

Conor Pacific

Alameda County

MAR 07 2003

Environmental Health

March 5, 2003

Project No. BNC104

Mr. Balaji Angle
Angle Enterprises
5131 Shattuck Avenue
Oakland, California 94609

Re: Workplan for Additional Site Characterization and Downgradient Investigation, B&C Gas Mini Mart, 2008 First Street, Livermore, California

Dear Mr. Angle:

Conor Pacific has prepared the following Workplan for the B&C Gas Mini Mart (B&C) at 2008 First Street, Livermore, California (Figure 1) to address the letter received from Ms. Donna Drogos of Alameda County Environmental Health (ACEH).¹ Based on the results of previous investigations conducted in 1999, and on subsequent quarterly groundwater monitoring results, ACEH prepared the referenced letter requesting additional characterization and remediation efforts.

Conor Pacific prepared a previous Workplan² that described the installation of additional permanent groundwater monitoring wells. Because of site access constraints at the Bank of America property, a revised Workplan³ was prepared that proposed one-time groundwater sampling to better define the downgradient extent of the plume. This work was not implemented due to ongoing issues regarding site access.

The purpose of the current scope of work is to address the ACEH's concern regarding the potential threat posed by the subject site to the groundwater supply wells located downgradient of the site. The scope of work requested by the ACEH is extensive. To best address the ACEH concerns, and to most efficiently complete the work from both a budget and schedule standpoint, we are proposing that the work be performed in a phased approach. In this initial phase, we are proposing to:

¹ Alameda County Environmental Health (ACEH). 2003. Fuel Leak Case No. R0278, Desert Petroleum/BP Oil, 2008 1st Street, Livermore, CA. Letter dated January 22, 2003 prepared by Donna Drogos.

² Conor Pacific, *Workplan Addendum for Additional Downgradient Investigation*, B&C Gas Mini Mart, 2008 First Street, Livermore, California. January 2, 2001.

³ Conor Pacific, *Revised Workplan Addendum for Additional Downgradient Investigation*, B&C Gas Mini Mart, 2008 First Street, Livermore, California. April 13, 2001.

- Better define the source area based on existing data and supplemental field work,
- Better characterize the geologic and hydrogeologic environment controlling the contaminant fate and transport,
- Improve the delineation of the downgradient, lateral and vertical extent of the plume,
- Estimate the mass flux of MTBE to water supply well CWS#8, and;
- Evaluate the potential for vertical migration of the plume to the water supply aquifer.

Depending upon the findings of this initial phase of work, additional follow-on efforts may be necessary to complete the ACEH's requested evaluations.

SCOPE OF WORK

We have identified nine work tasks for this proposed phase of work. These tasks include:

1. Preparation of this Workplan, pre-field access negotiations, scheduling, and permitting.
2. Compilation and analysis of all available data in the source area.
3. Evaluation of potential preferred horizontal and vertical pathways.
4. Compilation of regional geologic/hydrogeologic data and development of regional and site conceptual model.
5. Geophysical evaluation of site wells.
6. Installation of three multilevel wells downgradient and one multilevel well in the source zone.
7. Groundwater sampling and analysis.
8. Evaluation of plume mass flux and potential capture zones.
9. Data evaluation and reporting.

Each of the above tasks is described in more detail below.

Task 1 - Pre-Field Access Negotiations, Scheduling, and Permitting

The first task will be to begin negotiations for access for the downgradient borings. The downgradient borings proposed in this workplan would be located on the Granada Bowling Alley property (Figure 2). The source zone boring will be located approximately 20 feet south of MW-6 on the B&C Gas Mini Mart property. The location of this boring may be modified based on field inspections and access. The boring may also be relocated further west along the margin of South L Street. Boring locations, depths, and rationale are discussed in detail in Task 6 below.

After obtaining access permission from the Granada Bowling Alley, the borings will be permitted with Zone 7 of the Alameda County Water District. Underground utilities will be cleared for well installations by contacting the Underground Service Alert (USA) and contracting a private utility locator.

Task 2 – Source Area Data Compilation

A considerable amount of data is available from previous investigations of the source area in the immediate vicinity of the subject property.^{4,5, 6,7} The geologic and groundwater data have been evaluated and compiled in previous work to define the contaminant plume, however, it does not appear that data from soil sampling efforts at the site have been similarly compiled and evaluated. This task will compile all available data on a detailed map and cross sections of the site (and surrounding area) including the tank, piping, and dispenser locations. Contour plots of contaminant distribution will be developed in plan and cross section. In addition to better characterization of the source, the intent of this task is to refine the site conceptual model (geology and hydrogeology) for use in the field investigations to follow.

Task 3 – Evaluation of Preferred Pathways

An evaluation of potential horizontal and vertical preferred pathways will be performed. This will include an evaluation of utility lines, sewers, and storm drains. Available data from the City of Livermore will be compiled on a map of the affected area (source area and plume) and field checked. Available data regarding former pipelines associated with the bulk fuel terminal (Mills Springs Apartments) will also be investigated.

A detailed well survey will be also be performed for the affected area (source area, plume and potential receptor wells) and data compiled on a map of the area. Primary sources of data that will be utilized include the ACEH files, DWR records, and City of Livermore files. The record search will be supplemented by Sanborn maps and review of aerial photographs. All available historical aerial photo coverage will be reviewed at the library of a local vendor (Pacific Aerial Surveys).

Task 4 – Development of Regional and Site Conceptual Model

Available geologic data from pertinent published and unpublished sources will be compiled and evaluated to develop a working conceptual model in the affected subject area. There is

⁴ Remediation Service International. 1994. Soil and Groundwater Investigation Report for 2008 First Street, Livermore, California. July 22, 1994.

⁵ Remediation Service International. 1995. Soil and Groundwater Investigation Report and Fourth Quarterly Report of 1995 Groundwater Sampling and Monitoring for 2008 First Street, Livermore, California. March 1995.

⁶ Touchstone Developments. 1996 UST and Product Piping Removal Soil Sampling Report. B&C Gas Mini Mart, 2008 First Street, Livermore, California. August 22, 1996.

⁷ Western Geo-Engineers. 1994. Waste Oil UST and Hydraulic Hoist Removal. Over-excavation Sample Report. April 26, 1994.

considerable site specific data available from the work performed at the Livermore Arcade and Miller's Outpost Shopping Center. This task will focus on developing a regional and local scale stratigraphic model to better define contaminant pathways and the character, genesis and extent of potential aquiclude(s) that protect the drinking water resource. To the extent possible, structure contour maps and isopach maps of significant aquicludes will be prepared. The data developed in this task will be integrated with the SCM developed in Task 2.

Task 5 – Geophysical Evaluation and Sampling of Site Well MW-1

A geophysical contractor will be hired to perform an evaluation of on site well MW-1 and/or MW-2 (additional wells may be surveyed as time permits). A heat-pulse flow meter (or equivalent tool) will be utilized to evaluate potential vertical flow in the well (Note: It may not be possible to perform heat pulse flowmeter measurements of MW-1 due to the 2" diameter of the well). In addition, a gamma induction tool will be used to profile the borehole(s) to evaluate the presence of potential fine-grained units and to compare with the soil boring log.

Depth discrete samples will be obtained from well MW-1 to aid in the determination of possible downward vertical flow in the well. A discrete interval sampler (e.g., pressurized bailer) will be utilized to obtain a series of samples from the well at approximate 10 foot vertical intervals. Based on the results of the geophysical profiling, velocity measurements, depth discrete sampling, and new drilling information (Task 6) a recommendation will be prepared regarding destruction of MW-1 and other long screen wells on site. If the wells are not acting as vertical conduits, they will likely be utilized on a temporary basis for the required interim remediation effort.

As part of this task, we also propose to temporarily install transducers and data loggers in existing wells MW-12 and D-12 to evaluate potential hydraulic response in relation to pumping of supply well CWS#8.

Task 6 – Drilling and Installation of Multi-level Wells

Three multilevel wells are proposed downgradient to better define the downgradient, lateral and horizontal extent of the contaminant plume. Based on discussions with the ACEH and their consultant, and previous difficulty in obtaining access from the Bank of America, it is proposed that three borings be installed along the northern and western boundary of the Granada Bowling Alley property (Figure 2). The three new borings/wells, in conjunction with existing well pairs D-1/MW-11 and D-2/MW-12 will define a curvilinear transect approximately 550 feet wide downgradient of and across the estimated plume location.

The borings will be installed using sonic drilling methods so that continuous core samples can be obtained, and the CMT Multilevel System (Solinst) can be installed through the drive casing. Borings will be advanced to a depth of 120' to penetrate the aquitard defined in wells D-1 and D-2. The sonic drive casing will serve as temporary conductor casing for penetration of the aquitard that underlies the potentially impacted upper water-bearing zone. Soils will be

logged by a Conor Pacific staff scientist according to the Unified Soil Classification System (USCS) under the supervision of a California Registered Geologist.

CMT Multilevel wells will be installed in each boring with a minimum of five monitoring zones. Each well will have a monitoring port below the aquitard and within the aquitard to address the issue of vertical gradients, and to assess whether any contamination has migrated below the upper water-bearing zone. Three to five monitoring zones will be installed above the aquitard (depending upon the stratigraphy encountered) to define potential vertical stratification of the plume in the upper water-bearing zone.

A single boring and multilevel well will be installed at the B&C Gas Mini Mart property to better define the vertical extent of the source zone and to determine if contamination has migrated below the upper water bearing zone. The presence of the suspected regional aquitard and its geologic character will be specifically addressed. Soil samples will be retained at minimum 5-foot intervals for analysis of residual NAPL. Data will be evaluated in accordance with recommended guidance for evaluating the presence of residual NAPL (API Publication No. 4699). This data, in conjunction with that obtained from the CMT Multilevel well, should allow a reasonable evaluation of contaminant distribution with depth.

Task 7 – Groundwater Sampling and Analysis

Groundwater samples will be obtained from each of the multilevel wells installed in this investigation (assumed 4 wells and 6 ports per well for 24 total samples). The multilevel wells will be developed using a check valve tubing pump (e.g., Waterra pump) or bladder pump until field parameters are steady (pH, DO, temperature, and specific conductance) and deemed representative of formation water. All purge water will be contained and properly disposed of consistent with analytical results. All groundwater samples will be analyzed for total petroleum hydrocarbons as gasoline by modified EPA Method 8015M, and for BTEX, MTBE, TAME, ETBE, DIPE, TBA, EtOH, EDB and EDC by EPA Method 8260 by a state-certified laboratory. Sample preservation will be discussed with the laboratory and appropriate containers provided by the lab.

If possible, samples of free phase gasoline from wells (MS) MW-1 and MW-2 or MW-5 will be obtained and submitted for a fuel fingerprint analysis. It should be noted, however, that free product thickness has declined significantly over the past several years and it may not be possible to obtain a product sample. As part of this task, previously obtained chromatograms for free phase gasoline will be resubmitted for analysis by the lab. Specifically, the chromatograms from (MS)MW-01 and MW-2 will be reevaluated for the presence of MTBE.

Task 8 – Evaluation of Contaminant Mass Flux

An analysis of potential mass flux to potential receptor well CWS#8 will be performed. An estimate of mass flux from the source zone, and within the downgradient plume transect will be developed. The capture zone of well CWS#8 will be estimated using accepted practices and procedures. An estimate of the resulting potential MTBE concentration in well CWS#8

under pumping conditions will be calculated assuming the entire contaminant plume was captured by the supply well. The potential threat to the supply well will be evaluated on the basis of this worst-case scenario and the contaminant pathways (and aquitards) identified by the regional and site conceptual model.

Task 9 - Reporting of Field Work and Analytical Results

The data collected during this investigation will be evaluated and a report will be prepared presenting the results of the investigation. The report will include a description of the field methods, an evaluation of the subsurface conditions and analytical results, maps illustrating the plume conditions, boring logs, and copies of laboratory analytical reports. The regional geologic conditions and SCM will be described in detail and its influence on the contaminant fate and transport discussed. An evaluation of possible data gaps will be performed and recommendations for continued monitoring and/or additional characterization will be included in the report.

SCHEDULE AND COST ESTIMATE

We have made contact with Granada Bowl and intend to pursue and finalize an access agreement as soon as possible. We are prepared to begin project work immediately following approval from the State of California Underground Storage Tank Cleanup Fund. Scheduling and permitting of the well installation program is estimated to require approximately 4 weeks depending on the chosen subcontractors availability. Tasks 2 through 5 will be performed concurrently with the pre-field activities for the drilling program. Drilling and installation of the CMT Multi-level wells will start immediately following permitting and underground utility clearance, and is anticipated to take 8 to 10 days. Groundwater sampling will be performed within one week of the completion of the field program. Laboratory analyses will be performed on a standard turn-around time of two to three weeks. The report preparation is anticipated to be complete three to four weeks after receiving the analytical results. In total, we estimate that the investigation will require approximately twelve to fourteen weeks following authorization to proceed.

A detailed cost estimate spreadsheet is attached. Conor Pacific will not exceed the cost estimate without prior authorization. All charges will be provided on a time-and-expense basis in accordance with our terms and conditions.

If you are in agreement with the scope of work, estimated costs, and schedule outlined in this proposal, please sign and return the attached work authorization form. We look forward to helping you with this project. Please feel free to call Bill Fowler (408-286-5363) or Kris Johnson (650-386-3828) if you have any questions.

Sincerely,
Conor Pacific



William L. Fowler, C.E.G. 1401
Project Manager



Kris H. Johnson, C.E.G. 1763
Senior Engineering Geologist

Figures

Figure 1 - Site Location

Figure 2 - Site Vicinity and Proposed Well Locations

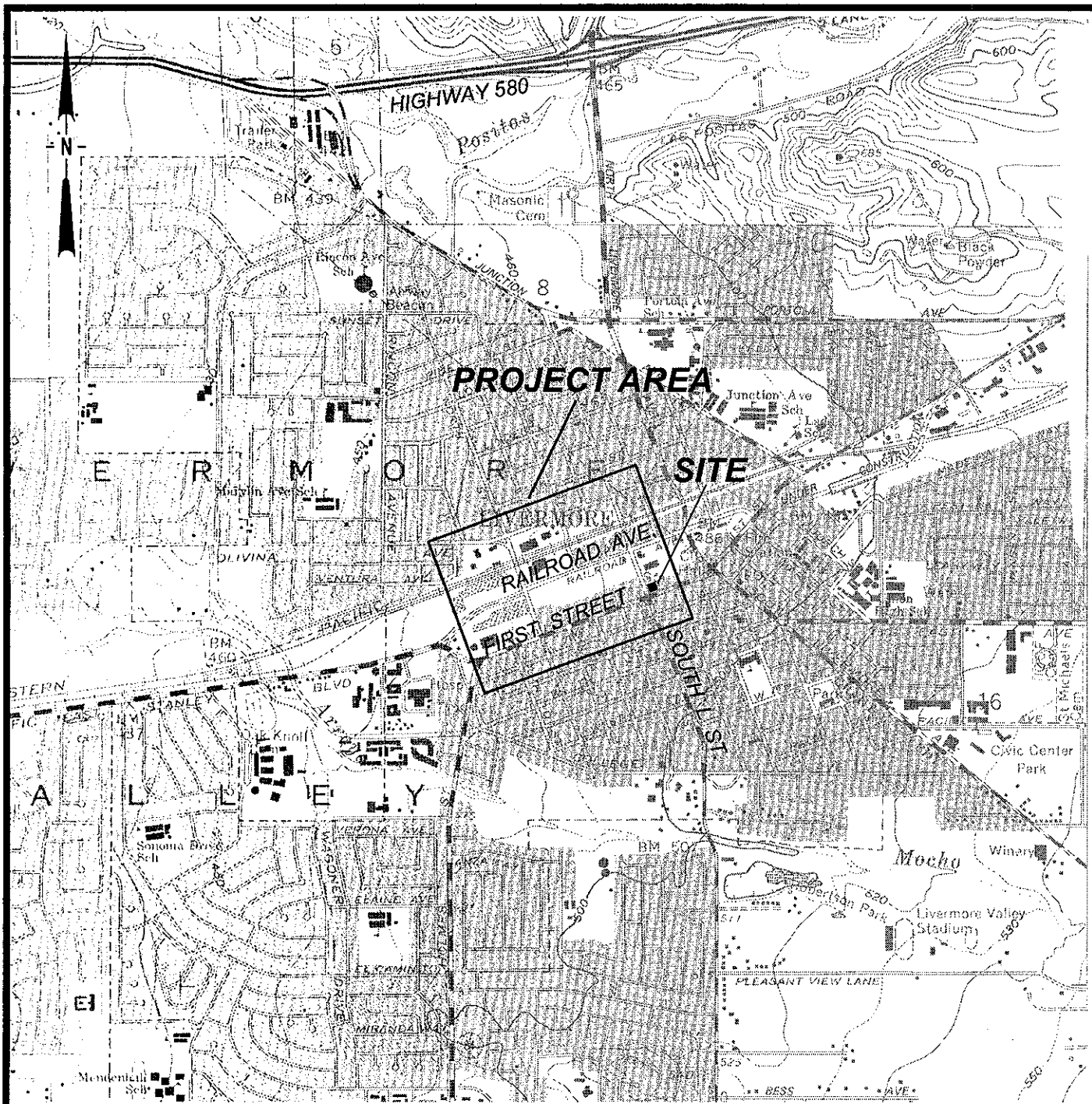
Appendices

Appendix A – Cost Estimate Spreadsheet

cc:



Ms. Colleen Winey, Alameda County Zone 7 (without Appendix A)





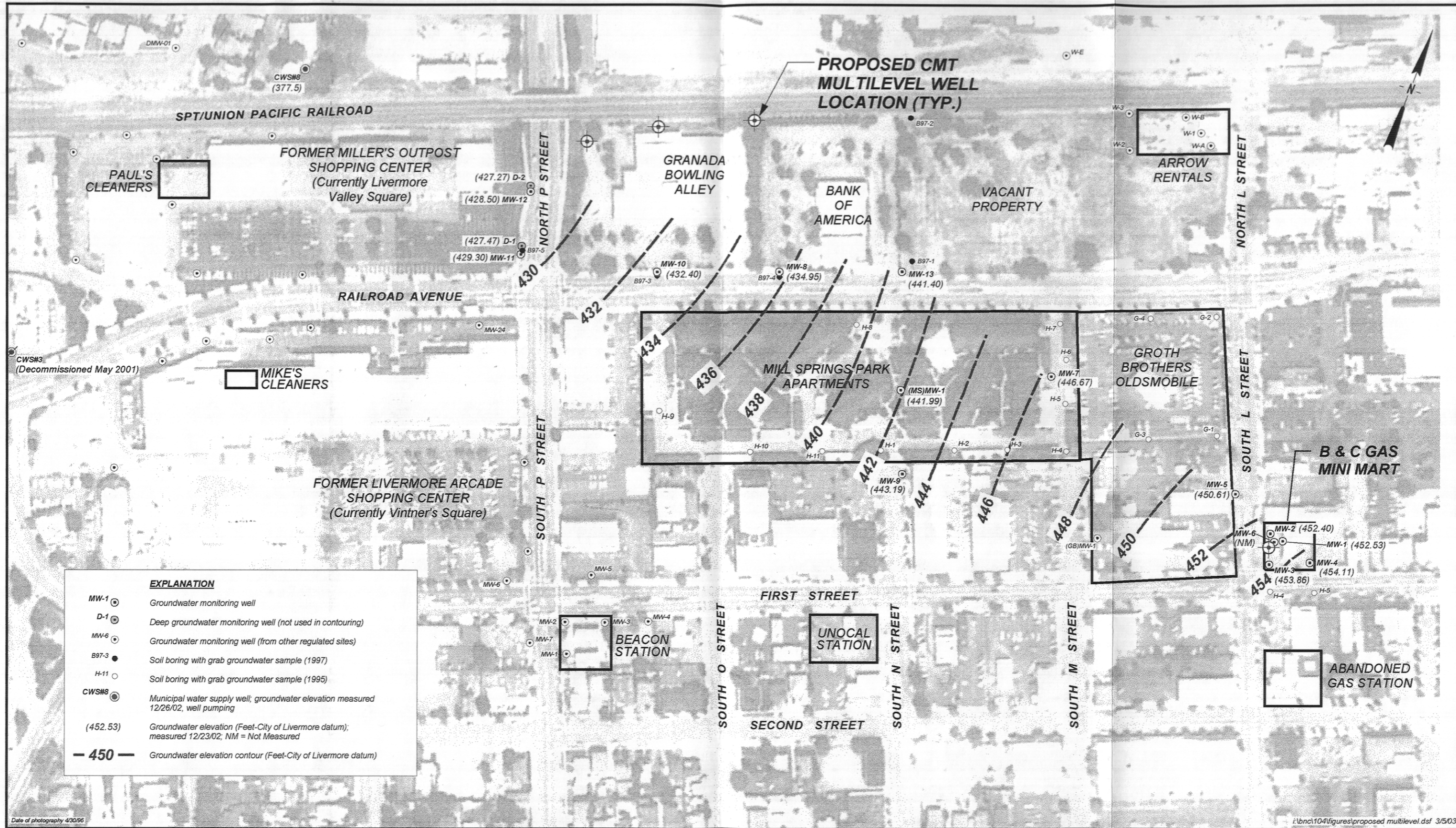
Base map: USGS 7.5' topography, Livermore, California (1961; photorevised 1980)

SCALE: 0 2,000 4,000 FEET



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 	ADDITIONAL SITE CHARACTERIZATION AND DOWNGRADIANT INVESTIGATION B & C GAS MINI MART LIVERMORE, CALIFORNIA	FIGURE 1
	SITE LOCATION MAP	PROJECT NO. BNC104



EXPLANATION	
MW-1	Groundwater monitoring well
D-1	Deep groundwater monitoring well (not used in contouring)
MW-6	Groundwater monitoring well (from other regulated sites)
B97-3	Soil boring with grab groundwater sample (1997)
H-11	Soil boring with grab groundwater sample (1995)
CWS#8	Municipal water supply well; groundwater elevation measured 12/26/02, well pumping
(452.53)	Groundwater elevation (Feet-City of Livermore datum); measured 12/23/02; NM = Not Measured
- 450 -	Groundwater elevation contour (Feet-City of Livermore datum)

Conor Pacific

SCALE: 0 200 400 FEET

(APPROXIMATE)

ADDITIONAL SITE CHARACTERIZATION AND DOWNGRAIDENT INVESTIGATION
 B & C GAS MINI MART
 LIVERMORE, CALIFORNIA

PROPOSED WELL LOCATIONS

FIGURE
2
 PROJECT NO.
 BNC104

Date of photography 4/30/96 i:\bnc104\figures\proposed multilevel.dsf 3/5/03