number:	6-914-10895	Received: 7/24/96
Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Semivolatile Organic Compounds by EPA Method 8270
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike	6070661-MS1		B607392-02		Soil, dry wt.					
Acenaphthene	7/29/96	5.05	ND	4.25	mg/kg (ppm)	40.0-116	84.2			
Phenol	"	10.1	ND	8.48	"	45.0-108	84.0			
2-Chlorophenol	"	10.1	ND	9.40	"	37.0-104	93.1			
1,4-Dichlorobenzene	"	5.04	ND	3.14	"	20.0-109	62.3			
N-Nitrosodi-n-propylamine	"	5.04	ND	6.02	"	35.0-120	119			
4-Chloro-3-methylphenol	"	10.1	ND	8.06	"	45.0-105	79.8			
2,4-Dinitrotoluene	"	5.05	ND	3.71	"	16.0-104	73.5			
4-Nitrophenol	"	10.1	ND	5.30	"	21.0-93.0	52.5			
Pentachlorophenol	"	10.1	ND	9.04	"	18.0-123	89.5			
Pyrene	"	5.04	ND	4.61	"	35.0-143	91.5			
1,2,4-Trichlorobenzene	"	5.04	ND	3.26	"	31.0-118	64.7			
Surrogate: 2-FP	"	*5.05*		*4.03*	"	*21.0-100*	*79.8*			
Surrogate: Phenol-d6	"	*5.04*		*4.11*	"	*10.0-94.0*	*81.5*			
Surrogate: 2,4,6-TBP	"	*5.05*		*5.90*	"	*10.0-124*	*117*			
Surrogate: Nitrobenzene-d5	"	*5.04*		*3.14*	"	*35.0-114*	*62.3*			
Surrogate: 2-FBP	"	*5.04*		*3.89*	"	*43.0-116*	*77.2*			
Surrogate: p-Terphenyl-d14	"	*5.05*		*5.78*	"	*33.0-141*	*114*			
Matrix Spike Dup	6070661-MSD1		B607392-02		Soil, dry wt.					
Acenaphthene	7/29/96	5.05	ND	4.05	mg/kg (ppm)	40.0-116	80.2	19.0	4.87	
Phenol	"	10.1	ND	8.40	"	45.0-108	83.2	27.0	0.957	
2-Chlorophenol	"	10.1	ND	9.99	"	37.0-104	98.9	25.0	6.04	
1,4-Dichlorobenzene	"	5.04	ND	3.46	"	20.0-109	68.7	34.0	9.77	
N-Nitrosodi-n-propylamine	"	5.04	ND	6.04	"	35.0-120	120	17.0	0.837	
4-Chloro-3-methylphenol	"	10.1	ND	7.71	"	45.0-105	76.3	21.0	4.48	
2,4-Dinitrotoluene	"	5.05	ND	3.65	"	16.0-104	72.3	22.0	1.65	
4-Nitrophenol	"	10.1	ND	6.08	"	21.0-93.0	60.2	31.0	13.7	
Pentachlorophenol	"	10.1	ND	8.92	"	18.0-123	88.3	29.0	1.35	
Pyrene	"	5.04	ND	4.67	"	35.0-143	92.7	31.0	1.30	
1,2,4-Trichlorobenzene	"	5.04	ND	3.20	"	31.0-118	63.5	22.0	1.87	
Surrogate: 2-FP	"	*5.05*		*4.89*	"	*21.0-100*	*96.8*			
Surrogate: Phenol-d6	"	*5.04*		*4.47*	"	*10.0-94.0*	*88.7*			
Surrogate: 2,4,6-TBP	"	*5.05*		*5.88*	"	*10.0-124*	*116*			
Surrogate: Nitrobenzene-d5	"	*5.04*		*3.04*	"	*35.0-114*	*60.3*			
Surrogate: 2-FBP	"	*5.04*		*3.79*	"	*43.0-116*	*75.2*			
Surrogate: p-Terphenyl-d14	"	*5.05*		*6.08*	"	*33.0-141*	*120*			

North Creek Analytical, Inc.

Shannon J Stowell, Project Manager

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Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Conventional Chemistry Parameters by APHA/EPA Methods
Quality Control

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 6070654	**Date Prepared: 7/25/96**									
Blank	6070654-BLK1				Soil, dry wt.					
Extractable Organic Halides	7/25/96			ND	mg/kg (ppm)	50.0				
Blank Spike	6070654-BS1				Soil, dry wt.					
Extractable Organic Halides	7/26/96	2000		1680	mg/kg (ppm)	71.0-115	84.0			
Duplicate	6070654-DUP1		B607392-02		Soil, dry wt.					
Extractable Organic Halides	7/27/96		ND	ND	mg/kg (ppm)			24.0		
Matrix Spike	6070654-MS1		B607392-02		Soil, dry wt.					
Extractable Organic Halides	7/28/96	3020	ND	2270	mg/kg (ppm)	75.0-125	75.2			
Batch: 6070704	**Date Prepared: 7/26/96**									
Blank	6070704-BLK1				Water					
Total Organic Halides	7/26/96			ND	mg/l (ppm)	0.0200				
Blank Spike	6070704-BS1				Water					
Total Organic Halides	7/26/96	0.100		0.0993	mg/l (ppm)	84.0-118	99.3			
Duplicate	6070704-DUP1		B607392-01		Water					
Total Organic Halides	7/26/96		0.0204	0.0203	mg/l (ppm)			15.0	0.491	
Matrix Spike	6070704-MS1		B607392-01		Water					
Total Organic Halides	7/26/96	0.100	0.0204	0.121	mg/l (ppm)	80.0-120	101			

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Kirkland, WA 98034	Project Manager:	Curt Thompson	Reported: 8/1/96

Notes

#	Note
1	The surrogate recovery for this sample is outside of method established control limits due to matrix effect.
2	The surrogate recovery for this sample is outside of NCA established control limits due to matrix effect.
3	The spike recovery for this QC sample is outside of NCA established control limits due to matrix effect.

North Creek Analytical, Inc.

Refer to end of report for text of notes.

Shannon J Stowell, Project Manager

AGRA
Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918
Tel (206) 820-4669 Fax (206) 821-3914

01992

CHAIN OF CUSTODY

PROJECT: Orville Landfill Cap	PROJECT No.: 6-914-10895
CLIENT: Goodfellow Bros. Inc.	PHONE No.:
PROJECT MANAGER: Curt Thompson	PHONE No.: 820-4669
SAMPLER'S NAME (please print): Bill Lockard	PHONE No.: 820-4669
SAMPLER'S SIGNATURE: Bill Lockard	

ANALYSIS REQUESTED (circle, check box or write preferred method in box)

SAMPLE I.D.	DATE	TIME	MATRIX	PRESERVATIVE	CONTAINERS No.	CONTAINERS VOL.
1. S-1	7/23/96	1515	W			
2.						
3. S-2	7/23/96	1545	S	none	4	1l
4.						
5. BS-1	7/23/96	1500	S	none	2	1l
6.						
7.						
8.						
9.						
10.						

BTEX by EPA 602 / 8020	WTPH-G	BTEX / WTPH-G	WTPH-HCID	WTPH-D / WTPH-D EXTENDED	TPH by EPA 8015 MODIFIED	WTPH-418.1 MODIFIED	TPH by EPA 418.1	GC / MS EPA 624 / 8240 or EPA 8260 Volatiles	GC / MS EPA 625 / 8270 Semi-volatiles	VOCs ~~EPA 601 / 8010 or EPA 602 / 8020~~ EPA 624	Pesticides + PCBs EPA 608 / 8080	LEAD EPA 6010 / EPA 7421 Total / Dissolved	RCRA ~~TOTAL METALS~~ 200 Series	TCLP	TOX EPA 9020	~~Priority Pollutant~~ EPA 625	hold
										X	X		X		X	X	
										X	X		X		X	X	
																	X

Report both with & dry weight - Sludges

SAMPLE RECEIPT	LABORATORY	TURNAROUND TIME	SPECIAL INSTRUCTIONS / ADDITIONAL COMMENTS
TOTAL # CONTAINERS	SHIPPING I.D. / AIRBILL #	☐ 8 HOUR	Testing as per spec sheet faxed to Lee Canfield
CONDITION OF CONTAINERS	CARRIER	☐ 24 HOUR	
CONDITION OF SEALS	DOT DESIGNATION	☐ 1 WEEK	
		☐ 2 WEEK (standard)	
		X OTHER 5 day	5 day turnaround time need results 30 Monday 7/29 Tuesday per Bill Lockard 3° w/o custody seals.

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
1. Bill Lockard / AEE	7/24	814	1. Dana Hey NCA-5	7/24/96	0814
2.			2.		
3.			3.		

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