Remedial Design Document
for the Blake Court
and Black Material Areas
Former Solano County Sanitary Landfill
Benicia, California

June 29, 2001

prepared by
Northgate Environmental Management, Inc.
on behalf of
Granite Management Corporation

northgate
environmental
management, inc.

June 29, 2001

Darrell Nations, P.E., Project Manager
Department of Toxic Substances Control
Site Mitigation Program
8800 Cal Center Drive, 2nd Floor
Sacramento, California 95826-3107

Subject: Remedial Design Document for the Blake Court and Black Material Areas, Former Solano County Sanitary Landfill, Benicia, California

Dear Mr. Nations:

Enclosed are three copies of the Remedial Design Document prepared for the Remediation of the Blake Court and Black Material Areas, Former Solano County Sanitary Landfill. Northgate Environmental Management, Inc. has prepared this document on behalf of Granite Management Corporation The intent of this plan is to provide procedures to implement the Remedial Action Plan for the Site. This document addresses DTSC's comments on the Draft Remedial Design Document, which were provided to Ted Splitter of Northgate on May 30, 2001.

If there are any questions concerning this document, please contact the Project Coordinator, Mr. Ted Splitter, at (415) 492-0310.

Sincerely,

Alan Leavitt, P.E.
Project Engineer

Attachment

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ACRONYMS

BAAQMD	Bay Area Air Quality Management District
CCP	Community Contingency Plan
DTSC	Department of Toxic Substances Control
FS/PHERA	Feasibility Study and Public Health Evaluation of Remedial Alternatives
GAC	granular activated carbon
Granite	Granite Management Corporation
HSP	Health and Safety Plan
NCOU	North Canyon Operable Unit
NGVD	national geodetic vertical datum
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
RAO	Remedial Action Objective
RDD	Remedial Design Document
RI	Remedial Investigation
RWQCB	Regional Water Quality Control Board
SGETS	soil gas extraction and treatment system
ThOx	thermal oxidation unit
VOCs	volatile organic compounds

CERTIFICATION

All engineering information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by a Northgate Environmental Management, Inc. California Professional Engineer.

Alan L. Leavitt — June 29, 2001
Alan L. Leavitt
Principal Engineer
California Professional Engineer (49319)

Theodore Splitter — 6/29/01
Theodore Splitter
Principal Engineer
California Professional Engineer (29718)

1.0 INTRODUCTION AND BACKGROUND

This Remedial Design Document (RDD) has been prepared by Northgate Environmental Management, Inc. on behalf of Granite Management Corporation (Granite), for the former Solano County Sanitary Landfill (the "Site") located in Benicia, California (see Figures 1, 2 and 3). The purpose of the RDD is to describe the proposed remedial design and the implementation plan for Site, in accordance with the "Remedial Action Plan, Former Solano County Sanitary Landfill" ("RAP"; Northgate 2001).

The Site includes the North Canyon Operable Unit (NCOU) and Study Area Operable Unit (SOU) (Figure 2). As detailed in the RAP, the recommended alternatives for these areas are as follows:

Black Material Area. This sub-area is located near the intersection of Blake Court and Rose Drive and includes portions of three unoccupied lots. The preferred alternative (A-6) calls for initial soil gas extraction and treatment, followed by treatment of the subsurface Black Material in place to reduce potential odors and soil gas emissions, and to improve handling characteristics. The treatment process involves mixing Portland Cement and other components with the Black Material using large diameter mixing augers. Potential soil gas emissions generated during the mixing process will be collected within a hood placed over the soil mixing auger as it is rotated. The soil gas will be treated to meet applicable discharge requirements using activated carbon and a thermal oxidation unit and other emission control devices if necessary. After the Black Material is stabilized, it will be excavated and transported to an approved off-site disposal facility. Afterward, the excavation area will be backfilled and restored to its original surface elevation.

Blake Court Area. This area consists of seven undeveloped lots on Blake Court, a cul-de-sac intersecting with Rose Drive. The preferred alternative (B-5) calls for refuse and fill with fragments of refuse to be removed from a portion of Parcel C-1 and all of Blake Court. After excavation, this material will be transported to an approved facility for disposal. The resulting excavation areas will be backfilled with clean fill.

Creek Bed/Hydrocarbon Area. The preferred alternative (C-2) is no remedial action with ground water and soil gas monitoring.

Tank Area. The preferred alternative (D-3) is ground water monitoring. A removal action was previously completed in the Tank Area (approximately 0.08 acres) located in an undeveloped area off Cambridge Drive.

Study Area Operable Unit. The results of the Preliminary Endangerment Assessment showed that waste management practices did not result in a release or threatened release of hazardous substances that pose a threat to public health or the environment.

Remedial activities proposed for this portion of the Site are to install an additional soil-gas well at one location where an elevated methane concentration was detected below the ground surface and to further assess the location of a reported former underground fuel tank.

The RDD presents the methods for implementing the Black Material and Blake Court remedial activities, including details on equipment and methods of construction to be used at the Site. Construction drawings and specifications are provided under separate cover. The RDD includes the following information:

- Background information summarized from the "Remedial Investigation Report, North Canyon Operable Unit, Former Solano County Sanitary Landfill, Benicia, California," submitted to Department of Toxic Substances Control (DTSC) on March 17, 1997 ["RI Report"; LFR 1997a]) (Section 1)
- Description of remedial alternatives to be implemented, in accordance with the RAP (Section 2)
- Anticipated permitting requirements (Section 3)
- Description of related documents for remedial activities (Section 4)

1.1 Description and History

1.1.1 Physical Setting

The regional terrain in the Site vicinity consists of valleys with gently to moderately sloping hills that extend locally to an elevation of approximately 600 feet national geodetic vertical datum (NGVD). Ground-surface elevations generally range from about 185 feet NGVD, adjacent to Rose Drive, to 240 feet NGVD in the soil stockpile area. Predevelopment topographic contours and ground-surface elevation data were mapped by Greiner (formerly Bissell & Karn) of Fairfield, California (Greiner 1991). These data indicate that pre-filling and predevelopment topography included two valleys in this area. A creek, formerly located in the larger of the two valleys, ran under what is now the location of a section of Rose Drive and sloped down to the south; a tributary ravine ran under what is now the location of a cul-de-sac called Blake Court and sloped down to the west.

Predevelopment topographic contours and ground surface elevations indicate that portions of two valleys occupied the areas currently defined as the Black Material Area and the Blake Court Area. The valley beneath what is now Rose Drive was generally graded by filling in the lowest portion of the valley and level house pads were created perpendicular to the valley centerline. Houses were subsequently constructed on the fill except around Blake Court.

Surface-water flow is controlled by surface topography and man-made drainage structures (i.e., V-ditches, storm drains, curbs and gutters, and catch basins). Surface water either is intercepted by a drainage structure or infiltrates into soil. General surface-water flow directions are shown in Figure 3.

1.2.2 Site History

A portion of the Site area was operated as a sanitary landfill between approximately 1955 and 1979. The landfill was closed under Regional Water Quality Control Board (RWQCB) Orders 79-146 and 87-7. Pursuant to a plan of development approved by the City of Benicia, portions of the Site were developed for single-family residences.

The history of disposal practices at the Site is presented in "An Updated Historical Overview of Environmental Conditions at the North Canyon Area of the Former Solano County Sanitary Landfill." This document is included as Appendix B of the "Prior Investigations Report and Remedial Investigation Work Plan," dated June 7, 1996, and revised September 11, 1996 ("Remedial Investigation Work Plan"; LFR 1996a).

2.0 DESCRIPTION OF THE REMEDIAL ACTION- BLAKE COURT AND BLACK MATERIAL AREAS

The proposed remedial actions consist of implementing alternatives A-6, B-5, C-2, D-3, and the further investigation activities in the Study Area Operable Unit, as described in the RAP. This section discusses the proposed design for the implementation of Alternatives A-6 and B-5, and the methodology and construction schedule. Alternatives C-2 and D-3 consist of continued monitoring in the Creekbed and Tank sub-areas, respectively. The proposed monitoring plans for these areas are presented in Appendix A (in preparation). The proposed investigation plan for the Study Area Operable Unit is presented in Section 3.

Alternatives A-6 and B-5 will be implemented concurrently. The features of these alternatives are shown in Figures 4 through 8, and are summarized below.

- install security fences, abandon existing monitoring wells as necessary, and clear, grub, and rough grade portions of the proposed work area
- construct and operate a temporary soil gas extraction and treatment system (SGETS) for the Black Material Area
- remove the houses on Lots 50 and 51 to provide access to the work area
- construct access roads to the areas to be excavated
- excavate and stockpile approximately 25,000 cubic yards of clean overburden from Blake Court, a portion of Parcel C-1 and the Black Material Area (overburden soil in the Black Material Area will be excavated to within 3 feet of the Black Material)

- excavate and dispose of approximately 26,800 cubic yards of refuse and fill with fragments of refuse from Blake Court and from Parcel C-1
- mix stabilizing admixtures into the Black Material using mixing augers
- excavate and dispose of approximately 7,700 cubic yards of treated Black Material
- backfill the excavation areas with approximately 25,000 cubic yards of previously stockpiled clean overburden and additional soil from the proposed borrow site, if needed
- restore houses and landscaping

2.1 Preliminary Black Material Area Construction Activities

Before Black Material can be removed from the Site, a series of preliminary construction activities will be required. The following subsections describe these activities.

2.1.1 Soil Borings and Soil-Gas Pressure Tests

Before remediation work begins, additional soil borings will be drilled to provide detailed information on the limits of the Black Material and provide information for design of shoring. Borings will be drilled at the rear of the houses on Lots 49, 50, and 51, on Lot 47, and on Parcel C-1. The borings will be drilled with portable or truck-mounted drilling equipment, depending on available access. Samples will be taken as necessary to document the presence or absence of Black Material at the drilling locations.

Several of the above borings, as well as additional borings in the Black Material Area, will be completed as soil-gas extraction wells. Short-term pressure tests (30 minutes to 2 hours) will be performed by connecting a blower to selected soil-gas wells to estimate the radius of influence and measure soil gas flow rates. The extracted soil gas will be treated with granular activated carbon (GAC) before it is discharged to the air. The final number of soil-gas extraction wells and their spacing may be adjusted based on these field measurements, in consultation with DTSC.

2.1.2 Soil-Gas Extraction and Treatment System (SGETS) Installation and Operation

A temporary SGETS will be installed in the Work Area. The SGETS will be operated in two phases: (1) before soil stabilization activities; and (2) during soil stabilization activities. The SGETS will be operated prior to soil stabilization activities to reduce concentrations of methane, hydrogen sulfide, ammonia, and volatile organic compounds potentially present in the soil gas. During the soil stabilization activities, the SGETS will be operated to treat soil gas collected during the mixing process.

Prior to the in-situ soil stabilization activities, soil gas will be extracted from the Black Material Area via a network of soil gas extraction wells. Some existing soil-gas probes in the Black Material Area may be converted to extraction wells or air inlet wells to enhance SGETS operation, if appropriate, based on the construction and location of the probes. DTSC will be notified of field changes to the extraction system design. The piping from the wells to the soil-gas treatment system will be installed above grade and appropriately protected to minimize weathering and damage from construction activities in the area. The soil-gas transfer piping will be constructed of polyvinyl chloride (PVC) pipe. The pipe diameter will be selected based on the anticipated volume in the specific runs. For example, the main header may be 6-inch nominal diameter, while the runs to the individual wells may be 1-inch nominal diameter.

The SGETS will be designed to extract and effectively treat soil gas extracted from the Black Material Area. Air discharged from the SGETS will meet the BAAQMD air discharge limits specified in Table 1. The conceptual design of the SGETS is shown in Figure 8.

The soil gas will be extracted from the soil gas extraction wells by vacuum generated from a main blower located at the treatment compound. The main blower will be designed to extract up to 500 cubic feet per minute (cfm). Prior to the blower, the soil gas will be pre-treated. The pre-treatment system includes a vapor/liquid separator (S-1), and air filter (AF-1), and a dilution air inlet port. The extracted soil gas will flow through a vapor/liquid separator (S-1) to remove entrained liquid and condensation in the vapor stream. The separator will be equipped with a reservoir to collect the condensate. Both the separator and the reservoir will be fitted with a high liquid level switch to shut down the treatment system to prevent spillage of the collected condensate and prevent water from entering the blower and treatment system. The reservoir will be inspected and periodically drained to a 55-gallon drum or similar container. Water collected from the separator and reservoir will be analyzed for ammonia, H_2S, and other chemicals, as necessary to properly characterize and dispose of this waste water offsite. After the separator, the soil gas will flow through a particulate filter (AF-1) to remove dust or other solids in the vapor stream. In between the separator and the filter, a dilution air inlet will be installed in the process piping. Ambient air may be needed to dilute the chemical concentrations in the extracted soil gas for efficient treatment and/or to control the volume of soil gas extracted.

Flow rates and chemical concentration of extracted soil gas will be monitored at the influent to the SGETS (prior to the inlet for dilution air). These data will be used to calculate the total mass removal for the system.

Extracted soil-gas will be treated, as necessary, using either, or a combination of granular activated carbon adsorption (GAC) and thermal oxidation. The GAC system will be the primary treatment system. The GAC system will be designed to effectively remove VOCs, hydrogen sulfide, and ammonia from the extracted soil gas. The GAC system will also be used for odor control. The thermal oxidizer (ThOx) will be used as

a back-up treatment system in the event that further treatment or odor control is necessary.

The GAC system will include a minimum of three adsorbers configured in a lead/lag series. This configuration will maintain redundancy to treatment as well as support efficient usage of the GAC. Pressure and soil-gas temperature will be monitored between the adsorbers. Hydrogen sulfide and ammonia monitors will be installed after the GAC system and will initiate a system shutdown in the event either chemical is detected above discharge limits in the outlet vapor stream. This control will minimize discharge of those chemicals to the atmosphere in the event the GAC becomes spent. Chemical constituents in the inlet and outlet vapor streams for all three adsorbers will be monitored. When breakthrough occurs at the secondary adsorber, the third adsorber will be moved to the first position, and the GAC in the second and third adsorber positions will be replaced with fresh GAC.

The ThOx will be used, if necessary, to reduce the concentrations of methane and other combustible chemicals in the extracted soil gas. Propane will be used as make-up fuel to sustain combustion in the event that the ThOx is used. The propane tank will be located north of and outside of the treatment system enclosure. It will be located out of the way of traffic and heavy equipment and at a sufficient distance from the ThOx unit. The ThOx will be a skid- or trailer-mounted self-contained pre-piped unit with its own on-board controls. The control system for the extraction, GAC treatment, and ThOx will be interlocked so that all systems will be shut down in the event of an out-of-specification alarm.

The SGETS will be monitored daily by a technician. Process adjustments and samples will be collected at that time. A log of operation and maintenance activities will be maintained at the treatment system compound.

The SGETS will be operated for several weeks prior to intrusive activities at the Black Material Area. This approach will reduce the in-situ concentrations of chemicals in the Black Material Area soil gas and provide a safer working environment when the soil mixing and stabilization activities are performed. The SGETS will also be operated during the soil-mixing activities to collect and treat gases emitted during that process.

2.2 Construction Access Preparations

2.2.1 House Removal

To provide unrestricted access to the Black Material Area, the houses on Lots 50 and 51 will be removed, including all of the existing floor slab and foundations. These houses were surveyed for asbestos in accordance with Cal OSHA and BAAQMD requirements. Asbestos-containing linoleum was identified and removed by a certified asbestos abatement contractor. The materials were disposed of at an approved facility

and were not stored on-site. Landscaping, fencing, and other surface features also will be removed as necessary to provide access for the remedial activities.

2.2.2 Access Ramp Construction

There are substantial elevation differences across the project area. In addition, removal of the overburden and Black Material will result in excavations up to 30 feet in depth. In order to provide access for trucks and excavating equipment, two access ramps will be constructed (Figure 6). The Black Material will be accessed by a transition access ramp which will be located at the topographically lower portion of Blake Court and behind Lot 48. Additionally, a construction access ramp will be cut in Blake Court. Construction of the Black Material access ramp will result in a minor fill on Lot 48 and a cut into the existing grade in the area behind Lot 49. This area will be cut and filled in conjunction with the overburden removal activities discussed in Section 2.2.5. The access ramp will serve two purposes. First, it will allow access to the main Black Material Area. Second, it will facilitate excavation of overburden and Black Material from Lot 47, as shown in Figure 6.

The second access ramp will provide access to remove the Blake Court Refuse, as well as an alternative access route to remove Black Material, if necessary. The ramp will have a slope of approximately 15%. Building the access ramp will result in a cut into the existing landfill cover and refuse material. Overburden removed during construction of the ramp will be stockpiled in the area shown on Figure 4. Refuse removed during road construction will be temporarily stockpiled or immediately hauled off to an appropriate landfill. The road will be covered with base rock, and the side embankments will be sloped 1:1 or flatter between the roadbed and the surrounding ground surface.

2.2.3 Preparation of Stockpile Areas

Clean overburden soils will be stockpiled for reuse, and refuse and fill with fragments of refuse may also be stockpiled for profiling before disposal. The designated stockpile areas for overburden soil will be at the rear of Lots 42 through 45, as shown in Figure 4. The stockpiles will have a maximum height of up to 25 feet. Additional material may be stockpiled in the footprint of the Blake Court landfill. The designated stockpile areas will be cleared of vegetation and debris before the start of stockpiling activities. Vegetation and plant debris will be hauled off to an appropriate recycling facility or municipal landfill disposal facility.

2.2.4 Removal of Existing Overburden

Black Material. After removing the houses from Lots 50 and 51, as described in Section 2.2.1, the Black Material excavation area will be cleared and grubbed to remove surface vegetation, trees, and shrubs. Existing monitoring wells will be abandoned, as necessary. After clearing and grubbing, some of the overburden soil will

be removed using conventional earthmoving equipment such as front-end loaders, scrapers, or excavators. The soil will be direct-hauled or loaded into trucks for transport to the stockpile areas around Blake Court. The Black Material overburden will be removed to provide a level working platform, and to maintain a minimum 3-foot soil cover over the Black Material for maintenance of equipment support and for odor control. The overburden excavation plan is shown in Figure 6.

Blake Court Refuse and Fill with Fragments of Refuse. In conjunction with removing the Black Material overburden, the overburden in Blake Court and Parcel C-1 will be removed as indicated on Figure 6. These materials will be excavated using similar methods and equipment as for the Black Material overburden.

2.2.5 Install Temporary Shoring

A temporary shoring system will be constructed in Lots 48, 49 and 51 to allow removal of Black Material and Blake Court Refuse, as shown in Figure 4. Installation of the shoring will allow vertical cuts to be made while maintaining stable slopes in the work area.

2.3 Black Material Stabilization and Removal

2.3.1 In Situ Mixing and Stabilization

After the excavating and grading of overburden soils to create a working platform, the soil stabilization subcontractor will set up its batch plant and mobilize the mixing equipment. Equipment to be used includes a crane, a mixing auger(s) and hood for soil-gas collection, a bulldozer, a backhoe, and a forklift. Immediately before in situ mixing, additional overburden in some areas, including fill with fragments of refuse, will be excavated, separated, and taken and placed in the appropriate stockpiles at the Site. It is expected that in situ stabilization will begin at the northerly end of the Black Material Area and proceed in a southerly direction. Conventional construction materials used to stabilize soils will be added to the Black Material, in accordance with the treatability study previously completed for the Black Material Area (LFR, 1997b), as the auger is rotated and raised up and down. These construction materials include cement, lime, and fly ash. Potential soil-gas emissions from the Black Material will be collected and removed by the hood covering the mixing auger(s) and treated by the SGET as necessary to remove hydrogen sulfide, ammonia, methane, and other gases as previously described (see Section 2.1.2). The auger will be advanced in an overlapping pattern to allow complete stabilization of the Black Material.

The treated Black Material will be allowed to cure until it reaches the consistency of a stiff to very stiff clay before excavation begins. Based on the treatability study, the cure time is estimated to be approximately 10 to 30 days. During the cure period, a layer of visquene and a 1-foot-thick layer of gravel will be placed on the treated material. This

layer will separate excavation equipment from the treated material, control potential odors and create a working platform for subsequent excavation.

2.3.2 Excavation of Treated Black Material

After sufficient curing, the treated Black Material will be excavated as shown in Figure 7. A track-mounted excavator will be used to excavate the treated material and load it into trucks. Trucks will back into the Black Material Area from the Lot 48 access road to the active excavation area where they will be loaded. In accordance with the Transportation Plan (Northgate, 2001), the trucks will then pull to a staging area where the loads will be covered with a tarpaulin and the truck decontaminated, as necessary, before it leaves the work area. The trucks will stay on the gravel cover to reduce decontamination efforts and dust generation.

During the excavation and loading process, strict dust and odor control measures will be implemented, as discussed in the following section.

2.3.3 Dust and Odor Control Measures

Stringent dust and odor control will be implemented to reduce potential emissions of airborne particles and odors generated during in-situ stabilization and earthmoving operations. Construction personnel will follow the guidelines given in the project specific Health and Safety Plan (HSP) (Northgate, 2001), and in the construction specifications.

Spraying equipment will consist of a standard water truck or water pull with spray nozzles located approximately 4 feet above the ground surface. The spray nozzles can be adjusted to water the treated material from several different positions (i.e., from one side, or with a full rear spray). A spray hose will also be maintained at the work area to manually spray less accessible areas and to spray excavated material as it is loaded onto trucks. The spraying technique will consist of providing a medium fine spray over the material without over-watering and causing runoff. The material will be kept moist by spraying water on an as-needed basis. If spraying with water is inadequate to maintain dust control, dust palliatives or other methods of dust control may be used.

All overburden soil maintained at stockpile areas will be moistened, as necessary, or covered to reduce the potential for fugitive dust generation, and to assist in maintaining moisture content for later compaction.

Foam odor suppressants will be used as necessary to control odors during stabilization, excavation, and loading of the stabilized Black Material. The use of such foams is expected to adequately control emissions of ammonia and other odorous gases, if present. However, in the unlikely event that foam suppressants do not adequately control odors during the excavation and loading, then the excavation and loading area would be tented with a portable structure to further contain emissions. With this

contingency, the stabilized Black Material would be excavated and loaded under cover. The structure would be equipped with sliding or roll-up doors to control air flow when vehicles are not entering or leaving the structure. Air would be circulated through the portable structure and treated with activated carbon and other emission controls, as necessary, before discharge.

Air monitoring devices will be maintained in the work zone and at the work area perimeter to monitor air quality for comparison to the established action levels for the operation. Further details of the air monitoring program are described in the HSP and the Community Contingency Plan (CCP; Northgate, 2001).

2.3.4 Transportation and Disposal of Black Material

The trucks used for hauling the excavated Black Material to the disposal site will be decontaminated before leaving the work area. This decontamination may consist of washing the tires, flaps, and lower areas of any residual dust or soil material picked up during the loading operation. Water for decontamination will be obtained from a local fire hydrant, with City approval.

The trucks hauling excavated material from the Black Material Area will be covered at all times. Haul routes within Benicia will be restricted to Blake Court, Rose Drive, Columbus Parkway, and Interstate 780. City streets used as haul routes within Benicia will be wet-swept with a vacuum sweeper, as required, to keep the roads clean. Further details regarding transportation of soil and wastes are described in the Transportation Plan, prepared under separate cover (Northgate, 2001).

A signed hazardous or nonhazardous waste manifest will accompany each load to the disposal site. The anticipated disposal sites being considered are described in the Transportation Plan.

2.3.5 Confirmation Sampling

As material is removed from the Black Material and Parcel C-1 areas, confirmation samples will be obtained to document that Black Material, Blake Court Refuse, and fill with fragments of refuse have been completely removed from the excavation areas. Bottom confirmation soil sampling will be based on a grid with sampling location intervals of approximately 25 feet. Sidewall confirmation samples will be collected every 25 lineal feet in the depth range of the materials being removed.

Samples collected from the Blake Court and Parcel C-1 areas will be submitted to a state-certified laboratory for analyses of total cadmium, copper, lead, and nickel. Samples from the Black Material Area will be tested for total lead, nickel, and pentachlorophenol. Every tenth sample from this area will also be analyzed for 2,3,7,8-TCDD, which was detected in the Black Material area at levels slightly above RAOs. If the results for any of these substances are in excess of the remedial action

objectives (RAOs) as specified in Table 2 additional excavation will be performed followed by an additional round of confirmation sampling. This process will be repeated until the RAOs are achieved.

Additional details of the confirmation sampling process are presented in the FLPM/SAP.

2.4 Blake Court and Parcel C-1 Activities

2.4.1 Excavation of Blake Court Refuse and Fill With Fragments of Refuse

After the overburden has been removed from Blake Court and the designated portion of Parcel C-1, refuse and fill with fragments of refuse will be excavated from these locations, as shown in Figure 7. The Blake Court Refuse and fill with fragments of refuse will initially be removed using scrapers to excavate the materials and haul them to the stockpile area. As the excavation becomes deeper it may be necessary to use an excavator to top load the scrapers or trucks to remove the material. Dust control measures will be implemented as discussed in Section 2.3.3 above.

The Blake Court Refuse and fill with fragments of refuse may be stockpiled separately within the stockpile areas at the Site. After stockpiling, this material will be sampled to profile the material for disposal. Based on the results of the analytical profiling of the material, a permitted landfill will be selected for disposal. While the material is stockpiled, it will be kept covered as necessary to prevent generation of dust except for those locations where material is actively being placed. Water or dust palliatives may also be used, as necessary, to control dust. Alternatively, if the material can be characterized in place, all or a portion of this material may be directly loaded and off-hauled from the Site.

Confirmation sampling will be performed before backfilling, as discussed in Section 2.3.4 above.

2.4.2 Transportation and Disposal

Following acceptance for disposal by a landfill, the Blake Court Refuse and stockpiled fill with fragments of refuse will be loaded onto trucks for transportation to the landfill. The trucks used for hauling the Blake Court Refuse and fill with fragments of refuse to the disposal site will be decontaminated, as necessary, before leaving the stockpile area. This decontamination may consist of washing the tires, flaps, and lower areas of any residual dust or soil material picked up during the loading operation. Water for decontamination will be obtained from a local fire hydrant, with City approval. Traffic control procedures will be followed as described in the Transportation Plan, as summarized in Section 4.6.

2.5 Site Restoration Activities

2.5.1 Backfill and Compaction of Excavations

The excavations created by removal of the Black Material, Blake Court Refuse, fill with fragments of refuse, and overburden will be filled as the confirmation sampling results become available and show that these materials have been removed. Initial backfill will consist of the stockpiled overburden material, which has been analytically tested to verify that it is acceptable for use as backfill (i.e., meets RAOs).

Backfill will be placed in 8-inch maximum lifts and compacted with mechanical equipment including excavator-mounted compaction wheels or self-propelled sheepsfoot compactors. Each lift will be compacted to a minimum of 90% relative compaction. In Lots 49, 50, and 51, the fill will be compacted to 95% within 20 feet of the current locations of the houses. Water will be added as necessary to control dust and aid in achieving compaction. If the fill soils are too wet, the fill will be aerated until the moisture content is proper for compaction.

When the supply of previously excavated overburden is exhausted, additional clean soil from other approved sources will be used to restore the original grades.

2.5.2 Reconstruct Foundations Drainage and Landscaping

Following restoration of the grades on Parcel C-1 and Lot 51, the portion of the concrete V-ditch that was removed during the grading activities will be replaced. In addition, the catch basin and storm-drain pipe on Lot 51 will be restored.

After completing remedial activities and regrading the Site, the houses on Lots 50 and 51 will be rebuilt, and the areas disturbed by the remedial activities will be revegetated. Existing irrigation systems and decorative features will be restored. All graded areas will be revegetated by hydroseeding. Hydroseeding shall consist of mixing and applying seed, commercial fertilizer, stabilizing emulsions and other materials, with fiber and water. Specifications for hydroseeding are contained in Appendix B

2.6 Construction Schedule

The estimated project schedule is shown in Figure 9. Field construction activities will begin after obtaining required regulatory approvals and permits. Preliminary construction activities, including installation and operation of the SGETS, removing and stockpiling overburden fill, and related access preparation work, will require approximately six weeks to complete.

Subsequent remedial activities will be completed over the following 14 weeks. These activities will include stabilization, excavation, and disposal of Black Material, disposal

of Blake Court Refuse and fill with fragments of refuse, confirmation sampling, and backfilling the excavation areas.

All remaining construction activities, including restoration of the houses on Lots 50 and 51, re-landscaping the work area, and installation of erosion control measures, will be completed over approximately the following four months after backfilling.

3.0 STUDY AREA OPERABLE UNIT REMEDIAL ACTIVITIES

The PEA results showed that waste management practices have not resulted in a release or threatened release of hazardous substances that pose a threat to public health or the environment. Except for the activities noted below, no further actions are proposed to be undertaken with regard to the SAOU. Granite will work with the appropriate government agency with regard to the former underground fuel tank location discussed in the PEA and RAP. Additionally, an elevated methane concentration was previously detected in one soil-gas sample collected from a well near Lot 4. Follow-up soil-gas sampling at this same point detected no methane, and the initial results were considered anomalous. However, Granite plans to install a soil-gas well at or near the boring location where the elevated methane concentration was previously detected, in order to further monitor this area of the SAOU. The proposed location of this well is shown in Figure 2.

4.0 PERMITTING REQUIREMENTS

The FS Report (LFR, 1997b) evaluated the permits and regulatory agency approvals expected to apply to remedial alternatives in accordance with applicable or relevant and appropriate requirements and other factors. The following discussion describes the permits, which the local and state regulatory agencies are expected to require as part of the remedial design implementation.

4.1 City of Benicia

Construction permits will be obtained from the City of Benicia for the following activities:

- grading permit for removal of overburden soil, fill, and stabilized Black Material, and subsequent refilling of excavation areas.
- installation of the SGETS (building permit).
- removal of the houses on Lots 50 and 51 (building permit).
- erection of a portable structure, if necessary, when excavating stabilized Black Material (building permit).

- encroachment permit to cross sidewalk (two locations).

4.2 Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) regulates the operation of air pollution abatement devices. Implementation of the remedial plan will need to meet the following permits:

- **Authority To Construct and Permits To Operate.** These permits will need to be obtained for the SGETS prior to implementing the remediation. The proposed SGETS may be eligible for permitting under the BAAQMD's accelerated permit program.
- **BAAQMD Regulation 8, Rule 47, Air Stripping and Soil-Vapor Extraction.** Regulation 8-47 applies to air stripping and soil-vapor extraction equipment used to remediate soil or ground water containing (non-methane) organic compounds. Operations emitting over 1 pound per day of specified volatile organic compounds must treat the gas stream before discharge.

4.3 California Department of Toxic Substances Control

DTSC regulates the generation, storage, treatment, and disposal of hazardous wastes. No permits from DTSC are anticipated to be necessary to implement the remedial actions, including stabilization and removal of the Black Material, and excavation and disposal of the fill with fragments of refuse and Blake Court Refuse. Applicable regulatory requirements will be met concerning the transportation and disposal of all materials transported from the Site, based on waste classification criteria.

4.4 California Regional Water Quality Control Board

The RWQCB issues Waste Discharge Requirements pursuant to 23 California Code of Regulations (CCR) Division 3, Chapter 9, Articles 2 and 3. The RWQCB has issued Orders 79-146 and 87-07 for portions of the Site including the Blake Court Landfill. These requirements specify continued monitoring of soil gas, leachate, and groundwater, and implementation of corrective measures if necessary. The RWQCB is anticipated to modify or rescind existing orders following the completion of remedial activities.

4.5 California Occupational Safety and Health Administration

California Occupational Safety and Health Act (California Labor Code, Division 5), Excavation Permit (8 CCR Section 341) requires that a permit be obtained from California Occupational Safety and Health Administration for excavations greater than

5 feet deep that will be entered by employees. A permit will be obtained for the proposed excavations.

5.0 COMPANION DOCUMENTS

In addition to this RDD, various other documents relating to the proposed remedial activities have been prepared under separate cover. These documents are noted below, with descriptions of the key components relating to the proposed remedial work at the Site.

5.1 Construction Plans and Specifications

The detailed construction plans and specifications describe the proposed site work and related activities, which will be performed by the contractor(s) implementing the RAP. The construction plans and specifications will provide sufficient detail for the contractor to complete site preparation activities, earthwork, installation of SGETS components, soil mixing, and site restoration activities. The construction drawings include a site plan, excavation and grading plans, SGETS plans, utility layouts, electrical design, and additional details. These documents also specify the administrative and contractual procedures that will be followed by the contractor and Granite when implementing the remedial work.

5.2 Public Participation Plan

The Public Participation Plan establishes the program, activities, and communication procedures to keep residents well-informed as remediation activities are implemented. This plan provides opportunities for residents to ask questions and comment on the project. In accordance with the plan, a pre-construction notice will be distributed to the public to summarize proposed remedial activities.

5.3 Community Contingency Plan (CCP)

The CCP (Northgate, 2001) describes contingent procedures to protect the health and safety of the community during implementation of the remediation activities. This document presents the emergency planning and response procedures to be implemented if an emergency condition occurs while performing site cleanup actions. Through these procedures, appropriate resources can be identified and made available to respond effectively to potential incidents.

The CCP identifies types of emergency conditions, the roles and responsibilities of various entities, including public agencies and private parties, air monitoring procedures and community action levels, and related details for contingency planning purposes.

5.4 The Health and Safety Plan

The HSP (Northgate, 2001) describes the measures, which will be used to control potential health and safety risks to workers implementing the remedial design. The HSP describes the work areas for the project, identifies key project personnel and responsibilities, security and control of the work area, an analysis of potential hazards, procedures to mitigate hazards in the work area, medical monitoring and training requirements, and other details related to worker health and safety. Contractors implementing the remedial work will prepare their own HSP, however, their plan must be at least as stringent as the HSP requirements contained in the Northgate HSP.

5.5 Field and Laboratory Procedures Manual

The Field and Laboratory Procedures Manual (LFR 1995), as updated for this project, addresses the quality assurance/quality control (QA/QC) procedures for field work and laboratory analyses implemented at the NCOU. This document will apply for the sampling activities and field measurements performed as part of the remedial design implementation. These procedures include collection and handling of samples, QA/QC procedures, calibration of field instruments, preventive maintenance of equipment, and other related procedures.

5.6 Transportation Plan

The Transportation Plan (Northgate, 2001) addresses the procedures, regulations, and other requirements related to transportation of materials and equipment as part of the remedial design implementation. This plan will identify the procedures for controlling traffic, proposed transportation routes, loading and decontamination procedures, and other details related to remedial design implementation.

5.7 Soil-Gas and Water Monitoring Plan

The soil gas, groundwater and subdrain monitoring activities that will be conducted at the Former Solano County Sanitary Landfill (the Site) in accordance with the approved Feasibility Study and Remedial Action Plan for the Site included the following components:

- Treatment and offsite disposal of Black Material (Alternative A-6).
- Excavation and offsite disposal of Blake Court Refuse and Fill with Fragments of Refuse from a portion of Parcel C-1 (Alternative B-5).
- Continued monitoring in vicinity of Creek Bed/Hydrocarbon Area (Alternative C-2).
- Continued monitoring in vicinity of Tank Area (Alternative D-3).

Groundwater and soil-gas monitoring will no longer be required for the Blake Court and Black Material Areas, since all wastes in these areas will be removed and disposed offsite.

The Feasibility Study specified monitoring for five years in the Creek Bed/Hydrocarbon Area and Tank Areas. This monitoring program has been implemented for four years since the Feasibility Study was approved. After the five-year period is over, the monitoring results will be assessed and the schedule may be adjusted or curtailed, after obtaining the appropriate regulatory approvals.

The monitoring program for soil gas, groundwater and subdrain water is presented in Appendix A.

6.0 REFERENCES

Greiner (formerly Bissell & Karn). 1991. Topographic Survey. November 6.

Levine•Fricke•Recon. 1995. Field and Laboratory Procedures Manual for Investigation/Remediation Activities at the Former Solano County Sanitary Landfill, Benicia, California. May 26.

_____. 1996. Prior Investigations Report and Remedial Investigation Work Plan, North Canyon OU, Former Solano County Sanitary Landfill, Benicia, California. June 7.

_____. 1997a. Remedial Investigation Report, North Canyon Operable Unit, Former Solano County Sanitary Landfill, Benicia, California. Volumes I and II. March 17. Revised April 30.

_____. 1997b. Feasibility Study and Public Health Evaluation of Remedial Alternatives, North Canyon Operable Unit, Former Solano County Sanitary Landfill, Benicia, California. April 18.

Northgate Environmental Management, Inc. (Northgate). 2001. Remedial Action Plan, Former Solano County Sanitary Landfill, Benicia, California. June 25.

_____. 2001. Health and Safety Plan for the Remediation of the Blake Court and Black Material Areas, Former Solano County Sanitary Landfill, Benicia, California. June 29.

_____. 2001. Community Contingency Plan for the Remediation of the Blake Court and Black Material Areas, Former Solano County Sanitary Landfill, Benicia, California. June 29.

_____. 2001. Transportation Plan for the Remediation of the Blake Court and Black Material Areas, Former Solano County Sanitary Landfill, Benicia, California. June 29.

TABLE 1: BAAQMD AIR DISCHARGE LIMITS

Compound	Air Discharge Limits[a]
H_2S	0.5 g/m^3
Ammonia	1.2 g/m^3
HCN	0.82 g/m^3
Methane [b]	Not regulated

NOTES

(a) Air Discharge limits are based on an estimated flow rate of 500 scfm and the annual mass discharge limit specified in BAAQMD Regulation 2, Rule 1.

(b) BAAQMD has not established numerical discharge limits for methane.

Abbreviations:

BAAQMD – Bay Area Air Quality Management District
HCN – hydrogen cyanide
H_2S – Hydrogen sulfide
scfm – standard cubic feet per minute

Table 2. Remedial Action Objectives For Soil

(0 TO 12.5 FEET BGS)

(milligrams per liter)

CHEMICAL	RAO [1] (mg/kg)	SUBAREA (mg/kg)			
		Black Material Area		Blake Court Area	
		Max. Conc. [2]	Max.>RAO	Max. Conc. [2]	Max.>RAO
Antimony	28.4	7	No	ND	No
Barium	2,350	1,900	No	828	No
Cadmium	8.9	6.4	No	9.74	Yes
Chromium	78,100	15,000	No	502	No
Copper	2,640	1,700	No	7,590	Yes
Lead	130	2,900	Yes	1,650	Yes
Nickel	148	280	Yes	180	Yes
Zinc	21,300	6,300	No	6,490	No
p-Cresol	195	66	No	ND	No
Pentachlorophenol	16.1	20	Yes	ND	No
2,3,7,8,-TCDD (TEQ)	0.001	0.0017	Yes	0.000013	No

Notes

bgs - below ground surface

ND - not detected

NA - not analyzed

TEQ - toxicity equivalent units

(1) RAOs are equivalent to site specific soil screening values developed in the BHRA (ChemRisk, 1997).

(2) Average concentrations of these chemicals generally are much lower than the maximum detected values. The maximum detected values thus provide a very conservative indicator of conditions which could require remedial actions.

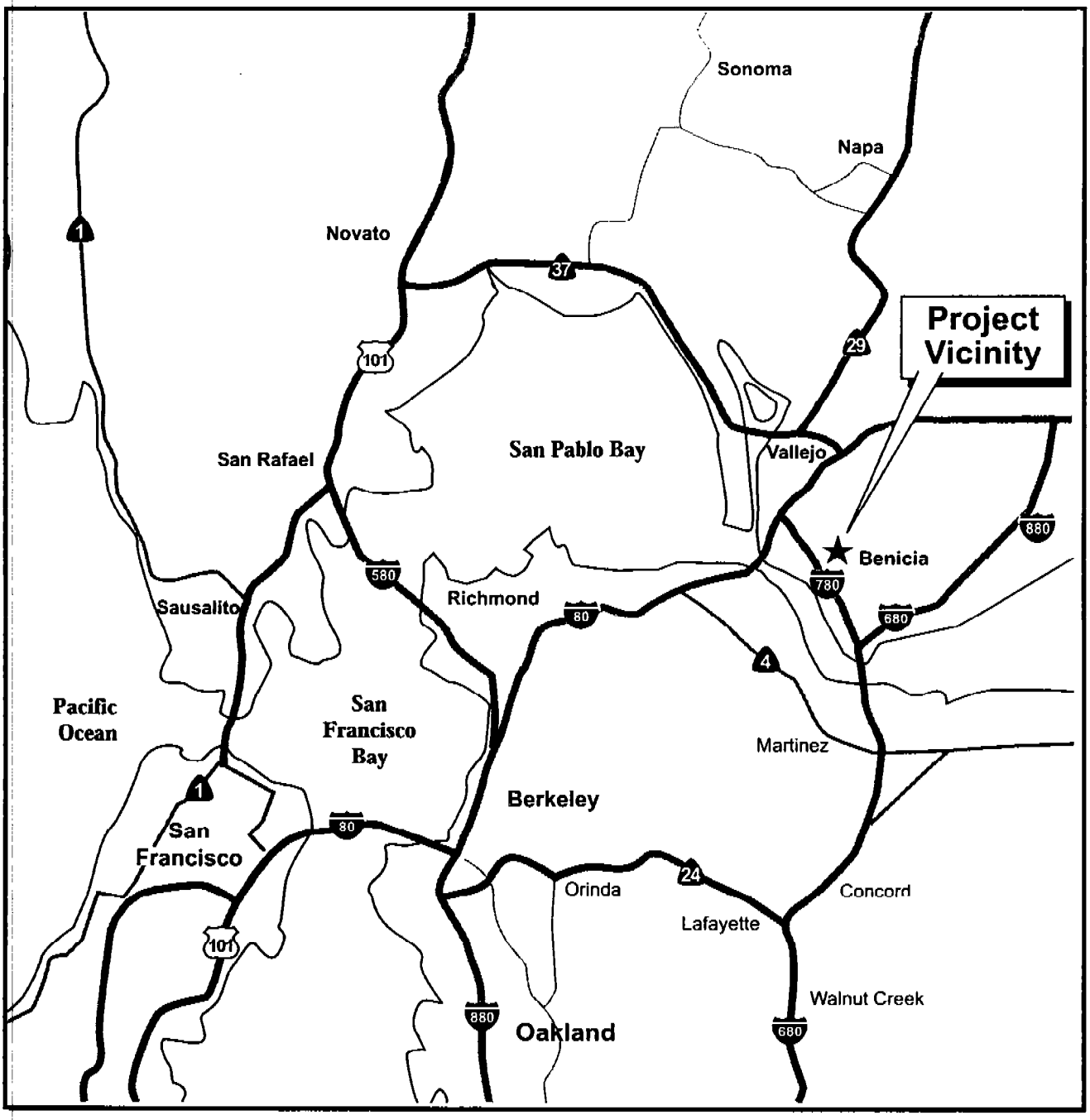

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Figure 1
PROJECT VICINITY

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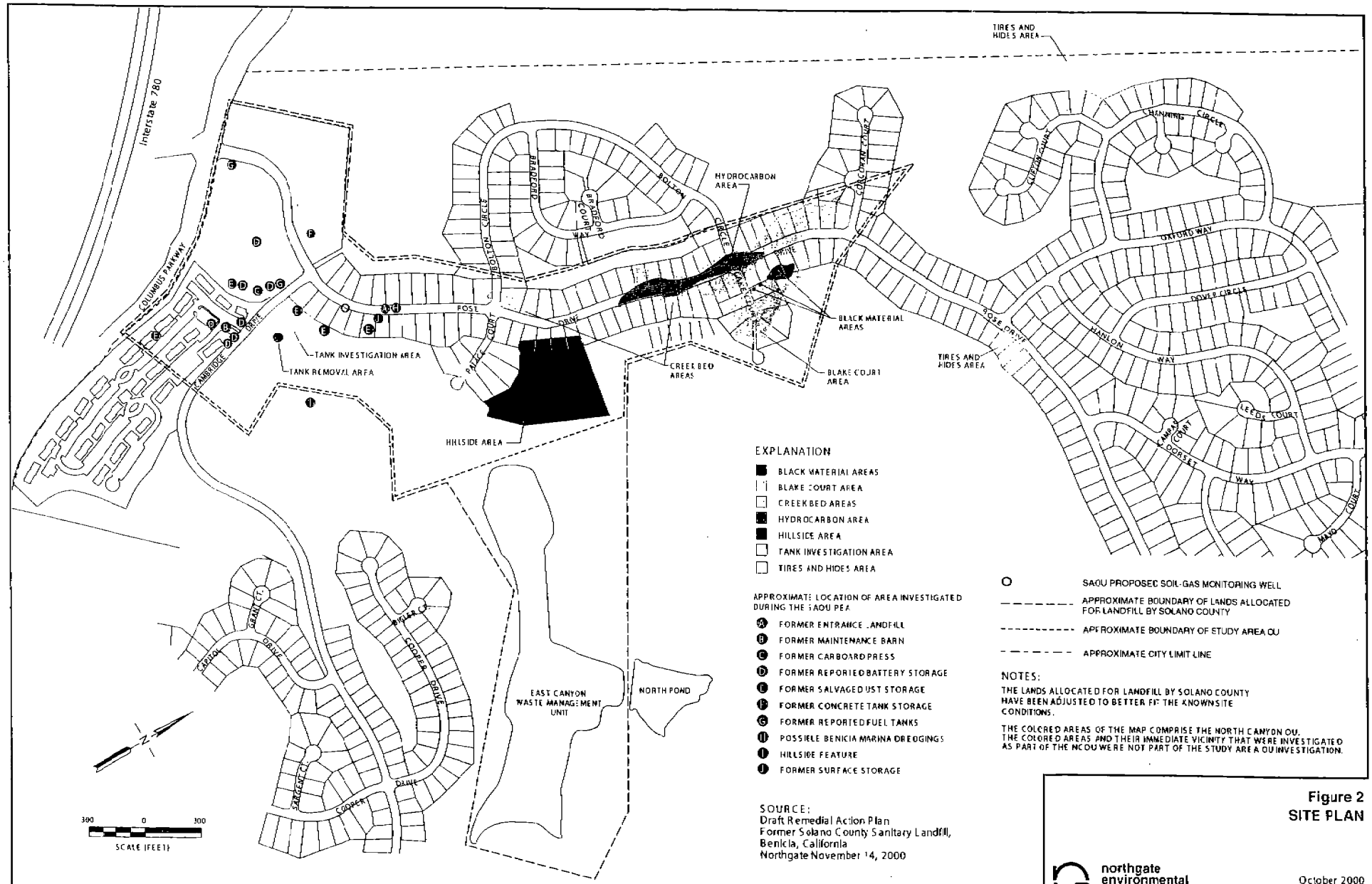

Figure 2
SITE PLAN

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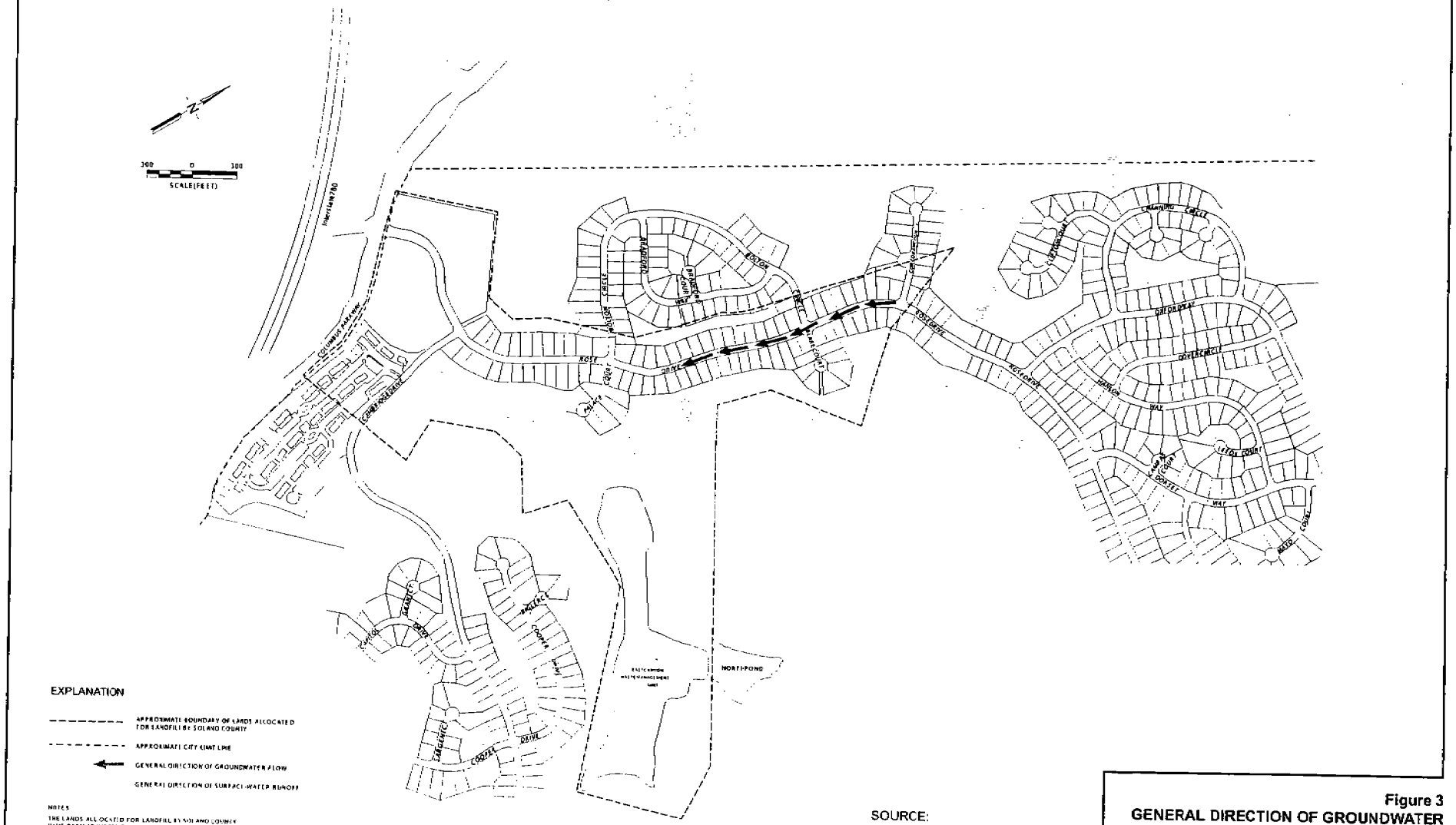
October 2000
Proj. No. 1056.01



SOURCE:
Feasibility Study and Public Health Evaluation of Remedial Alternatives, Levine-Fricke-Recon and ChemRisk, 1997

Figure 3
GENERAL DIRECTION OF GROUNDWATER FLOW, SURFACE WATER RUNOFF, AND PREVAILING WIND

northgate environmental management, inc.

December 2000
Proj. No. 1056.01

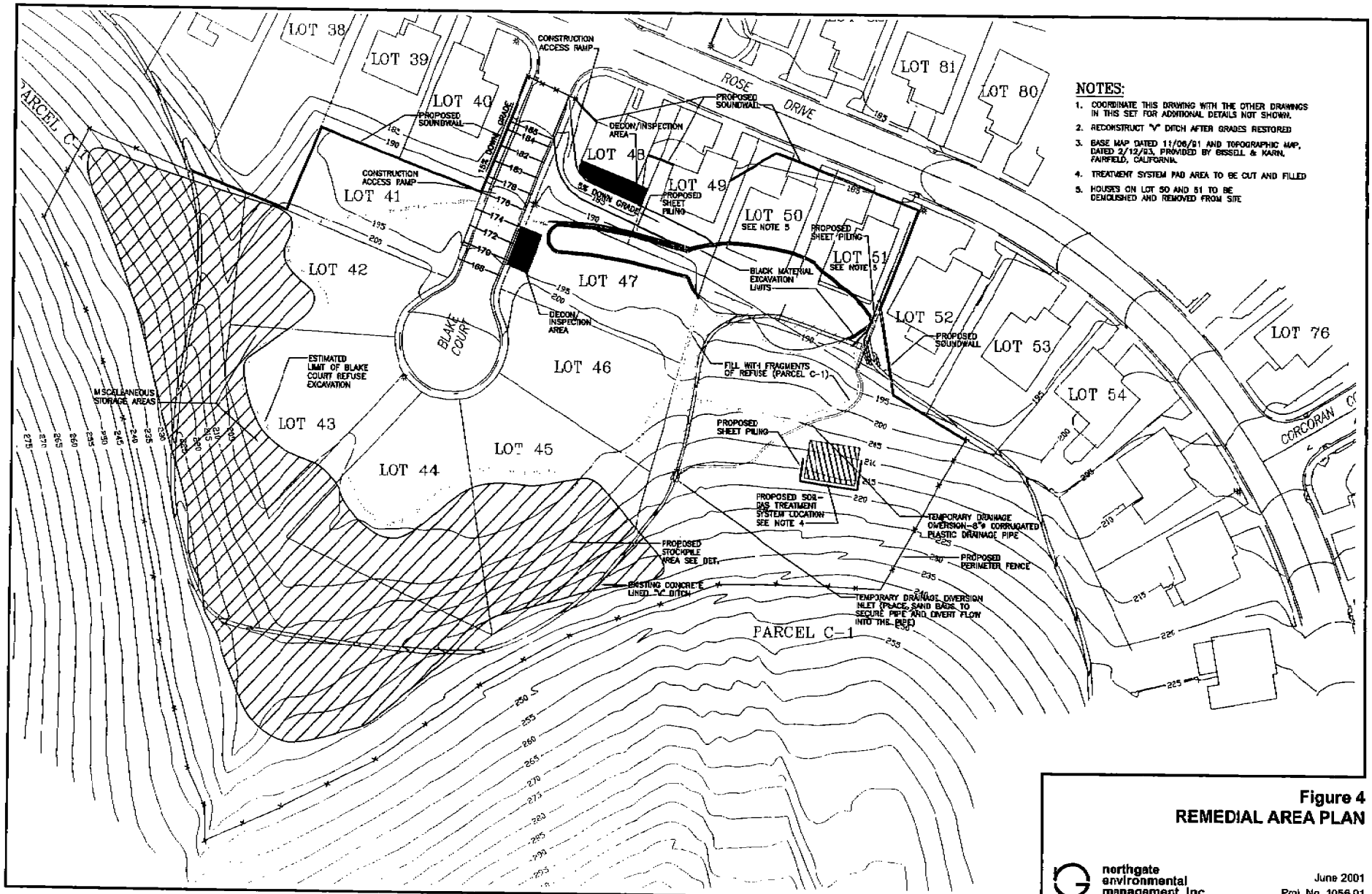


Figure 4
REMEDIAL AREA PLAN

northgate environmental management, Inc.

June 2001
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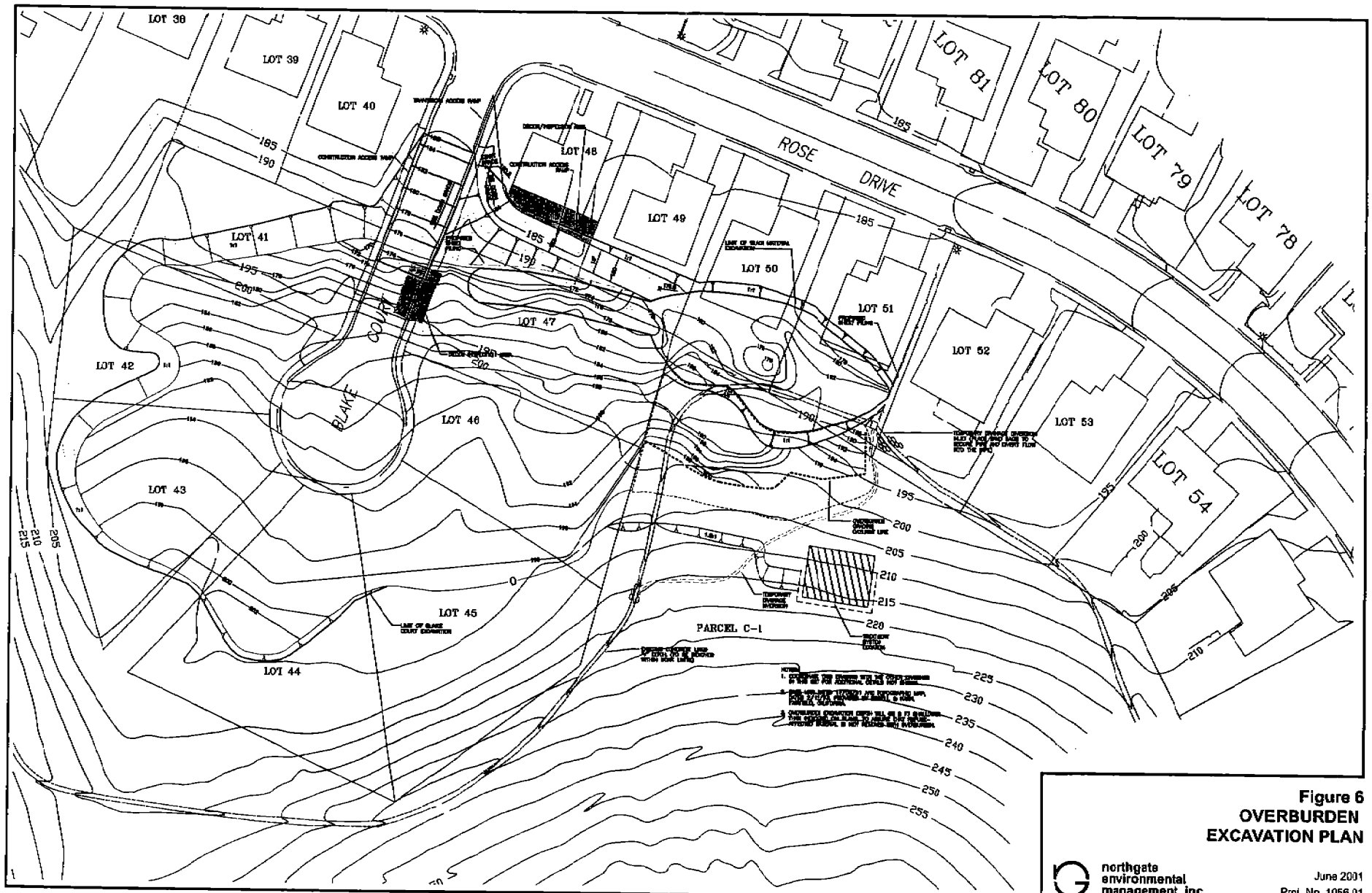


Figure 6
OVERBURDEN EXCAVATION PLAN

northgate environmental management, inc.

June 2001
Proj. No. 1056.01

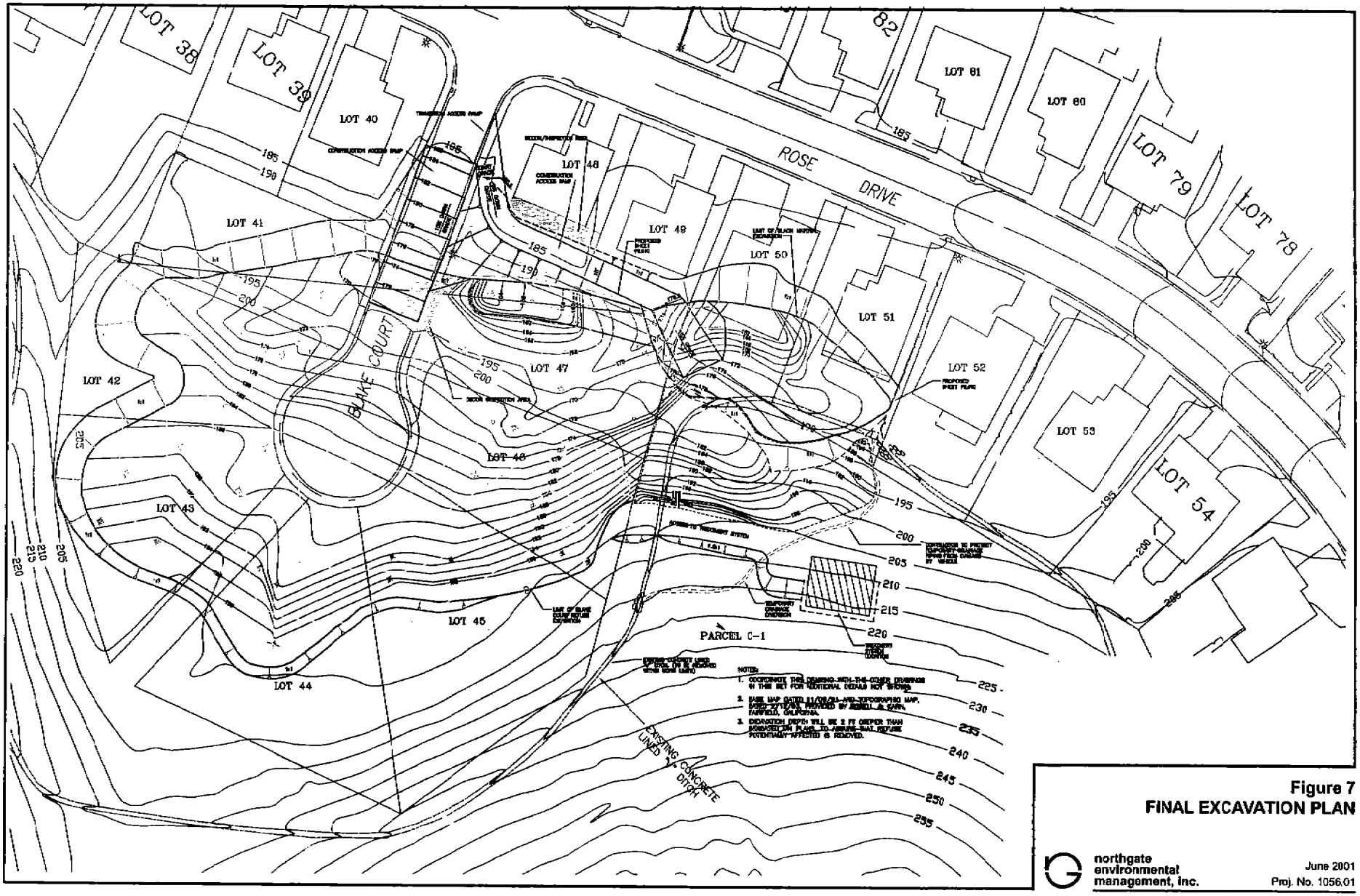


Figure 7
FINAL EXCAVATION PLAN

northgate environmental management, inc.

June 2001
Proj. No. 1056.01

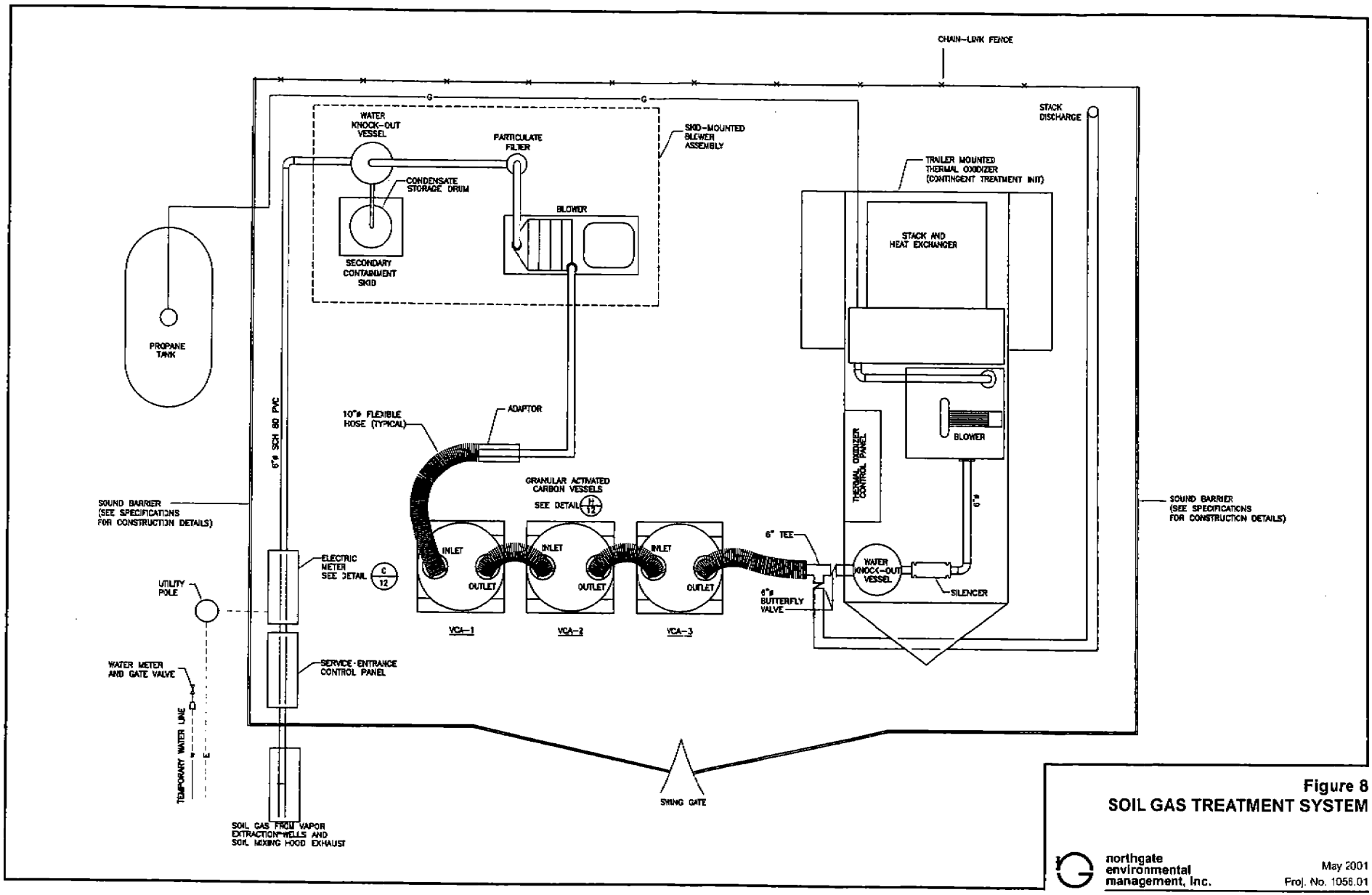
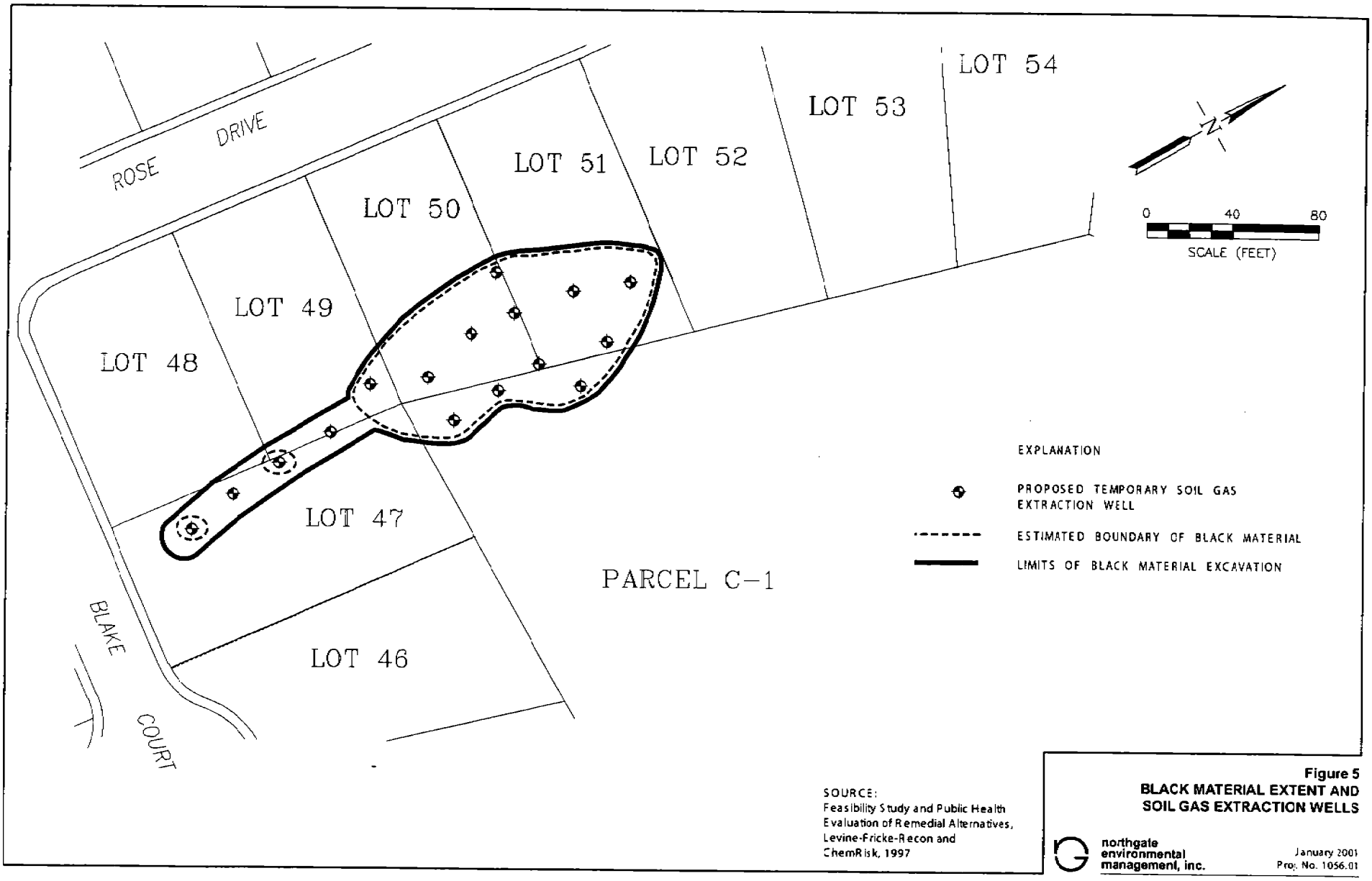


Figure 8
SOIL GAS TREATMENT SYSTEM

northgate environmental management, Inc.

May 2001
Proj. No. 1056.01



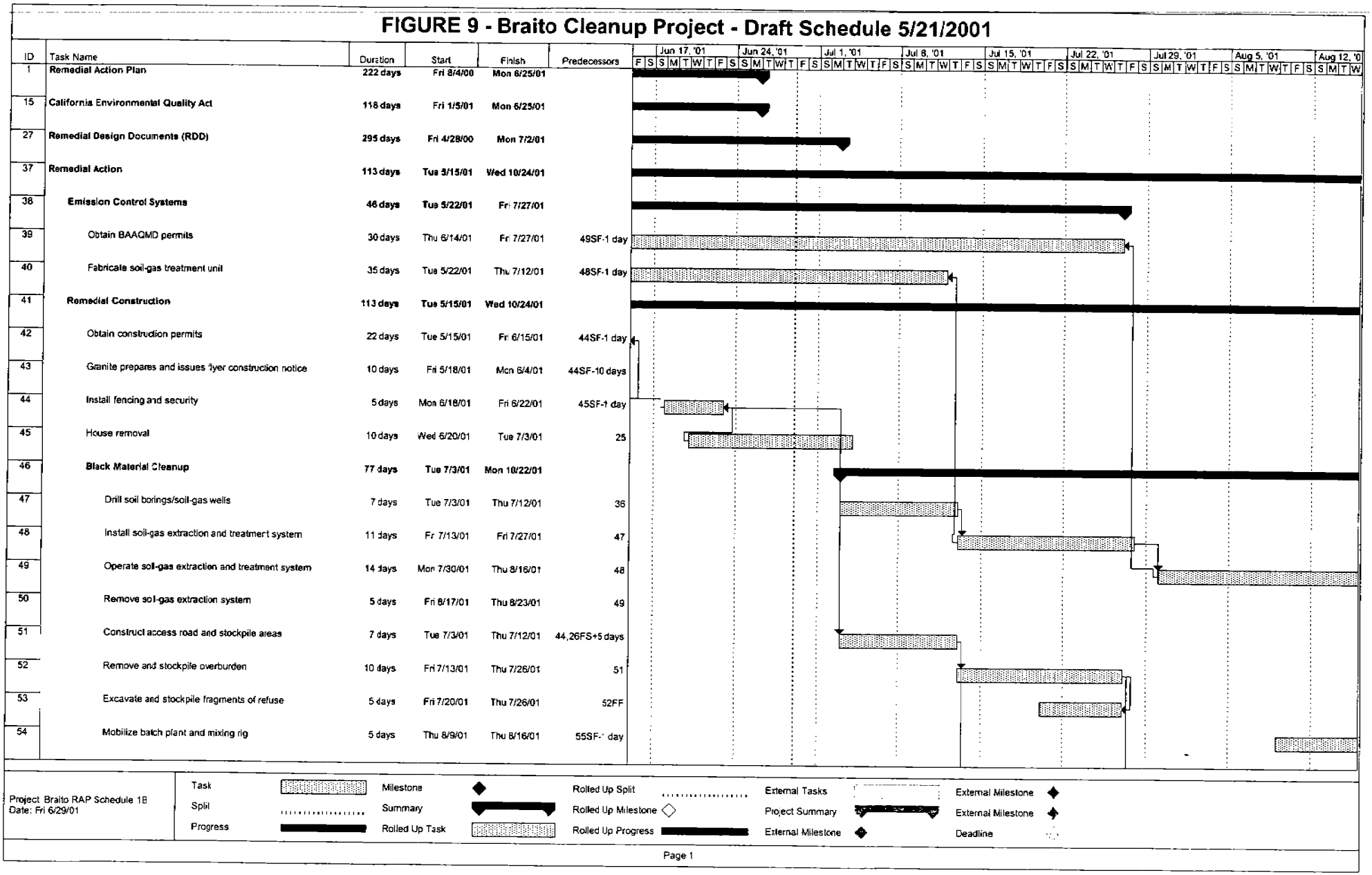
SOURCE:
Feasibility Study and Public Health Evaluation of Remedial Alternatives, Levine-Fricke-Recon and ChemRisk, 1997

Figure 5
BLACK MATERIAL EXTENT AND SOIL GAS EXTRACTION WELLS

northgate environmental management, inc.

January 2001
Proj. No. 1056.01

FIGURE 9 - Braito Cleanup Project - Draft Schedule 5/21/2001



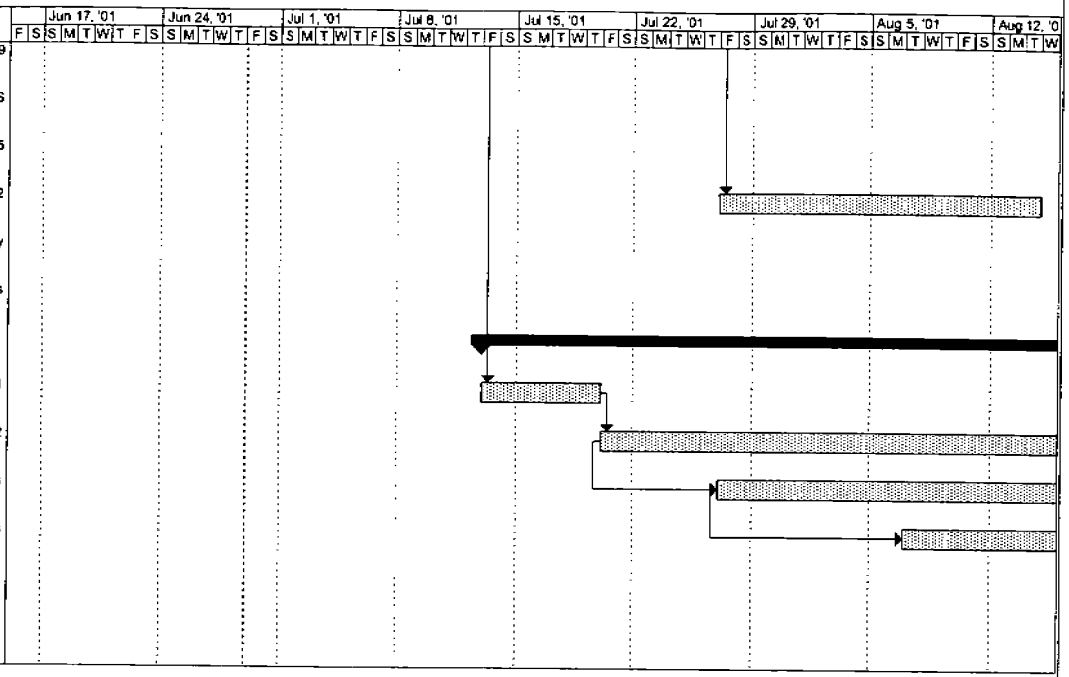
ID	Task Name	Duration	Start	Finish	Predecessors
1	**Remedial Action Plan**	**222 days**	**Fri 8/4/00**	**Mon 6/25/01**	
15	**California Environmental Quality Act**	**118 days**	**Fri 1/5/01**	**Mon 6/25/01**	
27	**Remedial Design Documents (RDD)**	**295 days**	**Fri 4/28/00**	**Mon 7/2/01**	
37	**Remedial Action**	**113 days**	**Tue 5/15/01**	**Wed 10/24/01**	
38	**Emission Control Systems**	**46 days**	**Tue 5/22/01**	**Fri 7/27/01**	
39	Obtain BAAQMD permits	30 days	Thu 6/14/01	Fri 7/27/01	49SF-1 day
40	Fabricate soil-gas treatment unit	35 days	Tue 5/22/01	Thu 7/12/01	48SF-1 day
41	**Remedial Construction**	**113 days**	**Tue 5/15/01**	**Wed 10/24/01**	
42	Obtain construction permits	22 days	Tue 5/15/01	Fri 6/15/01	44SF-1 day
43	Granite prepares and issues flyer construction notice	10 days	Fri 5/18/01	Mon 6/4/01	44SF-10 days
44	Install fencing and security	5 days	Mon 6/18/01	Fri 6/22/01	45SF-1 day
45	House removal	10 days	Wed 6/20/01	Tue 7/3/01	25
46	**Black Material Cleanup**	**77 days**	**Tue 7/3/01**	**Mon 10/22/01**	
47	Drill soil borings/soil-gas wells	7 days	Tue 7/3/01	Thu 7/12/01	36
48	Install soil-gas extraction and treatment system	11 days	Fri 7/13/01	Fri 7/27/01	47
49	Operate soil-gas extraction and treatment system	14 days	Mon 7/30/01	Thu 8/16/01	48
50	Remove soil-gas extraction system	5 days	Fri 8/17/01	Thu 8/23/01	49
51	Construct access road and stockpile areas	7 days	Tue 7/3/01	Thu 7/12/01	44,26FS+5 days
52	Remove and stockpile overburden	10 days	Fri 7/13/01	Thu 7/26/01	51
53	Excavate and stockpile fragments of refuse	5 days	Fri 7/20/01	Thu 7/26/01	52FF
54	Mobilize batch plant and mixing rig	5 days	Thu 8/9/01	Thu 8/16/01	55SF-1 day

Project: Braito RAP Schedule 1B
Date: Fri 6/29/01

Task | Milestone | Rolled Up Split | External Tasks | External Milestone
Split | Summary | Rolled Up Milestone | Project Summary | External Milestone
Progress | Rolled Up Task | Rolled Up Progress | External Milestone | Deadline

FIGURE 9 - Braito Cleanup Project - Draft Schedule 5/21/2001

ID	Task Name	Duration	Start	Finish	Predecessors
55	In situ soil treatment	15 days	Fri 8/17/01	Fri 9/7/01	49
56	Curing/testing of stabilized soil	24 days	Fri 8/17/01	Thu 9/20/01	55SS
57	Excavate stabilized soil	15 days	Mon 9/10/01	Fri 9/28/01	55
58	Load and remove stockpiled material	13 days	Fri 7/27/01	Tue 8/14/01	53,52
59	Confirmation sampling for Black Material Area	20 days	Tue 9/11/01	Tue 10/9/01	57SS+1 day
60	Backfill excavation	22 days	Thu 9/20/01	Mon 10/22/01	59SS+7 days
61	**Blake Court Landfill Cleanup**	**72 days**	**Fri 7/13/01**	**Wed 10/24/01**	
62	Excavate cap and backfill to Black Material excavation	5 days	Fri 7/13/01	Thu 7/19/01	51
63	Excavate and haul Blake Court refuse	55 days	Fri 7/20/01	Fri 10/5/01	62
64	Confirmation sampling for Blake Court	55 days	Fri 7/27/01	Mon 10/15/01	63SS+5 days
65	Haul soil and fill Blake Court excavation	55 days	Tue 8/7/01	Wed 10/24/01	64SS+7 days
66	**Implementation Report**	**90 days**	**Tue 10/16/01**	**Thu 2/28/02**	
74	**DTSC Certification**	**10 days**	**Fri 3/1/02**	**Thu 3/14/02**	



Project: Braito RAP Schedule 1B
Date: Fri 6/29/01

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary | External Milestone | External Milestone | External Milestone | Deadline

APPENDIX A

Monitoring Program for Former Solano County Sanitary Landfill

Appendix A

Monitoring Program for Former Solano County Sanitary Landfill

This appendix describes the soil gas, groundwater and subdrain monitoring activities that will be conducted at the Former Solano County Sanitary Landfill (the Site) in accordance with the approved Feasibility Study and Remedial Action Plan for the Site. The approved remedial alternative included the following components:

- Treatment and offsite disposal of Black Material (Alternative A-6)
- Excavation and offsite disposal of Blake Court Refuse and Fill with Fragments of Refuse from a portion of Parcel C-1 (Alternative B-5)
- Continued monitoring in vicinity of Creek Bed/Hydrocarbon Area (Alternative C-2)
- Continued monitoring in vicinity of Tank Area (Alternative D-3)

The following sections discuss the monitoring locations, sampling schedule, and analyses that will be performed.

SOIL-GAS SAMPLING PROGRAM

Feasibility Study Alternative C-2 specified monitoring for five years in the Creek Bed/Hydrocarbon Area. This monitoring program has been implemented for four years since the Feasibility Study was approved. Soil gas wells in this area will continue to be monitored for one additional year. The Creek Bed/Hydrocarbon soil-gas wells are listed on table A-1. In addition to the Creek Bed/Hydrocarbon wells, as discussed in Section 3, a soil-gas well will be installed and monitored in the SAOU. This well will be installed near Lot 4 at the location where methane was previously detected. All wells will be monitored for methane using a field monitoring instrument (such as the GasTech LandSurveyor). In addition, well V-2 will be monitored for hydrogen sulfide using a field monitoring instrument (such as the GasTech LandSurveyor) and soil gas samples will be collected and submitted to the laboratory for analysis of hydrogen cyanide using the National Institute for Occupational Safety and Health (NIOSH) Method 7904, or an equivalent method.

After the five-year period is over, the monitoring results will be assessed and the schedule may be adjusted or curtailed, after obtaining the appropriate regulatory approvals.

GROUND WATER AND SUBDRAIN MONITORING PROGRAM

Feasibility Study Alternatives C-2 and D-3 specified groundwater monitoring for five years in the Creek Bed/Hydrocarbon Area and Tank Area, respectively. This monitoring program has been implemented for four years since the Feasibility Study was approved. Ground water wells in the Creek Bed/Hydrocarbon and Tank Area will continue to be monitored in accordance with the existing program. These wells include all existing wells with the exception of wells in the Black Material and Blake Court Areas that will be abandoned in conjunction with remedial activities in these areas (G-2R, G-3, B2, B5-1, B5-2, G-1, G-1d, N7s, N7d, SD-1). After the five-year period is over, the monitoring results will be assessed and the schedule may be adjusted or curtailed, after obtaining the appropriate regulatory approvals.

In addition to the above groundwater monitoring program, the subdrain (RDUD) will be sampled for one additional year in accordance with the existing sampling program. In the event that chemicals are detected in water samples collected from the RDUD at levels of potential concern, the subdrain sampling program will be continued, and the ground water monitoring plan may be modified, as appropriate.

APPENDIX B

Hydro-seeding Specifications

Appendix B

Hydro-seed Specifications

- Seed shall be at least 95% pure, weed-free, and be certified to have a minimum viability of 85%.
- Seed mix composition shall be as specified in the table below, and shall be applied at a minimum rate of 40 pounds per acre.
- Fertilizer shall be 6-20-20 with 15% sulfur and applied at a rate of 400 pounds per acre. (Fertilizer shall be applied as a mix with seed and fiber in slurry).
- Hydro-seeding shall be performed no earlier than October 1 or later than October 31 of the current year.
- The area of application shall have a firm seedbed that has previously been roughened by scarifying it to a depth of 2 to 4-inches or "track walking" unless a roughened condition already exists. No implement shall be used that will create an excessive amount of downward movement of soil clods on sloping areas. The seeding area shall be cleared of all rocks 2-1/2' or greater in diameter, organic material and debris.
- Seed shall not remain in the slurry longer than thirty (30) minutes. The slurry shall be mixed for at least 5 minutes after the last addition to the agitator tank before application starts. The slurry shall be applied at a rate that is non-erosive and minimizes runoff.
- Hydro-seeded areas shall be inspected 30 days after the first rain (3/4" or more in 24-hour period). All areas not showing growth shall be re-seeded. The hydro-seeding shall be re-inspected as soon as possible after March 1 of the following year to determine the success of the seeding. Contractor shall re-seed all areas showing inadequate growth, as soon as possible.

Seed Type	Scientific Name	Percent By Weight
Meadow Barley	Hordeum brachyantherum	40%
California Bromegrass	Bromus carinatus	32%
Arroyo Lupine	Lupinus succulentus	12%
California Poppy	Eschscholzia california	8%
Tomcat Clover	Trifolium tridentratum	8%