

DRAFT
2003
OPERATIONS, MAINTENANCE &
MONITORING ANNUAL REPORT

MCCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA



Prepared For:

McColl Site Group

Prepared By:

C2 REM

February 6, 2004

DRAFT
TABLE OF CONTENTS
2003 OM&M REPORT
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

1.0 INTRODUCTION

2.0 SITE HISTORY

3.0 OM&M MODIFICATIONS AND REPORTING REQUIREMENTS

3.1 MODIFICATION ONE AND FOUR

3.2 MODIFICATON TWO

3.3 MODIFICATION THREE

3.4 MODIFICATIN FIVE

3.5 SUMMARY

4.0 INSPECTIONS

5.0 MONUMENT SURVEY EVENT

6.0 CAP GAS COLLECTION AND TREATMENT SYSTEM OPERATION

6.1 OBJECTIVES

6.2 BI-MONTHLY CAP GAS MONITORING

6.3 CARBON BED CHANGE-OUT PROTOCOL

6.4 GAS COLLECTION PRESSURE PROBES

6.5 GCTS MECHANICAL PROCESS MONITORING

6.6 ANNUAL CONFIRMATION SAMPLING EVENT

7.0 GROUNDWATER MONITORING

7.1 OBJECTIVES

7.2 2003 GROUNDWATER MONITORING EVENTS

7.3 LOW FLOW GROUNDWATER SAMPLING TECHNIQUE

8.0 ROUTINE MAINTENANCE

8.1 OBJECTIVES

8.2 COVER SYSTEM

8.3 CAP GAS COLLECTION AND TREATMENT SYSTEM

8.4 SURFACE AND SUBSURFACE DRAINAGE SYSTEMS

8.5 ACCESS ROAD

8.6 SECURITY FENCE

9.0 REPAIRS

9.1 OBJECTIVES

9.2 REQUIRED REPAIRS

9.2.1 GCTS BLOWER MOTER AND ELECTRICAL COMPONENT
REPAIR

9.2.2 SURFACE DRAINAGE SYSTEM REPAIRS

10.0 CONCLUSIONS AND RECOMMENDATIONS

**DRAFT
TABLE OF CONTENTS
2003 OM&M REPORT
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA**

11.0 REFERENCES

TABLES/FIGURES

ACRONYMS AND ABBREVIATIONS

APPENDICES

- A. PHASED TECHNICAL MEMORANDUM, PROPOSED OM&M MODIFICATIONS, DECEMBER 17, 2002
- B. TECHNICAL MEMORANDUM, OPERATIONS, MAINTENANCE, AND MONITORING (OM&M) MODIFICATION #2, PROPOSED CARBON BED CHANGE-OUT PROTOCOL, OCTOBER 14, 2003
- C. INSPECTION FORMS
- D. GCTS BI-MONTHLY MONITORING FORMS
- E. 2003 GCTS USAGE REPORT
- F. 2003 GROUNDWATER MONITORING LOGS AND LABORATORY REPORTS
- G. EPA-GROUNDWATER ISSUE, LOW FLOW (MINIMAL DRAWDOWN) GROUNDWATER SAMPLING PROCEDURES
- H. COMPLETED MAINTENANCE REPAIRS FORMS

**DRAFT
TABLES AND FIGURES
2003 OM&M REPORT
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA**

<u>TABLE NO.</u>	<u>TABLES</u>
TABLE 1.0	REVISED GROUNDWATER MONITORING WELL SAMPLING EVENT SCOPE AND FREQUENCY
TABLE 2.0	COVER SYSTEM INSPECTION SUMMARY
TABLE 3.0	REINFORCEMENT EARTH SLOPE INSPECTION SUMMARY
TABLE 4.0	GCTS INSPECTION SUMMARY
TABLE 5.0	SURFACE WATER DRAINAGE INSPECTION SUMMARY
TABLE 6.0	SUBSURFACE DRAINAGE INSPECTION SUMMARY
TABLE 7.0	SECURITY FENCE INSPECTION SUMMARY
TABLE 8.0	ACCESS ROAD INSPECTION SUMMARY
TABLE 9.0	PID READINGS AND EFFICIENCY OF CARBON VESSELS JANUARY 2003 THROUGH DECEMBER 2003
TABLE 10.0	LOCATION OF GAS PRESSURE PROBES AND GAS SAMPLING PROBES
TABLE 11.0	GAS SAMPLE PROBE AND GAS PRESSURE PROBE MONITORING RESULTS
TABLE 12.0	2003 GROUNDWATER MONITORING RESULTS - VOCS
TABLE 13.0	2003 GROUNDWATER MONITORING RESULTS - METALS
TABLE 14.0	2003 GROUNDWATER ELEVATION RESULTS
TABLE 15.0	SUMMARY OF OM&M EVENTS

**DRAFT
TABLES AND FIGURES
2003 OM&M REPORT
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA**

<u>FIGURE NO.</u>	<u>FIGURES</u>
FIGURE 1.0	SITE LOCATION MAP
FIGURE 2.0	SUMP LOCATION MAP
FIGURE 3.0	SCHEMATIC GEOLOGIC CROSS SECTION C-C”
FIGURE 4.0	CARBON BED CHANGE-OUT PROTOCOL
FIGURE 5.0	C2 REM V-DITCH REPAIR
FIGURE 6.0	C2 REM V-DITCH REPAIR
FIGURE 7.0	GPP AND GSP MONITORING RESULTS
FIGURE 8.0	GROUNDWATER ELEVATION MAP
FIGURE 9.0	BTEX LABORATORY RESULTS – WELLS P-21, P-10XD, P-10D, P-9D
FIGURE 10.0	BTEX LABORATORY RESULTS – WELLS P-5I, P-5D, P-5L, W-9C, W-10B
FIGURE 11.0	THT LABORATORY RESULTS – WELLS P-2I, P-10XD, P-10D, P-10L, P-9D
FIGURE 12.0	THT LABORATORY RESULTS – WELLS P-5I, P-5D, P-5L, W-9C, W-10B
FIGURE 13.0	METALS LABORATORY RESULTS – WELLS P-2I, P-10XD, P-10D, P-10L, P-9D
FIGURE 14.0	METALS LABORATORY RESULTS - WELLS P-5I, P-5D, P-5L, W-9C, W-10B
FIGURE 15.0	GCTS MODIFICATION

C2 REM STANDARD ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
COCs	Constituents of Concern
COIs	Constituents of Interest
GCTS	Gas Collection and Treatment System
GPPs	Gas Pressure Probes
GSPs	Gas Sampling Probes
LCCC	Los Coyotes Country Club
µg/L	micrograms per liter
MCL	Maximum Contaminate Level
MSG	McColl Site Group
ND	Not Detected
O&M	operation and maintenance
OM&M	operations, maintenance & monitoring
PID	photo ionization detector
PLC	programmable logic controller
RESs	Reinforced Earthen Slopes
ROD	Record of Decision
THTs	Tetrahydrothiophenes
TM	Technical Memorandum
UAO	Unilateral Administrative Order
USACOE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

1.0 INTRODUCTION

This Operations, Maintenance and Monitoring (OM&M) Annual Report (Report) has been prepared on behalf of the McColl Site Group (MSG) to summarize the OM&M activities conducted at the McColl Superfund Site (Site), pursuant to requirements outlined in the *Unilateral Administrative Order (UAO) 96-10 for Remedial Design and Remedial Actions, McColl Superfund Site, Fullerton, California, United States Environmental Protection Agency (USEPA), July 1996* (USEPA, 1996a); *Record of Decision (ROD) for the Source Operable Unit, Docket No. R09-93/095, McColl Superfund Site, Fullerton, California, USEPA, June 1993* (USEPA, 1993); *Record of Decision for the Groundwater Operable Unit, Docket No. R09-96/154, McColl Superfund Site, Fullerton, California, USEPA, May 9, 1996* (USEPA, 1996b); and the *O&M Plan McColl Superfund Site, Fullerton, California, Parsons Engineering Science, October 15, 1997* (O&M Plan). Specifically, this Report provides information and analysis of the Site OM&M activities conducted during the sixth year of operation (January 2003-December 2003). This Report includes discussions on: 1) modifications to existing OM&M activities; 2) inspections (pursuant to both semi-annual and annual requirements, and post-rain events) of the reinforced earthen slopes (RESs), the cover system, settlement, the Gas Collection and Treatment System (GCTS), surface and subsurface drainage, and general physical site characteristics (i.e., vegetative cover and composition); 3) assessments of the operation of the GCTS; 4) activities conducted during twelfth, thirteenth, and fourteenth groundwater monitoring events; 5) summaries of maintenance and repairs; and 6) development and recommendations for long-term OM&M activities at the Site.

The remainder of this Report is outlined in the following sections:

- 2.0 Site History
- 3.0 OM&M Modifications and Reporting Requirements
- 4.0 Inspections
- 5.0 Monument Survey Event
- 6.0 Cap Gas Collection and Treatment System Operation
- 7.0 Groundwater Monitoring

- 8.0 Routine Maintenance
- 9.0 Repairs
- 10.0 Conclusions and Recommendations
- 11.0 References

2.0 SITE HISTORY

The Site is located approximately 25 miles southeast of Los Angeles in Fullerton, Orange County, California (see Figure 1.0). The Site is approximately 22 acres in size and is comprised of the 7-acre Ramparts parcel and the 3.5-acre Los Coyotes parcel. Housing developments border the Site to the east and south. The Site is overlain by portions of the Los Coyotes Country Club (LCCC) golf course. The Ralph B. Clark Regional Park is located to the west of the site. Additionally, an oil field located north of Rosecrans Avenue is being developed for residential use and constitutes the northern boundary of the Site. The Site is located in an earthquake zone 4, denoting the highest level of earthquake activity.

The Site was created as a disposal area for acid sludge wastes (primarily from the production of high-octane aviation fuel during World War II) and for oil-based drilling muds commencing approximately ten years later. In 1942, a total of 12 pits (known as “sumps”) were constructed, consisting of six sumps on each parcel (the Ramparts area: sumps R-1 through R-6; and the Los Coyotes area: sumps L-1 through L-6) (see Figure 2.0). The sumps were unlined pits extending to depths ranging from 23 to 40 feet below ground surface (bgs). Between 1942 and 1946 these sumps were filled with approximately 72,600 cubic yards of sludge. Later, from 1951 to 1962, drilling muds from oil production activities were deposited on-site, mainly in the lower Rampart sumps (R-1, R-2 and R-4). The majority of the waste has been characterized as a hard, black char with low pH. The Constituents of Concern (COCs) include Volatile Organic Compounds (VOCs) including benzene, toluene, ethylbenzene, and xylenes (BTEX), as well as inorganics including metals, and sulfur containing compounds, including tetrahydrothiophenes (THTs) (USEPA, 1993).

In 1957, the LCCC was constructed over the Los Coyotes area pits and the two northern Ramparts area pits. In the 1960s, developers began building homes in this area of Orange County. In the mid-1970s, homes were built adjacent to the eastern and southern borders of the Ramparts and Los Coyotes areas. In 1978, Orange County received the first complaint of odors from area residents, and tar-like materials were reportedly observed seeping to the surface prior to Site remediation efforts.

After several years of investigation and remedial option analysis, the USEPA issued a ROD for the Site source area in 1993 (USEPA, 1993) and a second ROD for groundwater in 1996 (USEPA, 1996b).

The designed and constructed remedy for the Site source area began with the sumps being covered with 1 to 5 feet of overburden soil. Next, an engineered soil and geosynthetic cover (with an active vapor extraction conveyance and treatment system) and vertical slurry walls were installed over and around each sump area (i.e., Ramparts and Los Coyotes). LCCC converted a portion of terrain overlying the sump areas into three golf holes on their course; these holes were opened for play in July 1998. The remainder of the Site has surface vegetation. There is aboveground piping for irrigation on some portions of the Site, and there are graded areas, drainage ditches and other features to control surface water run-on/run-off.

During the evaluation of groundwater conditions, four shallow groundwater zones/units have been identified in the upper sediments underlying the Site. Zones A, B and C are located within the Upper Pleistocene La Habra Formation; the D zone is located within the Lower Pleistocene Coyote Hills Formation (see Figure 3.0). The zones are separated by clay layers (aquitards/aquicludes), which act as barriers to the vertical flow and appear to be continuous across the site. Water in the A and B zones underlying the Site exists as perched groundwater. Water in Zone C is perched beneath much of the Site, but is not isolated from the underlying groundwater zones beneath the southern portion of the Site. The D zone is situated at depths ranging from approximately 150 to 250 feet bgs at the Site. Water in this zone exists in a confined condition, *Final Remedial Investigation*

Report Groundwater Operable Unit, McColl Site, Fullerton, California, Environ Corporation, December 1995 (Environ, 1995).

Two municipal production wells were identified within 7,000 feet of the Site during the Remedial Investigation (RI). These are the City of Fullerton's well Coyote 12A, and the City of Buena Park's Smith-Murphy well (Environ, 1995). The Coyote 12A well is located approximately 3,000 feet cross-gradient (southeast) of the Site. The Coyote 12A well obtains approximately 69% of its flow from the San Pedro "main" aquifer, 30% from the upper San Pedro formation, and approximately 1% from the Coyote Hills Formation. The Zone D flow unit may have some equivalency to the shallowest screened interval of the Coyote 12A well. The Smith-Murphy well is located approximately 7,000 feet southwest of the Site, and obtains its flow from geothermal waters upwelling from fault systems totally unrelated to the groundwater at the McColl Site (Environ, 1995).

As part of the remedy, a series of Site and vicinity groundwater monitoring wells were installed and screened within the A, B, and C zones, and are reported to produce small quantities of extractable water. The D zone water bearing unit underlying the Site is a potentially productive unit, though there is limited recharge available to this zone, due to the fact that the groundwater zones underlying the Site are located along the boundary of the regional groundwater basin (Environ, 1995). Thus far, the Site remedial action activities have been completed and long-term OM&M activities commenced in 1998.

3.0 OM&M MODIFICATIONS AND REPORTING REQUIREMENTS

On December 17, 2002, C2 REM submitted *Technical Memorandum (TM), Proposed OM&M Modifications, McColl Superfund Site, Fullerton, California, C2 REM, December 17, 2002* (C2 REM, 2002) to USEPA presenting a series of proposed modifications to the OM&M activities currently being conducted at the Site (see Appendix A). Specifically, C2 REM identified and recommended the following modifications to OM&M requirements and/or procedures:

- **MODIFICATION ONE** - Reduce groundwater monitoring frequency and scope by eliminating laboratory analysis from the upgradient wells while maintaining these wells to determine groundwater elevation.
- **MODIFICATION TWO** - Generate a quantitative procedure/protocol for GCTS carbon replacement based on health risk and aesthetic issues assessments of maximum effluent concentrations for COCs.
- **MODIFICATION THREE** – Evaluate the current ROD recommended 3.6-µg/L THT offsite institutional control trigger level, using health risk analysis as the defining factor.
- **MODIFICATION FOUR** - Following preparation of the standardized carbon replacement protocol (Modification Two), re-evaluate the Site visit frequency coordinating it with the carbon replacement as appropriate.

In addition, subsequent to the twelfth groundwater monitoring event (February 27 and March 6, 2003), C2 REM proposed and received initial approval from the USEPA to test an alternative groundwater sampling technique (a final TM for continued use of this technique will be submitted in 2004). Specifically, C2 REM recommended the following modification:

- **MODIFICATION FIVE** – Assess the low flow/minimal drawdown sampling technique to replace the traditional high flow/fixed volume technique during future groundwater monitoring events.

3.1 MODIFICATION ONE AND FOUR

Members of the MSG, United States Army Corps of Engineers (USACOE), USEPA, and C2 REM met on January 31, 2003 to discuss the five proposed modifications and to assess any impacts the modifications may have on Site operations. It was agreed during this meeting that future groundwater monitoring activities be conducted in accordance

with the following protocol: all existing operational groundwater wells shall be “sounded” for groundwater depth on a semi-annual basis, groundwater monitoring wells, P-2I, P-10D, P-10L, and P-10XD shall be both sounded and sampled for chemical analysis on an annual basis, and wells P-5I, P-5L, P-9D, P-5D, W-9B, W-9C, and W-10B sounded and sampled for chemical analysis on a bi-annual basis (as proposed in Modification One) (see Table 1.0).

Additionally, USEPA and USACOE at the January 31, 2003 meeting agreed to the rescheduling of routine Site visits from once per week to twice per month (as proposed in Modification Four). Further, it was agreed that future reporting requirements would be limited to bi-monthly email summaries of routine Site visits (sent to USACOE liaisons), and to Annual Reports.

3.2 MODIFICATION TWO

On October 14, 2003, C2 REM submitted the TM entitled *Operations, Maintenance, and Monitoring (OM&M) Modification #2, Proposed Carbon Bed Change-Out Protocol, McColl Superfund Site, Fullerton, California, C2 REM, October 14, 2003* (C2 REM, 2003a) to the USEPA. C2 REM received approval (October 29, 2003) of the proposed modifications to the existing carbon bed change-out protocol as outlined in Modification Two (see Appendix B). Specifically, the proposed modifications to OM&M activities and/or procedures with regard to the carbon bed change-out protocol were:

- 1) Reduce the carbon volume per vessel based on adsorption calculations (including an engineered factor of safety of approximately 1.2);
- 2) Replace sodium hydroxide (NaOH) impregnated carbon with bituminous carbon;
- 3) Modify the GCTS physical configuration (i.e., emission stack) to assure compliance with the treatment system effluent standard of 6 parts per million (ppm) benzene;
- 4) Utilization of a carbon efficiency graph to determine the need for and timing of carbon bed change-outs (see Figure 4.0).

3.3 MODIFICATION THREE

At the time of this writing, C2 REM is preparing a TM for evaluation of the THT trigger level (Modification Three) that will summarize the results of a comprehensive assessment and evaluation of groundwater monitoring results. This TM will be utilized as justification for modification to the existing groundwater offsite institutional control trigger level.

3.4 MODIFICATION FIVE

At the time of this writing, C2 REM is preparing a TM to propose the use of the low flow/minimal drawdown technique during all future groundwater sampling activities (Modification Five). Specifically, C2 REM reviewed laboratory data and field observations obtained from the low flow/minimal drawdown technique (thirteenth and fourteenth groundwater monitoring events conducted on June 4, 2003 and November 20 and 25, 2003, respectively) and found it to be consistent in quality with those obtained using the high flow/fixed volume groundwater sampling technique (groundwater monitoring events one through twelve).

3.5 SUMMARY

C2 REM has developed the rationale for and achieved agency approval for Modification One (Groundwater Sampling Frequency), Modification Two (GCTS Carbon Replacement), and Modification Four (Site Visit Frequency). Modification Three (Evaluation of THT Trigger Level) and Modification Five (Low Flow Groundwater Sampling Technique) are currently in development and review. These modifications have resulted in a more efficient approach to ongoing OM&M activities at the Site and have provided more specific and valuable information regarding the functioning of the remedial systems. These Modifications will be discussed in greater detail in appropriate sections of this Report.

4.0 INSPECTIONS

Inspections were conducted in accordance with the O&M Plan (Section 4.0) which outlines required semi-annual and annual inspection procedures for: 1) the cover system, 2) Reinforced Earthen Slopes (RESs), 3) the GCTS, 4) surface and subsurface drainage systems, 5) perimeter fencing and irrigation, and 6) access roads.

C2 REM conducted inspection events on March 17, 2003 and December 10, 2003 to identify site system status and the need for any repairs, which are discussed in greater detail below. The results of each C2 REM inspection are recorded on the appropriate inspection forms and presented in Appendix C.

During the cover system inspection events, no unusual surface conditions such as cracking, significant settling, evidence of sump material, faulty irrigation system, erosion, or slope instability were observed. The results of C2 REM cover system inspection events are presented in Table 2.0. Additionally, the inspection of the cover system's RESs did not reveal any unusual slope instability, sloughing, or erosion of facia (see Table 3.0).

Inspections of the GCTS included observation of aboveground components including: 1) the inlet vacuum relief valves, 2) exterior of valve vaults, 3) process piping, and 4) carbon adsorption vessels including peripheral equipment. The results of the GCTS inspection events are presented in Table 4.0. On January 2, 2003 the blower motor unit was found inoperable and after evaluation was replaced on January 27, 2003 (see Section 9.0 for greater detail).

Surface water drainage is controlled and managed through the use of a detention pond, contoured grades, catch basin, concrete lined V-ditches, and subsurface drainage pipes. C2 REM inspected these items to identify the presence of cracks, erosion of contoured grade, sediment build-up, plugging, structural failure, and/or accumulation of vegetative debris (see Tables 5.0 and 6.0). Results of the inspection identified two areas of the V-ditch that incurred structural damage from settlement between the joints (see Figures 5.0

and 6.0). Repair work on these sections was completed on March 7, 2003 (see Section 9.0 for greater detail).

Inspections of the perimeter fence and gates were performed to identify breaks or failures in the perimeter fencing system. The access road was assessed to determine any structural deterioration or structural failure. C2 REM did not observe any damage to perimeter fence/gate or access road (see Tables 7.0 and 8.0).

5.0 MONUMENT SURVEY EVENT

A baseline survey record of the Site was previously established to monitor and track ground movement and settlement. A monument survey event was conducted yearly for the first five years of operation (1998 through 2002) in accordance with the O&M Plan at the McColl Superfund Site. Pursuant to the O&M Plan, monument survey events will be conducted once every 5 years, after the first five years, since primary compression of the cover system is complete. Since 2003 was the sixth year, C2 REM reviewed the results obtained during the previous monument survey event and decided that no monument survey event need be conducted in the year 2003, see *2002 Operation, Maintenance, and Monitoring Annual Report, C2 REM, May 1, 2003* (C2 REM, 2003b). The next monument survey event is scheduled for the year 2007.

6.0 CAP GAS COLLECTION AND TREATMENT SYSTEM OPERATION

6.1 OBJECTIVES

The GCTS monitoring activities have been conducted to: 1) assess the treatment efficiency of the GCTS in the collection of fugitive soil vapor emissions in the sand layer of the cap; and 2) maintain balanced flow conditions through the system. Monitoring activities were conducted in accordance with Section 7.0 of the O&M Plan.

6.2 BI-MONTHLY CAP GAS MONITORING

In an effort to assess the performance and treatment efficiency of the GCTS, bi-monthly monitoring was conducted from four sample locations (i.e., system influent #1, outlet/effluent of the lead carbon vessel #2, outlet/effluent of the lag carbon vessel #3, and system effluent #4). A photo ionization detector (PID) (calibrated to 5.0 ppm benzene) was used to detect the VOC concentration at each of the four sample locations. As indicated in Table 9.0 system influent samples ranged from 6.5 ppm to 28.2 ppm, while system effluent samples ranged from 0.4 ppm to 5.5 ppm. The system effluent requirement for the GCTS is a maximum of 6 ppm benzene during an 8-hour operational period, per Modification Two. The low concentrations detected at the system's effluent demonstrate the carbon vessels' efficiency in reducing VOC concentrations. The overall system efficiency was 82%, calculated as the average from all of the 2003 bi-monthly monitoring events. Copies of the GCTS monitoring forms are presented on Appendix D.

6.3 CARBON BED CHANGE-OUT PROTOCOL

As discussed previously in Section 3.0, the USEPA approved a carbon bed change-out protocol (Modification Two) for the GCTS based on system efficiency and system effluent limitations (see Appendix B). C2 REM developed a graphical representation of this procedure that will determine carbon bed change-out frequency (see Figure 4.0). As indicated in Figure 4.0, a lead carbon vessel to system influent concentration ratio has been prepared for system influent concentrations up to 30 ppm and overall system efficiencies from 1% to 100%.

This will allow the field observer to “plot” the system's lead carbon vessel to system influent concentrations and apply the generated curves (and corresponding areas of action or inaction) to determine when system influent concentration and overall system efficiencies will trigger carbon bed change-out. When the observed system influent concentration and lead carbon vessel efficiency results fall within Zone 2 (the intermediate carbon replacement area) for three consecutive monitoring events or in Zone 3 (the carbon replacement area) during two monitoring events (i.e., first day observed and

a follow-up the next day to confirm system operation and monitoring equipment calibration), then carbon in the lead carbon vessel shall be replaced (see Figure 4.0). Following the carbon-replacement in the lead carbon vessel, the GCTS piping will be adjusted so that the carbon refreshed lead carbon vessel will become the lag carbon vessel, and the former lag carbon vessel will become the lead carbon vessel.

No carbon vessels were replaced during this operational year (January 2003 to December 2003).

6.4 GAS COLLECTION PRESSURE PROBES

As part of the monitoring activities for the GCTS, twelve pairs of Gas Pressure Probes (GPPs) and Gas Sample Probes (GSPs) were monitored on a semi-annual basis. The probes were previously placed at various depths depending on the sump depth at each location (see Table 10.0). The GPPs and GSPs are at separate locations but are paired together in the proximate area. The function of the GPPs is to obtain subsurface pressure readings within the containment system while the function of the GSPs is to obtain subsurface pressure readings immediately outside the containment system. On May 15, 2003 and November 24, 2003, C2 REM measured the differential pressure between the paired probes. In addition, field instruments were used to monitor VOCs and SO₂ at each probe (see Table 11.0). The differential pressure readings between the GPPs and GSPs pairs ranged between -0.077 psi and 0.04 psi. The low to zero pressure buildup, along with the low concentrations of VOCs and SO₂ demonstrate that the containment system and GCTS are functioning as designed and are consistent with results from previous monitoring events (see Figure 7.0).

6.5 GCTS MECHANICAL PROCESS MONITORING

In an effort to assess that the GCTS is operating properly, a programmable logic controller (PLC) with a human/machine interface software (RSView 32) program was previously installed. This system provides electrical and operational data (i.e., start time, average kilowatts [KW], and usage kilowatts per hour [KwHr]) and is capable of

automatically “calling out” if the GCTS is functioning outside its normal parameters. The 2003 GCTS Usage Report is presented in Appendix E. On average, the GCTS is consuming approximately 24,000Kw/Hr of electrical energy per year.

6.6 ANNUAL CONFIRMATION SAMPLING EVENT

As outlined in OM&M TM Modification Two, C2 REM recommended that an annual confirmation sampling event be established to ensure the effectiveness of field monitoring (C2 REM, 2003a). Samples will be collected from each of the four sampling ports in 6-Liter SUMMA canisters (i.e., System Influent, Outlet/Effluent Lead Vessel, Outlet/Effluent Lag Vessel, System Effluent). Samples will be transported to a fixed laboratory and analyzed using USEPA Method TO-15 for VOCs in vapor phase. Annual confirmation sampling data is valuable to evaluate the effectiveness of the field PID readings and verify acceptable effluent conditions. An annual confirmation sampling event will be conducted in March 2004.

7.0 GROUNDWATER MONITORING

7.1 OBJECTIVES

Groundwater monitoring activities have been conducted to assess and characterize the concentrations of COCs in the A, B, C, and D zone aquifers and demonstrate that the infiltration controls are effectively preventing the migration of site contaminants to the regional aquifer.

7.2 2003 GROUNDWATER MONITORING EVENTS

C2 REM conducted three groundwater monitoring events (subsequent to but in series with previous groundwater sampling) at the Site, the twelfth event on February 27 and March 6, 2003, the thirteenth event on June 4, 2003, and the fourteenth event on November 20 and 25, 2003.

These events were conducted in accordance with the recent USEPA-approved modification to the groundwater monitoring program (see Appendix A). Due to the timing of approval of Modification One, the twelfth groundwater monitoring event was conducted in 2003 but was part of the 2002 groundwater monitoring requirements for the Site (C2 REM, 2003b).

The revised groundwater monitoring frequency scope (outlined in Appendix A) is provided in Table 1.0. Wells P-2I, P-10D, P-10L, and P-10XD were sampled and analyzed during the twelfth and thirteenth groundwater monitoring events. During the fourteenth groundwater monitoring event, wells P-2I, P-5I, P-10D, P-9D, P-10L, P-5D, P-10XD, W-10B, P-5L, and W-9C were sampled and analyzed. The samples from each of the three 2003 events were analyzed using USEPA Method 8260 (including THTs), USEPA Method 6010, USEPA Method 7470, and USEPA Method 300. The results from 2003 groundwater monitoring events are presented in Tables 12.0 and 13.0, and in Appendix F. Additionally, all twenty (20) monitoring wells were gauged for depth to groundwater during each of the three events (see Table 14.0). Subsequent to the three monitoring events, the following observations were made:

- Site wide groundwater elevations from the 2003 groundwater monitoring events were similar with those observed during the previous years groundwater monitoring events (see Figure 8.0).
- The concentrations of VOCs, specifically BTEX, exhibited a drop or remained at a steady state concentration range (see Figures 9.0 and 10.0). During the thirteenth and fourteenth groundwater monitoring events, benzene concentrations ranged from 83 ug/L to 84 ug/L at well P-2I (as compared to 96 ug/L and 110 ug/L during the 2002 monitoring events). During the November 2003 monitoring event, well P-10L was non detect (ND) and a duplicate sample was 0.57 ug/L compared to the 2002 ND measurement. Well P-10D experienced a decrease in concentration from

0.9 ug/L in 2002 to ND in 2003. Consistent with 2002 analytical results, the 2003 benzene concentrations were ND in all other wells sampled.

- The resulting trend analysis for THTs (THT, 2-THT, and 3-THT) exhibited a declining or steady state trend in concentrations (see Figures 11.0 and 12.0). During the 2003 groundwater monitoring events, THT concentrations ranged from 4.4 ug/L (P-10L) to 400 ug/L (P-2I); 2-THT concentrations were ND at all of the wells sampled; and 3-THT concentrations ranged from 9.8 ug/L (P-10L) to 670 ug/L (P-2I).
- The resulting trend analysis of metals exhibited a continued steady state trend in concentrations (see Figures 13.0 and 14.0). During the three 2003 groundwater monitoring events, C2 REM noted the following metals near or slightly above the MCL level: arsenic concentrations at 180, 200, and 320 ug/L (P-2I); beryllium concentrations at 61, 110 and 120 ug/L (P-2I); chromium concentrations at 74 ug/L (P-10XD) and 75 ug/L (P-2I); nickel concentrations of 950, 1100, and 1200 ug/L (P-2I) and 170 ug/L (P-10D); and selenium concentrations at 64 ug/L (P-9D).

7.3 LOW FLOW GROUNDWATER SAMPLING TECHNIQUE

C2 REM, with approval from the USEPA, monitored groundwater wells during the thirteenth (June 6, 2003) and fourteenth (November 20 and 25, 2003) groundwater monitoring events using a low flow/minimal drawdown sampling technique (as described in Appendix G) rather than the traditional high-flow/fixed volume technique in an effort to assess its feasibility for use during future groundwater monitoring events.

C2 REM is currently reviewing the laboratory analytical data and field observations from these events and is preparing to submit a TM (Modification Five) to the USEPA outlining the results and recommendations from this assessment.

8.0 ROUTINE MAINTENANCE

8.1 OBJECTIVES

C2 REM conducted routine system wide maintenance to: 1) reduce the probability of malfunction; 2) to provide for a mechanism of early detection; 3) repair identified system failures; and 4) to ensure the efficient management of OM&M activities (see Appendix H for completed Maintenance Request Forms).

8.2 COVER SYSTEM

Routine maintenance of the cover system included control of undesirable weeds and vegetation, eradication of burrowing animals, replanting and reseeded of ground cover, and inspection of the irrigation system. This maintenance was conducted as part of the normal property maintenance by LCCC employees with daily access to the Site.

8.3 CAP GAS COLLECTION AND TREATMENT SYSTEM

C2 REM conducted bi-monthly visual observations of GCTS aboveground components and the enclosure to identify any potential maintenance requirements and/or repairs. On January 2, 2003, the blower motor unit was found inoperable and, following evaluation, was replaced on January 27, 2003 (see Section 9.0 for greater detail). Additionally, on December 4, 2003 C2 REM completed minor modifications to the effluent stack of the GCTS in accordance with USEPA-approved modifications to the existing carbon bed change-out protocol (see Figure 15.0 and Appendix B).

8.4 SURFACE AND SUBSURFACE DRAINAGE SYSTEMS

As part of the scheduled landscape care and maintenance of the cover system, the surface and subsurface drainage systems were regularly cleaned and any vegetative debris was removed and disposed. Two portions of the concrete drainage swale exhibiting

settlement were removed and replaced by C2 REM in March 2003 (see Section 9.0 for greater detail).

8.5 ACCESS RAOD

The access road was regularly examined for surface cracks and settlement. No additional maintenance or repair of the access road was required.

8.6 SECURITY FENCE

The security fence was regularly examined for damage or needed repair as part of the normal property maintenance by LCCC employees with daily access to the Site.

9.0 REPAIRS

9.1 OBJECTIVES

In an effort to ensure the integrity of the implemented remedy, C2 REM regularly identified and repaired failed or nonfunctional components of the remedy pursuant to Section 9.0 of the O&M Plan.

9.2 REQUIRED REPAIRS

The cover system, as well as other systems subject to inspection and assessment, did not require any significant repair procedures, excluding the GCTS blower motor and electrical components and portions of the surface drainage system.

9.2.1 GCTS BLOWER MOTOR AND ELECTRICAL COMPONENT REPAIR

As mentioned previously, the blower motor was found inoperable and replaced in January 2003. A new blower motor equal to the quality and functionality of components identified in Appendix E of the O&M Plan was purchased from Baldor Electric Company. C2 REM installed a new blower motor and replaced a damaged contactor

from the control unit making the GCTS once again operational on January 29, 2003. Subsequent monitoring of the GCTS indicates that the new blower motor is functioning as designed.

Additional repairs to the mechanical/electrical components of the GCTS completed during the year 2003 included: the replacement of fuses inside the control unit of GCTS, replacement of the modem and the APC Battery Back UPS unit inside the PLC, and replacement of vacuum gauges located on the outlet of both the primary and secondary carbon vessels.

9.2.2 SURFACE DRAINAGE SYSTEM REPAIR

Based on field observations and discussions with USACOE, it was determined that select sections of concrete drainage swale required repair due to settlement and cracking. A portion of the concrete drainage swale along the Rampart parcel of the Site exhibited approximately 5” of settlement, while a portion of the concrete drainage swale along the Los Coyotes parcel exhibited 3” to 4” of settlement (see Figures 5.0 and 6.0). C2 REM removed, disposed, and replaced four concrete sections (approximately 10 feet each) with the appropriate materials (i.e., concrete, mesh steel, joint compound, and connection devices). Repair work on these portions of the concrete drainage swale was completed on March 7, 2003. Subsequent inspections of the Site indicated that the repair activities were successful in replacing structural deficiencies while maintaining the integrity of the surface drainage system.

10.0 CONCLUSIONS AND RECOMMENDATIONS

Following the sixth year of operation, the implemented remedy is functioning as designed. Regularly scheduled inspections, monitoring, and maintenance activities have assisted in early identification of possible repair issues. Issues that were identified (i.e., GCTS blower motor and electrical/mechanical components, concrete drainage swales, etc.) have been rectified and to date the cover system and other associated systems are

operational and functioning as designed. Future inspection and monitoring activities shall be conducted in accordance with the schedule provided on Table 15.0.

The 2003 groundwater monitoring results continue to support the modifications approved by the USEPA, and shall continue to be performed in accordance with the frequency and scope outlined in Table 1.0. Based on no detectable loss in operational efficiency and remedy efficacy from reducing Site visits from weekly to twice-monthly, Site visits will continue to occur twice-monthly as recommended in Modification Four (Site Visit Frequency) approved by the USEPA. C2 REM will continue to assess the protocol for carbon bed change-out utilizing a defined relationship between system efficiency and permissible emission limits to determine change-out timing of carbon beds at the Site.

Additionally, C2 REM shall continue to work with USEPA and USACOE in completing the tasks outlined in OM&M Modification Three (Evaluation of THT Trigger Level) and is currently preparing a TM to summarize the results of comprehensive assessment and evaluation of groundwater monitoring results, which will be utilized to outline a proposed modification to the existing groundwater offsite institutional control trigger mechanism.

Finally, C2 REM is preparing a TM to submit to USEPA, which provides an assessment of a low flow/minimal drawdown technique and recommends its use during future groundwater monitoring events.

11.0 REFERENCES

C2 REM, *Phased Technical Memorandum, Proposed OM&M Modifications*, December 17, 2002 (C2 REM, 2002).

C2 REM, *2002 Operation, Maintenance, and Monitoring Annual Report*, May 1, 2003 (C2 REM, 2003b).

C2 REM, *Technical Memorandum, Operation, Maintenance, and Monitoring (OM&M) Modification #2 Proposed Carbon Bed Change-Out Protocol*, October 14, 2003 (C2 REM, 2003a).

Environ Corporation, *Final Remedial Investigation Report Groundwater Operable Unit, McColl Site*, December 1995 (Environ, 1995).

Parsons Engineering Science, *Operations and Maintenance Plan McColl Superfund Site*, October 15, 1997 (O&M Plan).

U.S. Environmental Protection Agency, *Record of Decisions R09-93/095-Soil Debris*, June 30, 1993 (USEPA, 1993).

U.S. Environmental Protection Agency, *Record of Decisions R09-96/154-Groundwater*, May 15, 1996 (USEPA, 1996b).

U.S. Environmental Protection Agency, *Administrative Order 96-10 for Remedial Design and Remedial Actions, McColl Superfund Site, Fullerton, California*, July 1996 (USEPA, 1996a).

TABLE 1.0
REVISED GROUNDWATER MONITORING
WELL SAMPLING EVENT SCOPE AND FREQUENCY
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

Well Identification Number	Intercepted Water-Bearing Zone	Revised Sampling Status		
		Water Level Measurement (Semi -Annually)	Sampling for COCs ⁽¹⁾ (Annually)	Sampling for COCs ⁽¹⁾ (Bi-Annually)
P-2S	A	●		
P-3S	A	●		
P-2I	B	●	●	
P-4I	B	●		
P-5I	B	●		●
P-5S	B	●		
P-10D	B	●	●	
P-2DR	C	●		
P-3D	C	●		
P-4D	C	●		
P-5L	C	●		●
P-9D	C	●		●
P-10L	C	●	●	
W-6A	C	●		
P-5D	D	●		●
W-8B	D	●		
P-10XD	D	●	●	
W-9B	D	●		●
W-9C	D	●		●
W-10B	D	●		●

⁽¹⁾ Samples shall be submitted for chemical analysis for VOCs using USEPA Methods 8260 (including Tetrahydrothiophenes), for metals using USEPA Method 6010, for mercury using USEPA Method 7470, and for general physical and chemical properties using USEPA

**TABLE 2.0
COVER SYSTEM INSPECTION SUMMARY
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA**

Cover System Inspection Form		
McColl Superfund Site	03/17/03 Conditions/ Remarks	12/10/03 Conditions/ Remarks
Inspection Type	Post-Rain Inspection	Annual Site Inspection
Inspection Items		
<i>Erosion</i>	4	4
<i>Stressed Vegetation (Plant Die-Back)</i>	4	4
<i>Sediment Build-Up</i>	3	4
<i>Local Subsidence or Loss of Grade</i>	4	4
<i>Water Ponding</i>	4	4
<i>Turf Height</i>	4	4
<i>Burrowing Animals</i>	4	4
<i>Weeds or Undesirable Vegetation</i>	4	4
<i>Evidence of Fires or Vandalism</i>	4	4
<i>Soil Quality Check</i>	4	4
<i>Unauthorized Traffic</i>	4	4
<i>Slope Instability or Sloughing</i>	4	4
<i>Irrigation System</i>	4	3
<i>Survey Monuments</i>	4	4
<i>Vertical Cracking</i>	4	4
<i>Intrusions</i>	4	4
<i>Evidence of Sump Materials</i>	4	4

Conditions/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Repair)

1 = Poor (Needs Immediate Repair)

TABLE 3.0
REINFORCED EARTHEN SLOPE INSPECTION SUMMARY
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

Reinforced Earthen Slope Inspection Form		
McColl Superfund Site	03/17/03 Conditions/ Remarks	12/10/03 Conditions/ Remarks
Inspection Type	Post-Rain Inspection	Annual Site Inspection
Inspection Items		
<i>Erosion of Facia</i>	4	4
<i>Stressed Vegetation (Plant Die-Back)</i>	4	3
<i>Weeds or Undesirable Vegetation</i>	4	4
<i>Slope Instability or Sloughing</i>	4	4

Conditions/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Repair)
1 = Poor (Needs Immediate Repair)

**TABLE 4.0
GCTS INSPECTION SUMMARY
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA**

GCTS Inspection Form		
McColl Superfund Site	03/17/03 Conditions/ Remarks	12/10/03 Conditions/ Remarks
Inspection Type	Post-Rain Inspection	Annual Site Inspection
Inspection Items		
<i>Excess Sediment Build-Up and Vegetation Growth Over Inlet Vacuum Relief Valves</i>	4	4
<i>Erosion or Washout Around Relief Valves</i>	4	4
<i>Damaged Inlet Vent Pipe</i>	4	4
<i>Excess Sediment Build-Up and Vegetation Growth Over Valve Vaults</i>	4	4
<i>Erosion or Washout Around Valve Vaults</i>	4	4
<i>Damaged Process Pipe(s) or Vessels on GCTS</i>	4	4

Conditions/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Repair)
1 = Poor (Needs Immediate Repair)

TABLE 5.0
SURFACE WATER DRAINAGE INSPECTION SUMMARY
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

Surface Water Drainage Inspection Form		
McColl Superfund Site	03/17/03 Conditions/ Remarks	12/10/03 Conditions/ Remarks
Inspection Type	Post-Rain Inspection	Annual Site Inspection
Inspection Items		
<i>Dislodged Riprap</i>	4	4
<i>Washouts or Erosion of Contoured Grade</i>	4	4
<i>Ponding on Contoured Grade</i>	4	4
<i>Sediment Build-Up on Riprap</i>	4	4
<i>Gullies and Ruts on Contoured Grade</i>	4	4
<i>Plugging of Drainage Culverts</i>	4	4
<i>Holes and Cracks in V-Ditches or Catch Basin ⁽¹⁾</i>	4	3
<i>Sediment Build-Up in V-Ditches or Catch Basin ⁽²⁾</i>	4	3
<i>Foreign Objects in Detention Pond</i>	4	4
<i>Washout at Southern Back of Detention Pond</i>	4	4
<i>Surface Cracking of V-Ditches or Catch Basins ⁽¹⁾</i>	4	4
<i>Spalling of V-Ditches or Catch Basins</i>	4	4
<i>Structural Failure of V-Ditches or Catch Basins</i>	4	4

⁽¹⁾ Two areas of V-ditch repaired March, 2003.

⁽²⁾ Repair completed during routine maintenance.

Conditions/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Repair)

1 = Poor (Needs Immediate Repair)

TABLE 6.0
SUBSURFACE DRAINAGE INSPECTION SUMMARY
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

Subsurface Drainage Inspection Form		
McColl Superfund Site	03/17/03 Conditions/ Remarks	12/10/03 Conditions/ Remarks
Inspection Type	Post-Rain Inspection	Annual Site Inspection
Inspection Items		
<i>Holes and Cracks in V-Ditches, PE Manhole or Catch Basin ⁽¹⁾</i>	4	4
<i>Plugging of Drainage Inlets</i>	4	4
<i>Sediment Build-Up or Debris in PE Manhole or Catch Basin ⁽²⁾</i>	3	4
<i>Structural Failure of PE Manhole or Catch Basin</i>	4	4

⁽¹⁾ Two areas of V-ditch drainage structure repaired March, 2003.

⁽²⁾ Repair completed during routine maintenance.

Conditions/Remarks Key:

4 = Satisfactory

3 = Slight (Continue Observing)

2 = Moderate (Needs Scheduled Repair)

1 = Poor (Needs Required Repair)

**TABLE 7.0
SECURITY FENCE INSPECTION SUMMARY
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA**

Security Fence Inspection Form		
McColl Superfund Site	03/17/03 Conditions/ Remarks	12/10/03 Conditions/ Remarks
Inspection Type	Post-Rain Inspection	Annual Site Inspection
Inspection Items		
<i>Perimeter Fence</i>		
<i>Breaks and Holes</i>	4	4
<i>Settlement Damage</i>	4	4
<i>Loose Posts/Tension</i>	4	4
<i>Rust/Corrosion</i>	4	4
<i>Ruts and Burrows Beneath Fence</i>	4	4
<i>Vegetation Overgrowth</i>	4	4
<i>General Signs of Deterioration</i>	4	4
<i>Vandalism/Animal/Wind Damage</i>	4	4
<i>Gates</i>		
<i>Adequate Movement of Hinges and Gates</i>	4	4
<i>Proper Function of Lock(s)</i>	4	4
<i>Irrigation</i>		
<i>Leaks</i>	4	4
<i>Other Malfunctions</i>	4	4

Conditions/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Repair)
1 = Poor (Needs Immediate Repair)

**TABLE 8.0
ACCESS ROAD INSPECTION SUMMARY
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA**

Access Road Inspection Form		
McColl Superfund Site	03/17/03 Conditions/ Remarks	12/10/03 Conditions/ Remarks
Inspection Type	Post-Rain Inspection	Annual Site Inspection
Inspection Items		
<i>Holes and Cracks</i>	4	4
<i>Vegetation Overgrowth</i>	4	4
<i>Settlement</i>	4	4
<i>Structural Failure</i>	4	4
<i>General Signs of Deterioration</i>	4	4

Conditions/Remarks Key:
4 = Satisfactory
3 = Slight (Continue Observing)
2 = Moderate (Needs Scheduled Repair)
1 = Poor (Needs Immediate Repair)

TABLE 9.0
PID READINGS AND EFFICIENCY OF CARBON VESSELS
JANUARY 2003 THROUGH DECEMBER 2003
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

Date	Connection #1 Influent Sample (System Inlet) VOCs (ppm)	Connection #2 Intermediate Sample (outlet of carbon vessel A) VOCs (ppm)	Lead Vessel Efficiency Based on Monitoring Results	Connection #3 Intermediate Sample (outlet of carbon vessel B) VOCs (ppm)	Connection #4 Effluent Sample (system outlet) VOCs (ppm)	System Efficiency Based on Monitoring Results
1/30/2003	6.5	3.6	44.6%	2.1	1.8	72%
2/6/2003	8.6	0.8	90.7%	0.5	0.4	95%
2/20/2003	10.1	3.4	66.3%	2.1	1.9	81%
3/6/2003	9.2	5.7	38.0%	2.5	1.9	79%
3/21/2003*	11.4	6.7	41.2%	5.2	5.5	52%
4/3/2003	7.3	1.6	78.1%	1.5	1.5	79%
4/17/2003	7.7	2.3	70.1%	1.5	1.3	83%
5/1/2003	9.0	1.8	80.0%	1.0	0.9	90%
5/15/2003	8.4	1.6	81.0%	1.0	1.0	88%
6/12/2003	17.2	8.9	48.3%	3.5	3.4	80%
6/19/2003	16.7	6.8	59.3%	3.8	3.6	78%
6/26/2003	10.5	3.6	65.7%	1.3	1.0	90%
7/9/2003	8.6	3.2	62.8%	2.0	1.3	85%
7/21/2003	11.8	5.3	55.1%	3.8	2.7	77%
7/31/2003	12.3	5.2	57.7%	2.9	1.8	85%
8/14/2003	22.9	3.4	85.2%	3.0	3.0	87%
10/1/2003	12.2	3.7	69.7%	2.2	2.2	82%
10/24/2003	22.6	4.8	78.8%	4.7	4.3	81%
11/6/2003	28.2	5.7	79.8%	4.8	4.2	85%
11/24/2003	22.8	5.3	76.8%	4.4	1.4	94%
12/4/2003	22.1	9.0	59.3%	18.1	4.2	81%
12/19/2003	12.2	10.0	18.0%	NR	1.8	85%

Monitoring results conducted by C2 REM using PID calibrated to 5 ppm benzene.

*Possible error with readings due to water vapor affecting PID.

Total System Efficiency = 82 %

**TABLE 10.0
LOCATION OF GAS PRESSURE PROBES
AND GAS SAMPLING PROBES
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA**

General Location		Identification Number	Approximate Depth Below Top of Cap To Top of Screen ¹			
			Gas Pressure Probes (ft)	Gas Sampling Probes Shallow (ft)	Gas Sampling Probes Deep (ft)	
RAMPARTS CAP	Lower Ramparts	Ramparts Sump R-1	GPP-9, GSP-9	39	14	35
		Ramparts Sump R-2	GPP-3, GSP-3	38.0	6.5	20.0
		Ramparts Sump R-4	GPP-1, GSP-1	43.0	16.0	39.0
			GPP-2, GSP-2	35.0	10.5	28.0
	Upper Ramparts	Ramparts Sump R-5	GPP-10, GSP-10	29.0	9.5	26.0
		Ramparts Sump R-6	GPP-11, GSP-11	38.0	13.0	33.0
			GPP-12, GSP-12	36.0	12.5	32.0
LOS COYOTES CAP	Los Coyotes Sump L-1	GPP-4, GSP-4	26.0	6.5	20.0	
	Los Coyotes Sump L-2	GPP-5, GSP-5	25.0	6.0	19.0	
	Los Coyotes Sump L-3	GPP-6, GSP-6	32.0	10.5	28.0	
	Los Coyotes Sump L-4	GPP-7, GSP-7	23.0	3.5	0.0	
	Los Coyotes Sump L-6	GPP-8, GSP-8	49.0	10.5	28.0	

¹ Source of information: design drawings (Parsons, 1997). See record drawings for actual depths.

Note: Each screen is 5 feet in length.

TABLE 11.0
GAS SAMPLE PROBE AND GAS PRESSURE PROBE MONITORING RESULTS
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

Probe Location	Date	GPP (psi)	GSP Shallow (psi)	GSP Deep (psi)	Differential Pressure Shallow (psi)	Differential Pressure Deep (psi)	VOCs GPP (ppm)	VOCs GSP Shallow (ppm)	VOCs GSP Deep (ppm)	SO ₂ GPP (ppm)	SO ₂ GSP Shallow (ppm)	SO ₂ GSP Deep (ppm)
1	5/15/2003	0.010	0.000	0.000	0.010	0.010	0.00	1.50	4.70	0.00	0.00	0.00
	11/24/2003	0.008	-0.019	0.004	0.027	0.004	0.80	2.00	4.70	0.00	0.00	0.00
2	5/15/2003	0.022	0.007	0.001	0.015	0.021	1.20	0.00	0.00	0.00	0.00	0.00
	11/24/2003	-0.069	0.001	0.009	-0.070	-0.077	3.20	0.00	1.70	0.00	0.00	0.00
3 ⁽¹⁾	5/15/2003	0.043	0.015	0.010	0.028	0.034	0.00	1.00	4.70	0.00	0.00	0.00
	11/24/2003	0.033	0.000	0.001	0.033	0.032	2.00	0.00	0.40	0.00	0.00	0.00
4	5/15/2003	0.001	0.000	-0.001	0.000	0.001	2.50	3.90	6.60	0.10	0.10	0.10
	11/24/2003	-0.007	-0.001	0.007	-0.006	-0.014	4.40	0.80	17.50	0.00	0.00	0.00
5	5/15/2003	-0.002	-0.001	-0.002	-0.001	0.000	1.60	2.50	2.60	0.00	0.10	0.20
	11/24/2003	-0.001	-0.001	-0.001	0.000	0.001	1.10	1.30	3.10	0.00	0.00	0.00
6	5/15/2003	0.003	-0.001	-0.002	0.004	0.005	0.00	0.40	4.80	0.10	0.00	0.00
	11/24/2003	0.005	0.009	0.010	-0.004	-0.005	0.20	1.60	3.60	0.00	0.00	0.00
7	5/15/2003	0.007	0.007	0.007	0.000	0.000	0.40	0.60	0.00	0.00	0.00	0.00
	11/24/2003	0.000	0.018	0.021	-0.018	-0.021	0.20	2.20	3.20	0.00	0.00	0.00
8 ⁽¹⁾	5/15/2003	-0.002	0.001	0.001	-0.003	-0.003	2.30	0.00	3.80	0.00	1.00	0.00
	11/24/2003	0.003	0.011	0.015	-0.008	-0.012	0.40	0.80	2.20	0.00	0.00	0.00
9	5/15/2003	0.004	0.001	0.007	0.003	-0.003	4.80	0.00	0.40	0.00	0.00	0.00
	11/24/2003	0.002	0.014	0.004	-0.012	-0.001	3.20	0.70	0.80	0.00	0.00	0.00
10	5/15/2003	0.051	0.021	0.010	0.030	0.040	0.00	0.00	0.00	0.00	0.00	0.00
	11/24/2003	-0.101	-0.030	0.016	-0.072	-0.117	0.00	1.00	0.00	0.00	0.00	0.00
11	5/15/2003	0.051	0.009	0.011	0.041	0.040	0.00	1.20	3.20	0.00	0.00	0.00
	11/24/2003	-0.072	-0.006	-0.013	-0.066	-0.059	0.00	3.30	7.80	0.00	0.00	0.00
12	5/15/2003	0.000	0.000	0.000	0.000	0.000	1.10	1.30	2.80	0.00	0.00	0.00
	11/24/2003	0.002	0.023	0.006	-0.021	-0.004	1.10	2.80	3.20	0.00	0.00	0.00

(1) There was no identifying markings for GSP-3 and GSP-8 as to which probes were shallow or deep. C2 REM does not have access to probe installation logs but has placed the data for the southern most probe in the shallow column and the data for the northern most probe in the deep column.

TABLE 12.0
2003 GROUNDWATER MONITORING RESULTS-VOCS
FULLERTON, CALIFORNIA

Sample Event	Well Location	USEPA Method 8260							USEPA Method 300.0			
		Acetone (ug/L)	Benzene (ug/L)	Carbon Disulfide (ug/L)	2-Butanone (MEK) (ug/L)	THT (ug/L)	2-THT (ug/L)	3-THT (ug/L)	Chloride (ug/L)	Nitrate-N (ug/L)	Nitrite-N (ug/L)	Sulfate (ug/L)
12th Groundwater Monitoring Event (2/27/03 & 3/6/03)	P-10D	ND	ND	ND	ND	92	ND	420	490000	1100	ND	1100000
	P-10L	ND	ND	ND	ND	4.4	ND	3	150000	ND	ND	230000
	P-10XD	ND	ND	ND	ND	ND	ND	ND	140000	ND	ND	210000
	P-2I	890	96	ND	640	400	ND	670	350000	ND	ND	9500000
13th Groundwater Monitoring Event (6/4/03)	P-10D	17	ND	ND	ND	ND	ND	ND	460000	2400	4100	330000
	P-10L	17	ND	ND	ND	ND	ND	ND	300000	490	2900	490000
	P-10XD	18	ND	ND	ND	ND	ND	ND	140000	ND	1600	120000
	P-2I	1300	83	ND	740	ND	ND	ND	370000	ND	ND	9200000
14th Groundwater Monitoring Event (11/20/25 & 11/25/03)	P-10D	ND	ND	ND	ND	ND	ND	ND	510000	1600	ND	200000
	P-10L	ND	ND	ND	ND	11	ND	22	310000	ND	ND	490000
	P-10L dup	ND	0.57	ND	ND	17	ND	9.8	300000	ND	ND	490000
	P-10XD	ND	ND	ND	ND	ND	ND	ND	150000	ND	ND	130000
	P-2I	560	84	ND	430	290	ND	460	370000	ND	ND	9200000
	P-5I	ND	ND	ND	ND	ND	ND	ND	500000	9500	ND	130000
	P-9D	ND	ND	ND	ND	ND	ND	ND	360000	6100	ND	120000
	P-5D	ND	ND	ND	ND	ND	ND	ND	89000	ND	ND	89000
	W-10B	ND	ND	ND	ND	ND	ND	ND	120000	ND	ND	520000
P-5L	ND	ND	7.1	ND	ND	ND	ND	100000	ND	ND	3700	
W-9C	ND	ND	ND	ND	ND	ND	ND	56000	ND	ND	62000	

ND=Analyte Not Detected at or above the reporting limit.

Note: Additional VOCs excluded from the table were not detected in any of the wells.

TABLE 13.0
2003 GROUNDWATER MONITORING RESULTS-METALS
MCCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

		USEPA Method 6010B																		
Sample Event	Well Location	Aluminum (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Calcium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Iron (ug/L)	Lead (ug/L)	Magesium (ug/L)	Manganese (ug/L)	Molybdenum (ug/L)	Nickel (ug/L)	Potassium (ug/L)	Selenium (ug/L)	Sodium (ug/L)	Thallium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)
12th Groundwater Monitoring Event (2/27/03 & 3/6/03)	P-10D	ND	ND	58	ND	380000	ND	ND	800	ND	150000	50000	ND	ND	5700	ND	250000	ND	ND	ND
	P-10L	ND	ND	54	ND	87000	ND	ND	82	ND	35000	310	ND	ND	5300	ND	180000	ND	ND	ND
	P-10XD	ND	8	69	ND	78000	ND	ND	320	ND	26000	170	21	ND	5200	ND	170000	ND	ND	ND
	P-2I	160000	200	ND	110	430000	ND	340	1300000	ND	1100000	74000	ND	1200	18000	ND	740000	ND	790	1300
13th Groundwater Monitoring Event (6/3/03)	P-10D	100	ND	79	ND	240000	ND	ND	150	ND	79000	12000	ND	170	7700	ND	220000	ND	ND	ND
	P-10L	60	ND	86	ND	150000	ND	ND	330	ND	63000	710	ND	ND	10000	5	240000	ND	ND	ND
	P-10XD	ND	9	64	ND	64000	20	ND	430	ND	22000	140	20	28	6000	ND	140000	ND	ND	ND
	P-2I	200000	180	ND	110	400000	75	320	1300000	52	1100000	69000	ND	1100	22000	ND	680000	ND	740	990
14th Groundwater Monitoring Event (11/20/25 & 11/25/03)	P-10D	ND	ND	78	ND	220000	ND	ND	ND	ND	66000	5200	ND	170	7100	ND	240000	ND	ND	ND
	P-10L	ND	ND	87	ND	160000	ND	ND	150	ND	63000	770	ND	ND	9000	ND	270000	ND	ND	21
	P-10L dup	ND	ND	86	ND	160000	ND	ND	220	ND	63000	780	ND	ND	9000	ND	270000	ND	ND	ND
	P-10XD	ND	8	67	ND	66000	74	ND	470	ND	23000	200	ND	85	5100	ND	160000	ND	ND	ND
	P-2I	530000	320	ND	120	410000	ND	300	1200000	ND	1100000	67000	ND	950	18000	ND	740000	ND	1100	880
	P-5I	ND	ND	160	ND	100000	12	44	180	ND	33000	23	25	27	5000	ND	360000	10	ND	ND
	P-9D	ND	ND	180	ND	100000	ND	6	210	ND	38000	72	ND	17	7200	64	240000	ND	ND	ND
	P-5D	ND	ND	38	ND	46000	ND	ND	ND	ND	9800	51	ND	ND	9200	ND	120000	ND	ND	ND
	W-10B	ND	ND	25	ND	150000	ND	10	9000	ND	61000	2100	71	34	7100	ND	87000	ND	ND	71
	P-5L	840	ND	190	ND	83000	ND	ND	880	ND	12000	100	ND	ND	7000	ND	120000	ND	ND	69
W-9C	58	ND	13	61	46000	ND	ND	260	ND	15000	65	35	ND	4100	ND	120000	ND	ND	ND	

ND=Analyte Not Detected at or above the reporting limit.

Note: Additional metals excluded from the table were not detected in any of the wells.

TABLE 14.0
2003 GROUNDWATER ELEVATION RESULTS
MCCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

Well ID #	Top of Casing Elevation (ft msl)	February 27 and March 6, 2003		June 4, 2003		November 20 and 25, 2003	
		DTW (ft)	Groundwater Elevation (ft msl)	DTW (ft)	Groundwater Elevation (ft msl)	DTW (ft)	Groundwater Elevation (ft msl)
P-10D	248.42	77.81	170.61	77.23	171.19	78.8	169.92
P-10L	248.63	172.65	75.98	178.57	70.06	180.52	68.11
P-10XD	247.12	171.83	75.29	181.60	65.52	180.5	66.62
P-2I	266.39	82.52	183.87	82.45	183.94	84.8	181.59
P-2S	266.46	Dry	-	26.4	240.06	Dry	-
P-3S	281.42	59.59	221.83	59.75	221.67	59.16	222.26
P-4I	283.34	73.42	209.92	73.56	209.78	83.07	200.27
P-5I	259.77	54.35	205.42	54.05	205.72	57.8	201.97
P-5S	259.26	63.87	195.39	63.21	196.05	64.01	195.25
P-2DR	266.15	185.36	80.79	189.56	76.59	192.1	74.05
P-3D	282.40	201.87	80.53	206.57	75.83	209.02	73.38
P-4D	282.53	DRY	-	206.67	75.86	209.18	73.35
P-5L	258.13	180.57	77.56	185.50	72.63	187.5	70.63
P-9D	263.26	184.62	78.64	189.11	74.15	191.95	71.31
W-6A	293.35	47.98	245.37	47.60	245.75	48.65	244.7
P-5D	259.40	151.55	107.85	151.51	107.89	151.88	107.52
W-8B	266.44	157.85	108.59	157.9	108.54	158.26	108.18
W-9B	316.71	NR	-	Dry	-	NR	-
W-9C	316.09	NR	-	Dry	-	190.02	126.07
W-10B	314.55	188.7	125.85	188.81	125.74	188.68	125.87

NR= Not Recorded

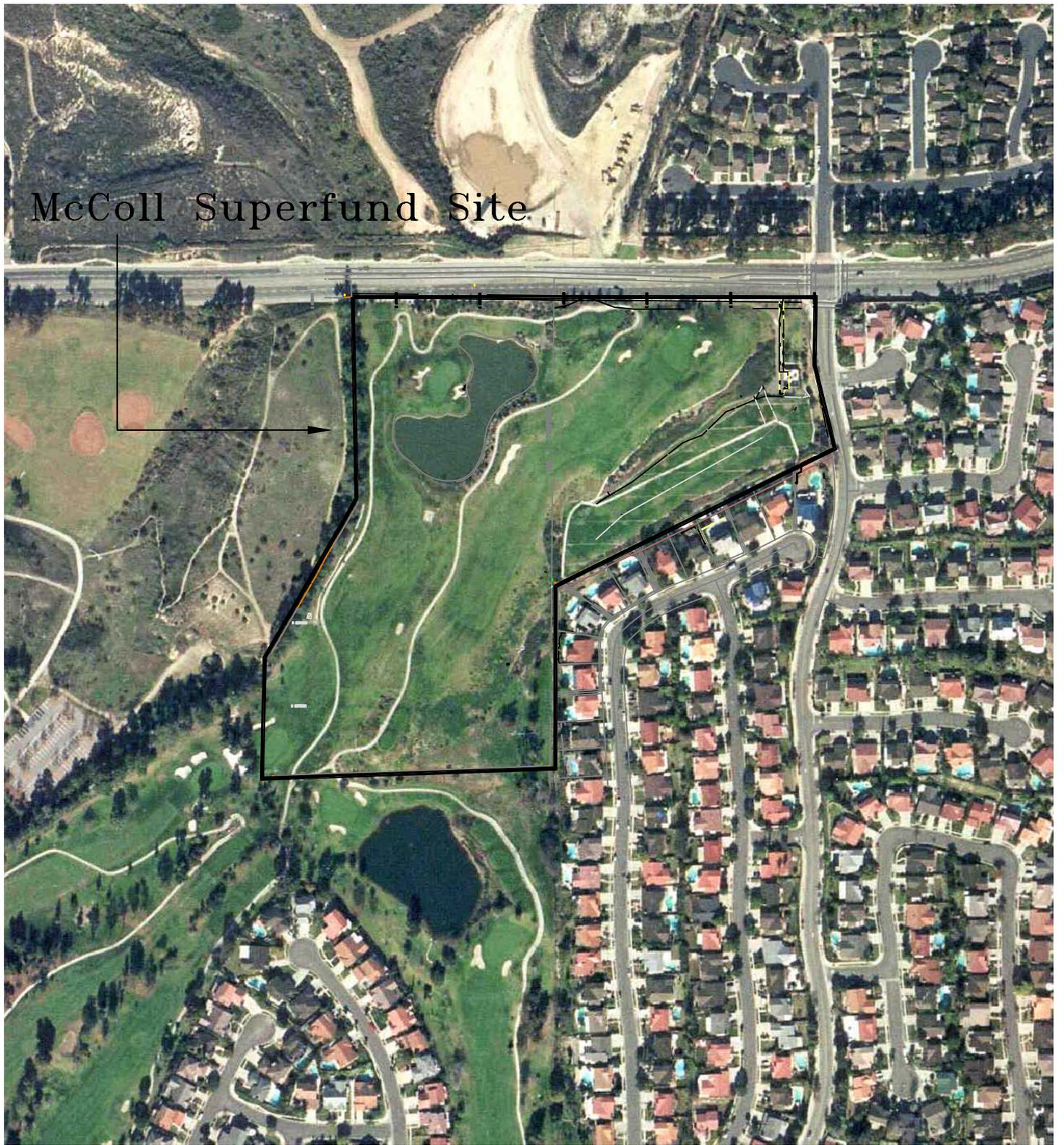
TABLE 15.0
SUMMARY OF OM&M EVENTS
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA

Event	Frequency of Event	Method of Documentation
Inspection:		
Cover System	Daily ⁽¹⁾	Notification Form if damage is observed
	Annually and after a seismic event and heavy rain ⁽²⁾	Cover System Inspection Form
	Annually and after a seismic event and heavy rain ⁽²⁾	Settlement Inspection Form
	Annually and after a seismic event and heavy rain ⁽²⁾	Reinforced Earthen Slope Inspection Form
Gas Collection and Treatment System	Annually and after a seismic event and heavy rain ⁽²⁾	Gas Vent System Inspection Form
Surface Water Drainage System	Annually and after a seismic event and heavy rain ⁽²⁾	Surface Water Drainage Inspection Form
Subsurface Drainage System	Annually and after a seismic event and heavy rain ⁽²⁾	Subsurface Drainage Inspection Form
Groundwater Monitoring System	Before each sampling event	Groundwater Monitoring Well Inspection Form
Perimeter Fence	Annually and after a seismic event and heavy rain ⁽²⁾	Security Fence Inspection Form
Access Roads	Annually and after a seismic event and heavy rain ⁽²⁾	Access Road Inspection Form
Surveys:		
Pre-Monument Survey Inspection	Prior to each scheduled monument survey	None
Monument Survey	Annually for first five years of operation and than once every five years after the first five years of operation ⁽³⁾	Monument Survey Record
Monitoring:		
Groundwater Monitoring System	Semi-annually: Water Level Measurement (all twenty MW)	Groundwater Elevations Form and Purge/Sampling Log Form
	Bi-annually: Sampling for COCs (MW:P-5I, P-5L, P-9D, P-5D, W-9B, W-9C, and W-10B)	
	Annually: Sampling for COCs (MW: P-2I, P-10D, P-10L, and P-10XD)	
GCTS: Flow Indicator	Bi-weekly	Gas Collection and Treatment System Monitoring Form
GCTS: Carbon Adsorber Exhaust	Bi-weekly	Gas Collection and Treatment System Monitoring Form
GCTS: Gas Collection Pressure Probes	Semi-annually and after a seismic event	Gas Perimeter Monitoring Form

⁽¹⁾ Conducted by LCX employees with access to the Site.

⁽²⁾ Defined as precipitation events with intensity exceeding 4.69 inches over a 24-hour period, which coincides with a 25-year, 24-hour event.

⁽³⁾ Next scheduled monument survey event to be conducted in the year 2007.



McColl Superfund Site

SOURCE: LENSKA Aerial Image - photo date 1-2002



**FIGURE 1.0
SITE LOCATION MAP
MCCOLL SUPERFUND SITE**

DATE: 09-23-03	PROJECT NO: 02-110	REV: 01
----------------	--------------------	---------



C2 REM

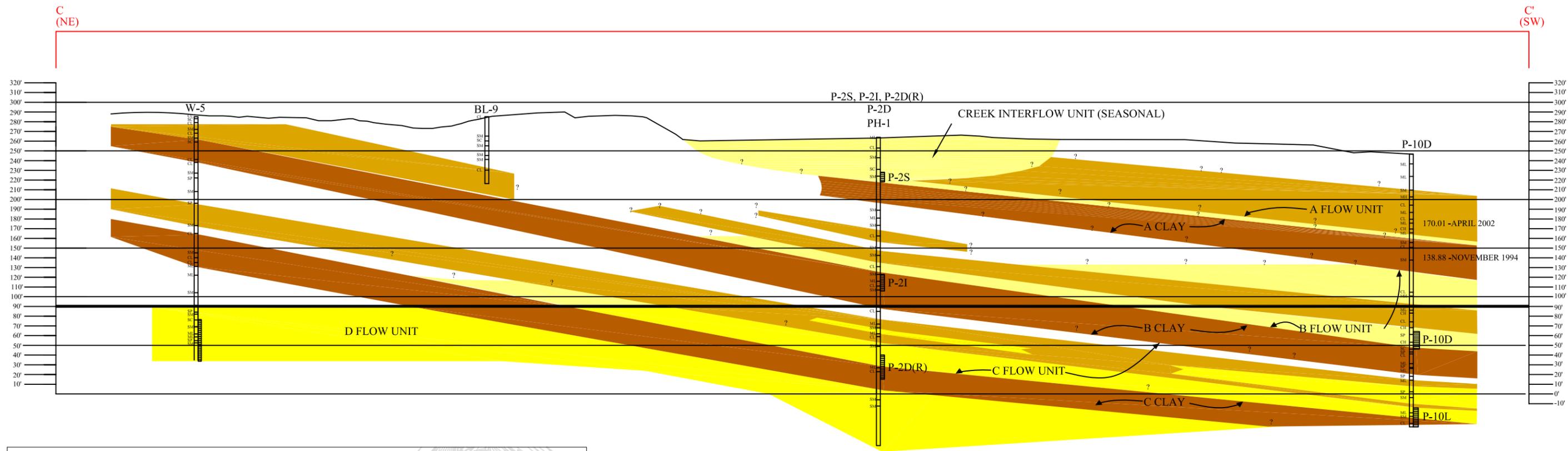
**AN ENVIRONMENTAL MANAGEMENT
ENGINEERING AND DEVELOPMENT COMPANY**
NEWPORT BEACH, CALIFORNIA 949.261.8096



SOURCE: LENSKA Aerial Image - photo date 1-2002

- Ramparts Parcels
- Los Coyotes Parcels

FIGURE 2.0		
SUMP LOCATION MAP		
McCOLL SUPERFUND SITE		
DATE: 09-23-03	PROJECT NO: 02-110	REV: 01
C2 REM AN ENVIRONMENTAL MANAGEMENT ENGINEERING AND DEVELOPMENT COMPANY NEWPORT BEACH, CALIFORNIA 949.261.8098		

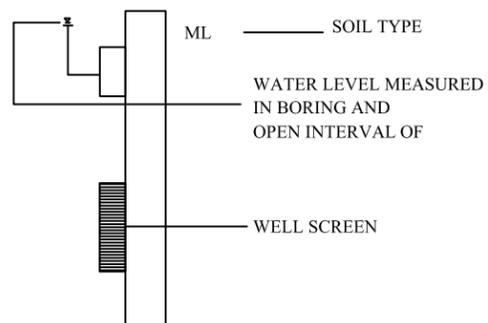


REFERENCE: FINAL REMEDIAL INVESTIGATION REPORT GROUNDWATER OPERABLE UNIT, ENVIRON, DECEMBER 1995

EXPLANATION

- VARIABLY SATURATED SILTY SANDS TO SANDS
- FULLY SATURATED SILTY SANDS TO SANDY GRAVELS
- INTERBEDDED SILTS AND CLAYS WITHIN A FLOW UNIT
- BASAL CLAY TO AN OVERLYING FLOW UNIT
- SCHEMATIC OF UPPER BOUNDARY OF FULLY SATURATED ZONE

BORING LOG/WELL INSTALLATION



NOTES:

1. SEE CROSS SECTION LOCATION MAP FOR ORIENTATION OF CROSS SECTIONS.
2. DATA FROM MULTIPLE BORINGS SHOWN TOGETHER FOR CLARITY.
3. SOILS ARE CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS).
4. ELEVATIONS SHOWN HERE ARE BASED ON SURVEYS AVAILABLE AT THE TIME THE CROSS SECTIONS WERE DEVELOPED AND MAY DEVIATE SLIGHTLY.

FIGURE 3.0
Schematic Geologic Cross Section C-C'
McColl Superfund Site

DATE: 11.05.03	PROJECT NO: 02-110	REV: 01
-----------------------	---------------------------	----------------

C2 REM
AN ENVIRONMENTAL MANAGEMENT
ENGINEERING AND DEVELOPMENT COMPANY
NEWPORT BEACH, CALIFORNIA 949.261.8096

**Figure 4.0
Carbon Bed Changeout Protocol
McCull Superfund Site**

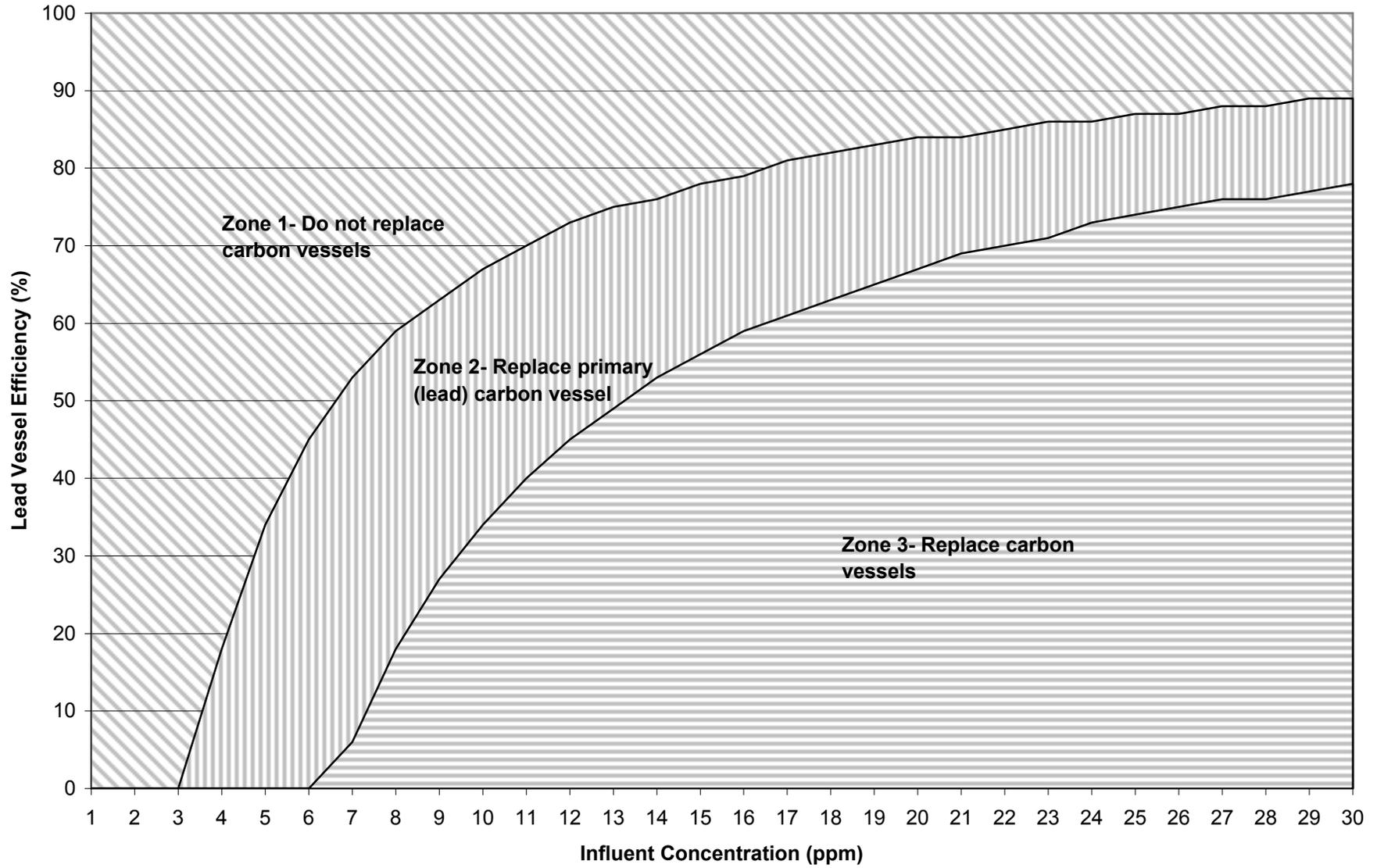


FIGURE 5.0
C2 REM V-DITCH REPAIR
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA



A) Damaged section of Vee ditch along lower Rampart adjacent to the catch basin and to the east (1-30-03).



B) Damaged section of Vee ditch along Los Coyotes parcel adjacent to a golf course green (1-30-03).



C) Placement and packing of base material (3-4-03).



D) Placement of welded wire mesh (3-4-03).

FIGURE 6.0
C2 REM V-DITCH REPAIR
McCOLL SUPERFUND SITE
FULLERTON, CALIFORNIA



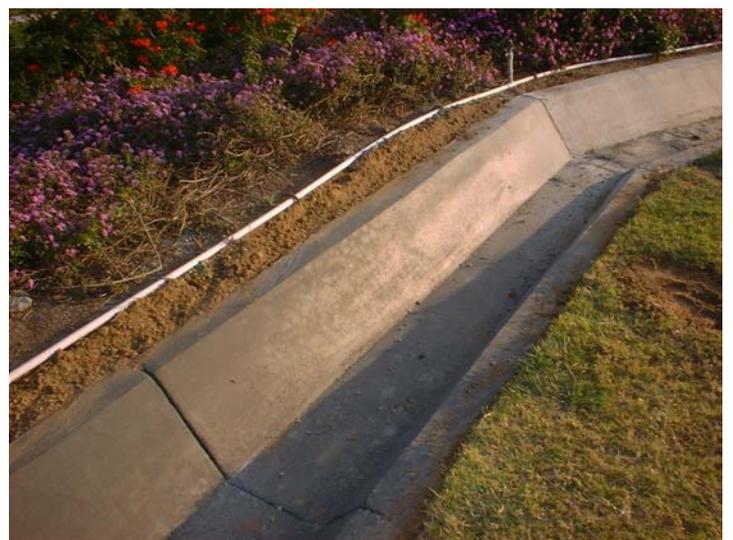
E) Placement of welded wire mesh (3-6-03).



F) Placement of forms (3-6-03).



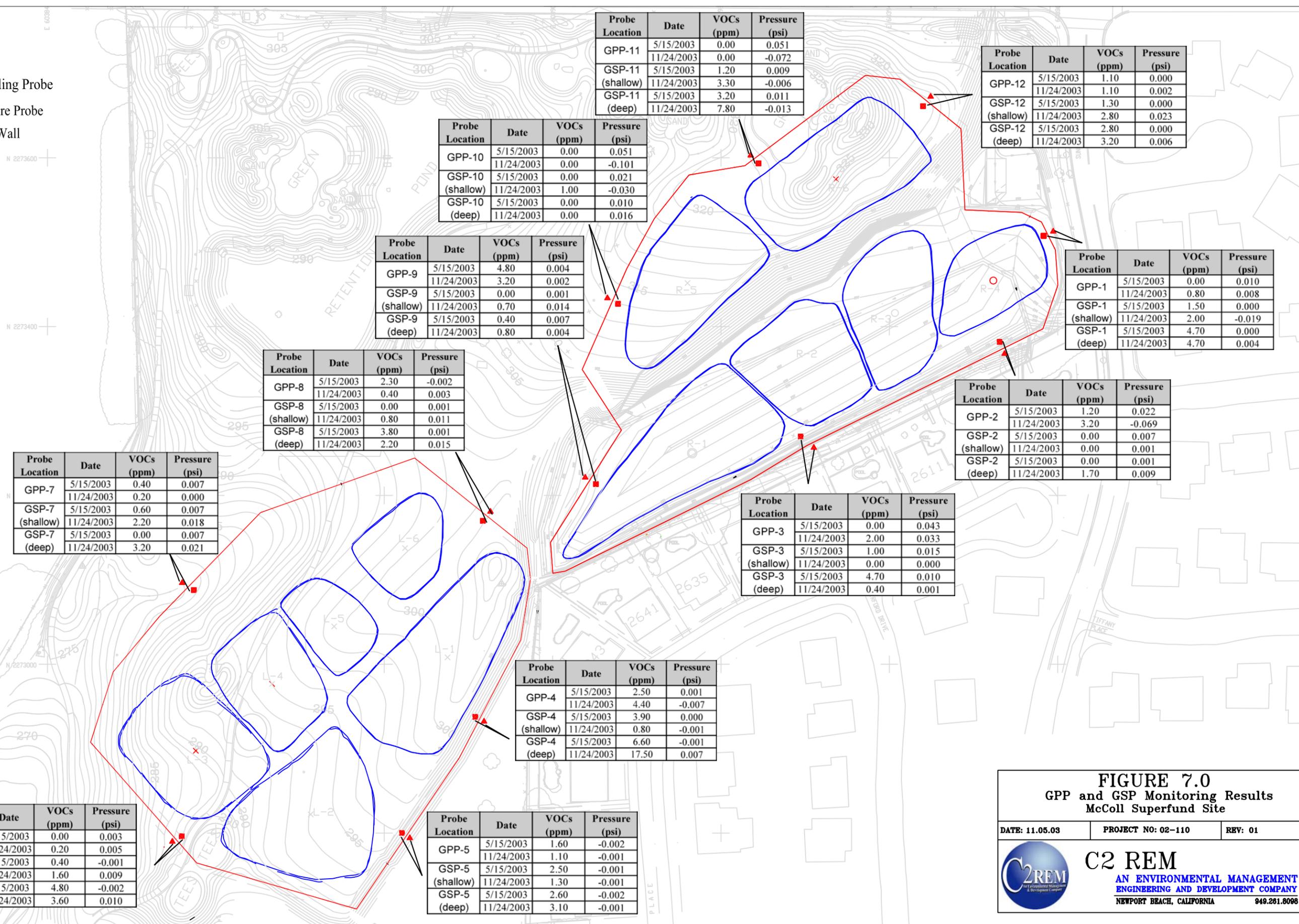
G) Repaired section of Vee ditch along Rampart Parcel (3-7-03).



H) Repaired section of Vee ditch along Los Coyotes parcel (3-7-03).

LEGEND:

- ▲ GSP- Gas Sampling Probe
- GPP - Gas Pressure Probe
- Extent of Slurry Wall
- Extent of Sumps



Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-11	5/15/2003	0.00	0.051
	11/24/2003	0.00	-0.072
GSP-11 (shallow)	5/15/2003	1.20	0.009
	11/24/2003	3.30	-0.006
GSP-11 (deep)	5/15/2003	3.20	0.011
	11/24/2003	7.80	-0.013

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-12	5/15/2003	1.10	0.000
	11/24/2003	1.10	0.002
GSP-12 (shallow)	5/15/2003	1.30	0.000
	11/24/2003	2.80	0.023
GSP-12 (deep)	5/15/2003	2.80	0.000
	11/24/2003	3.20	0.006

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-10	5/15/2003	0.00	0.051
	11/24/2003	0.00	-0.101
GSP-10 (shallow)	5/15/2003	0.00	0.021
	11/24/2003	1.00	-0.030
GSP-10 (deep)	5/15/2003	0.00	0.010
	11/24/2003	0.00	0.016

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-1	5/15/2003	0.00	0.010
	11/24/2003	0.80	0.008
GSP-1 (shallow)	5/15/2003	1.50	0.000
	11/24/2003	2.00	-0.019
GSP-1 (deep)	5/15/2003	4.70	0.000
	11/24/2003	4.70	0.004

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-9	5/15/2003	4.80	0.004
	11/24/2003	3.20	0.002
GSP-9 (shallow)	5/15/2003	0.00	0.001
	11/24/2003	0.70	0.014
GSP-9 (deep)	5/15/2003	0.40	0.007
	11/24/2003	0.80	0.004

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-2	5/15/2003	1.20	0.022
	11/24/2003	3.20	-0.069
GSP-2 (shallow)	5/15/2003	0.00	0.007
	11/24/2003	0.00	0.001
GSP-2 (deep)	5/15/2003	0.00	0.001
	11/24/2003	1.70	0.009

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-8	5/15/2003	2.30	-0.002
	11/24/2003	0.40	0.003
GSP-8 (shallow)	5/15/2003	0.00	0.001
	11/24/2003	0.80	0.011
GSP-8 (deep)	5/15/2003	3.80	0.001
	11/24/2003	2.20	0.015

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-3	5/15/2003	0.00	0.043
	11/24/2003	2.00	0.033
GSP-3 (shallow)	5/15/2003	1.00	0.015
	11/24/2003	0.00	0.000
GSP-3 (deep)	5/15/2003	4.70	0.010
	11/24/2003	0.40	0.001

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-7	5/15/2003	0.40	0.007
	11/24/2003	0.20	0.000
GSP-7 (shallow)	5/15/2003	0.60	0.007
	11/24/2003	2.20	0.018
GSP-7 (deep)	5/15/2003	0.00	0.007
	11/24/2003	3.20	0.021

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-4	5/15/2003	2.50	0.001
	11/24/2003	4.40	-0.007
GSP-4 (shallow)	5/15/2003	3.90	0.000
	11/24/2003	0.80	-0.001
GSP-4 (deep)	5/15/2003	6.60	-0.001
	11/24/2003	17.50	0.007

Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-6	5/15/2003	0.00	0.003
	11/24/2003	0.20	0.005
GSP-6 (shallow)	5/15/2003	0.40	-0.001
	11/24/2003	1.60	0.009
GSP-6 (deep)	5/15/2003	4.80	-0.002
	11/24/2003	3.60	0.010

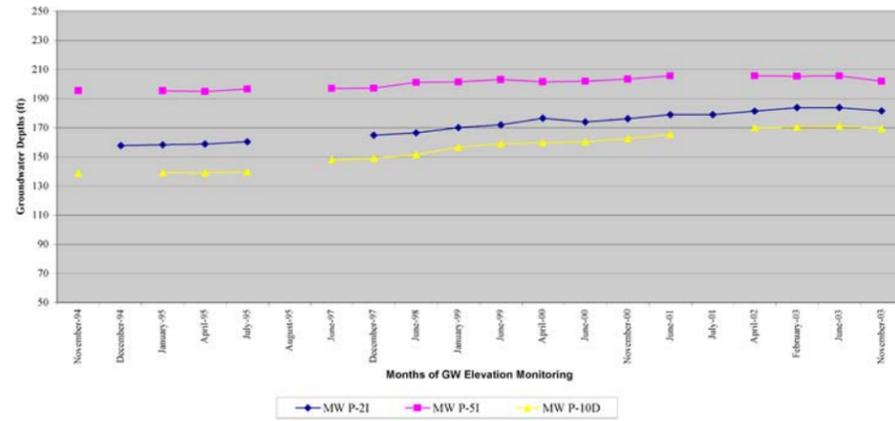
Probe Location	Date	VOCs (ppm)	Pressure (psi)
GPP-5	5/15/2003	1.60	-0.002
	11/24/2003	1.10	-0.001
GSP-5 (shallow)	5/15/2003	2.50	-0.001
	11/24/2003	1.30	-0.001
GSP-5 (deep)	5/15/2003	2.60	-0.002
	11/24/2003	3.10	-0.001

FIGURE 7.0
GPP and GSP Monitoring Results
McColl Superfund Site

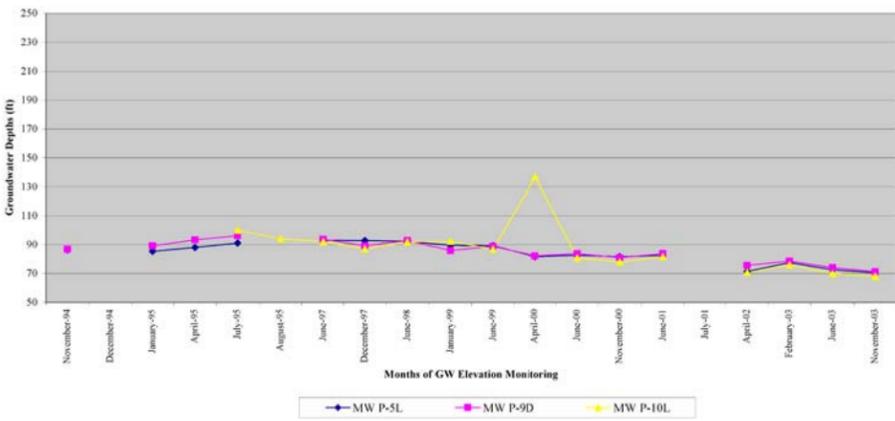
DATE: 11.05.03	PROJECT NO: 02-110	REV: 01
----------------	--------------------	---------

C2 REM
AN ENVIRONMENTAL MANAGEMENT
ENGINEERING AND DEVELOPMENT COMPANY
NEWPORT BEACH, CALIFORNIA 949.261.8096

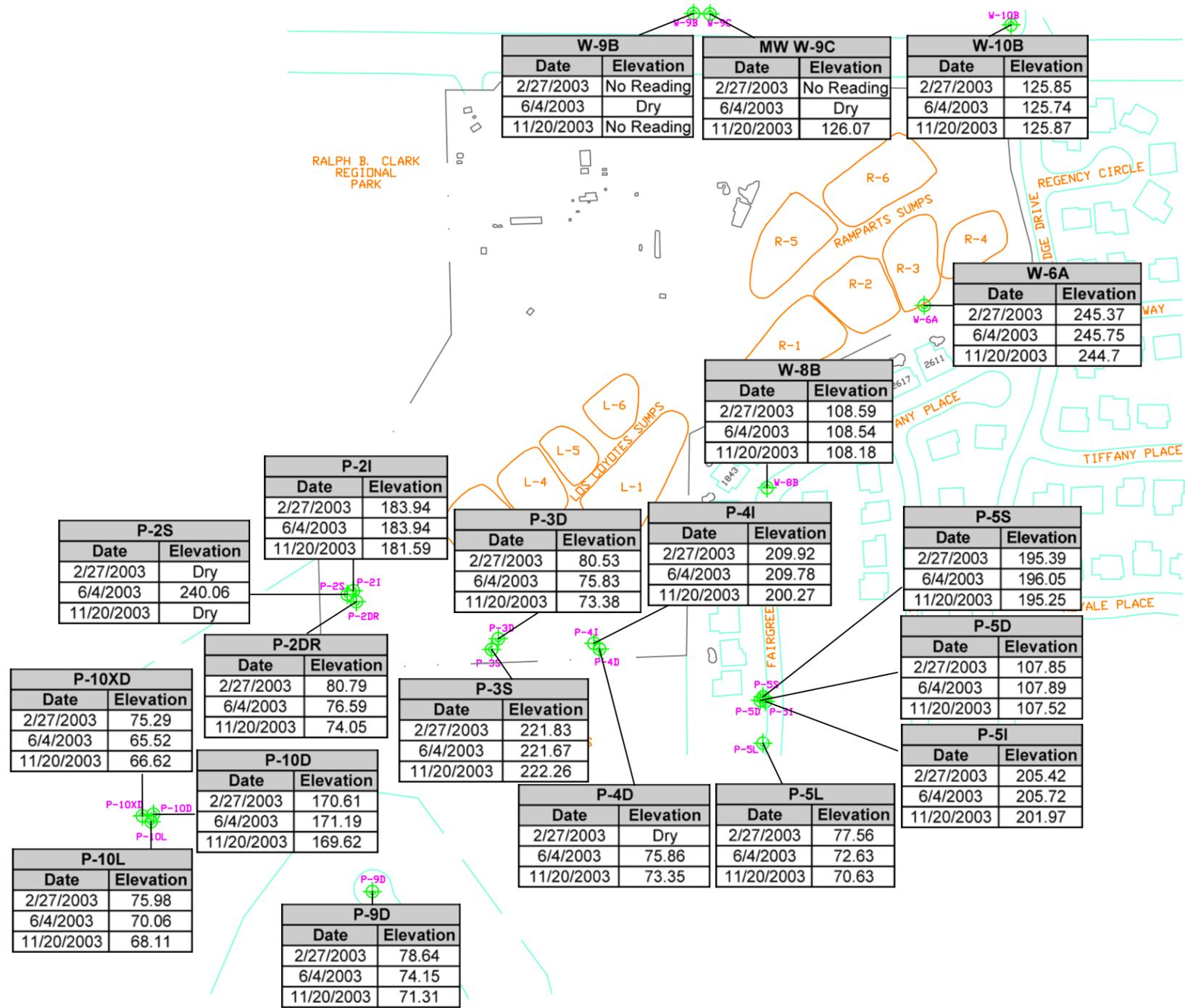
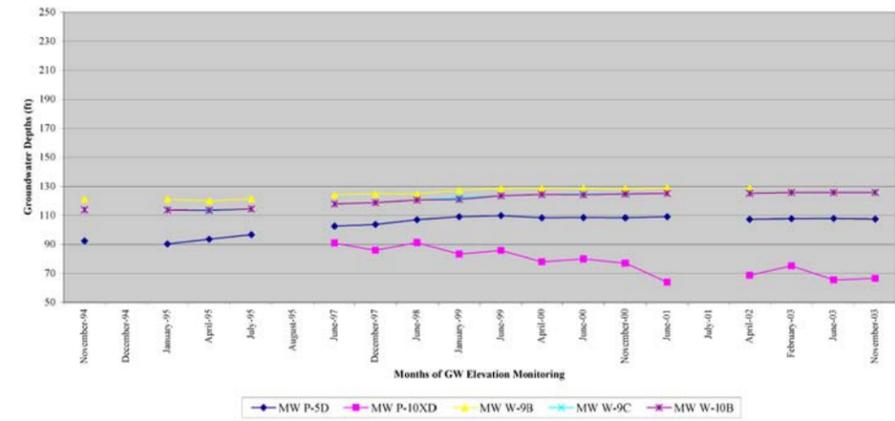
**Stacked B-Zone Groundwater Elevations
McColl Superfund Site
Fullerton, California**



**Stacked C-Zone Groundwater Elevations
McColl Superfund Site
Fullerton, California**



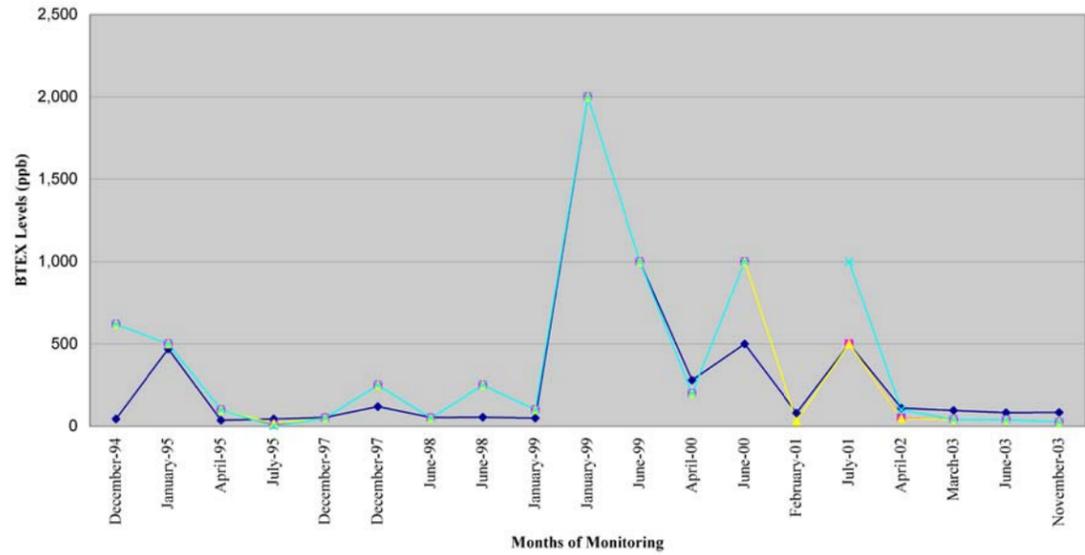
**Stacked D-Zone Groundwater Elevations
McColl Superfund Site
Fullerton, California**



**FIGURE 8.0
Groundwater Elevation Map
McColl Superfund Site**

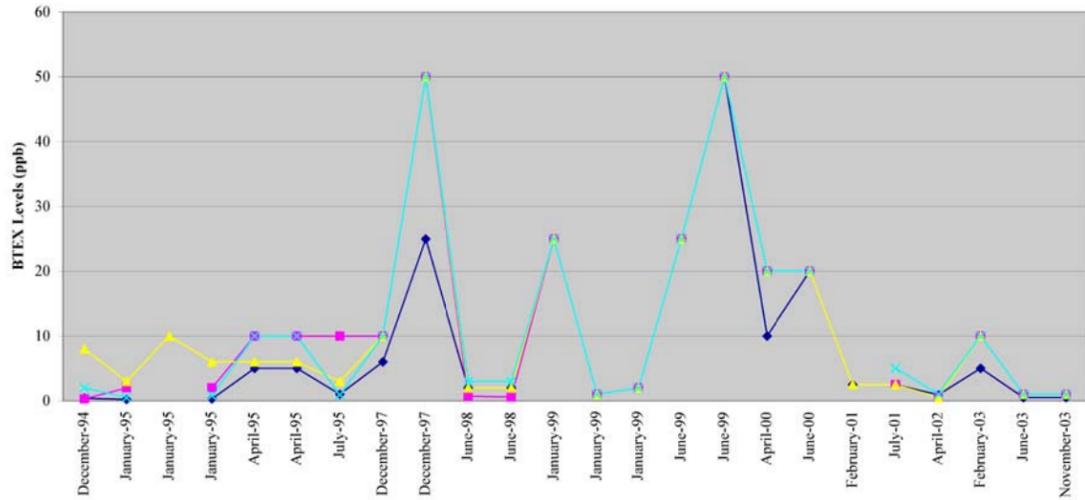
DATE: 01.19.04 PROJECT NO: 02-110 REV: 01

C2 REM
AN ENVIRONMENTAL MANAGEMENT
ENGINEERING AND DEVELOPMENT COMPANY
NEWPORT BEACH, CALIFORNIA 949.261.8098



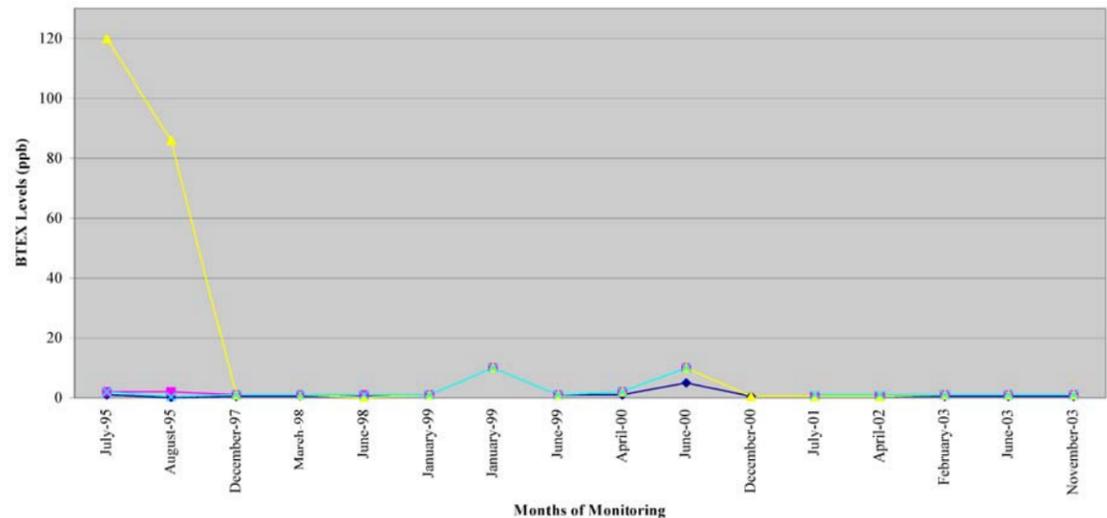
Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)



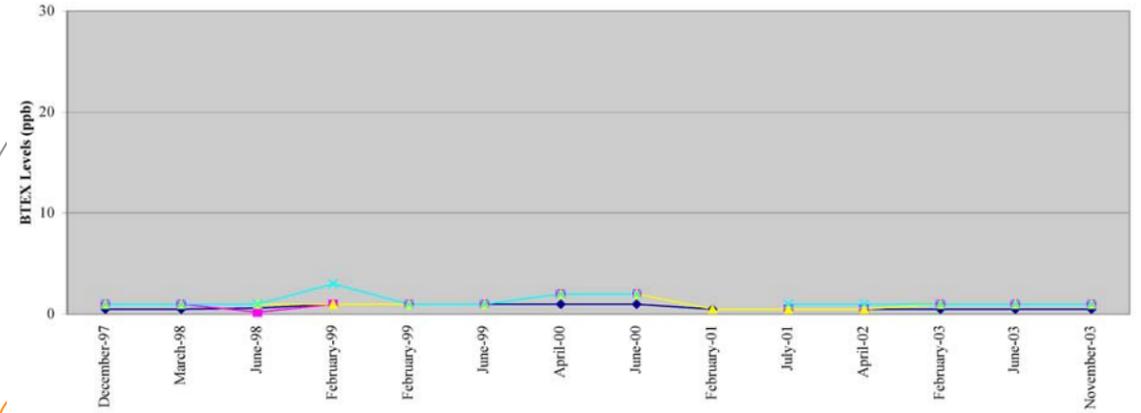
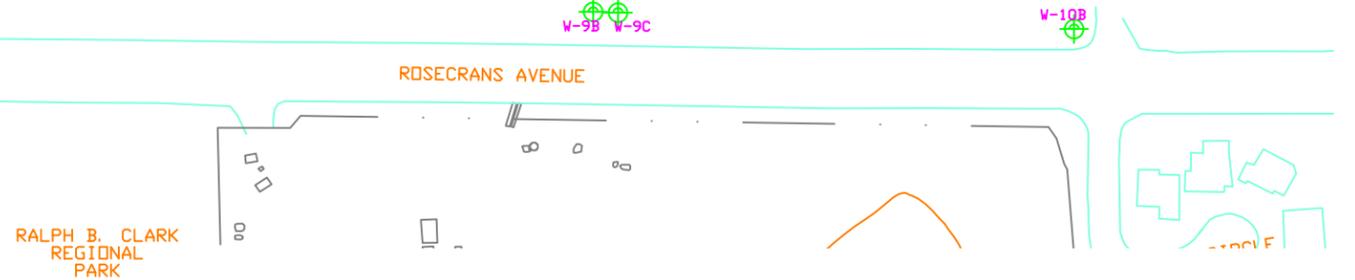
Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)



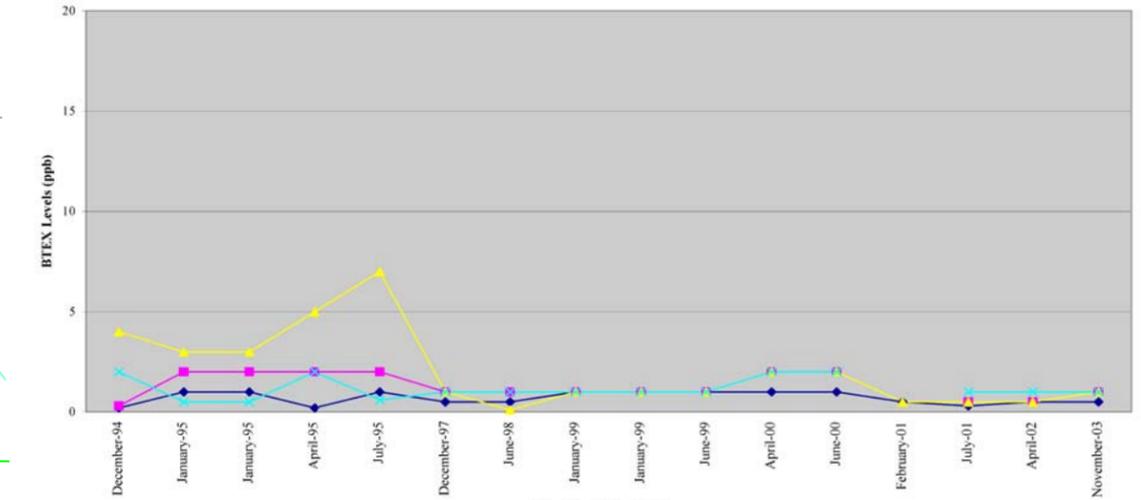
Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)



Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)



Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)

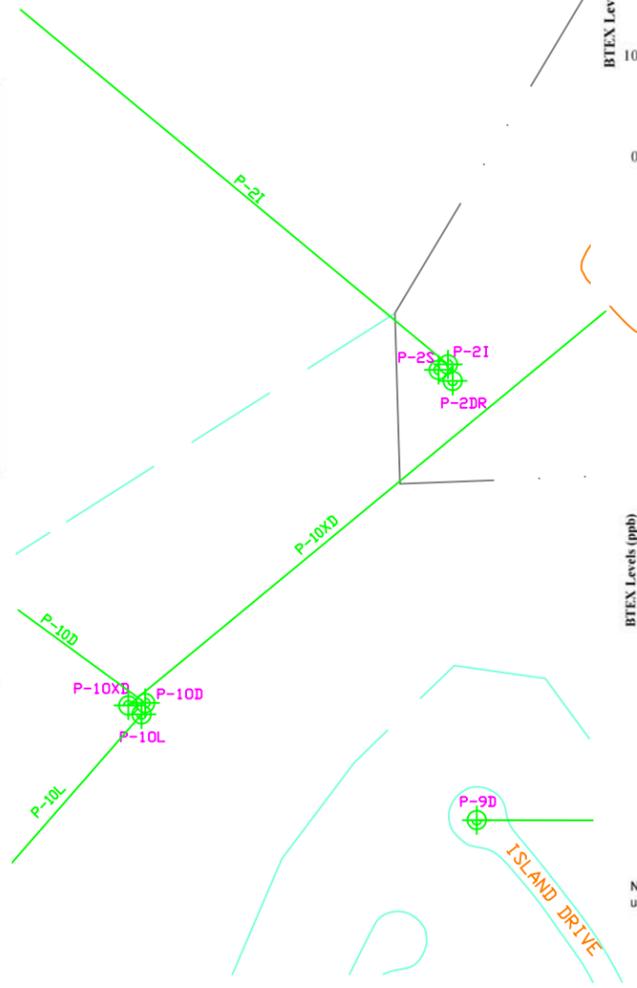
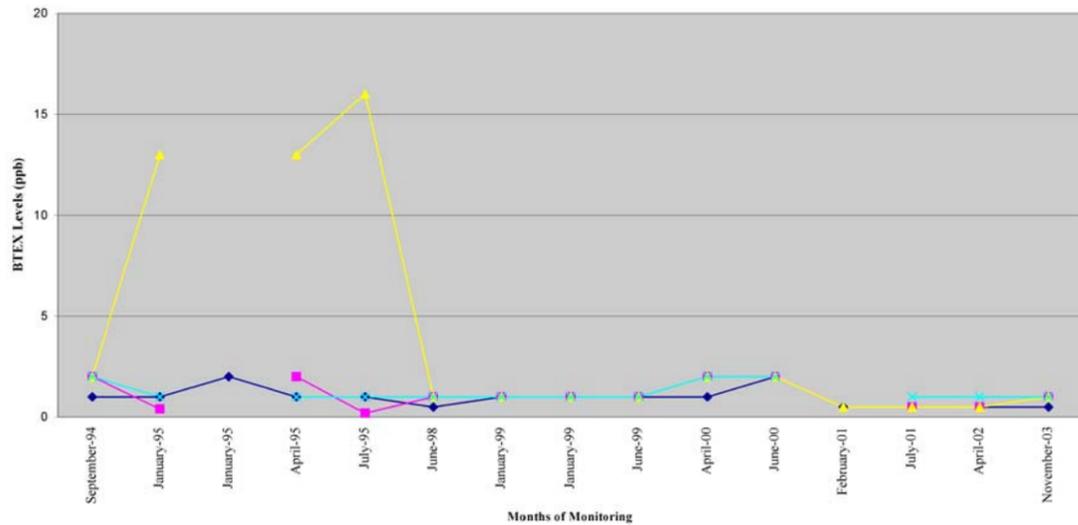


FIGURE 9.0
BTEX Laboratory Results
 Wells P-2I, P-10XD, P-10D, P-10L, P-9D
 McColl Superfund Site

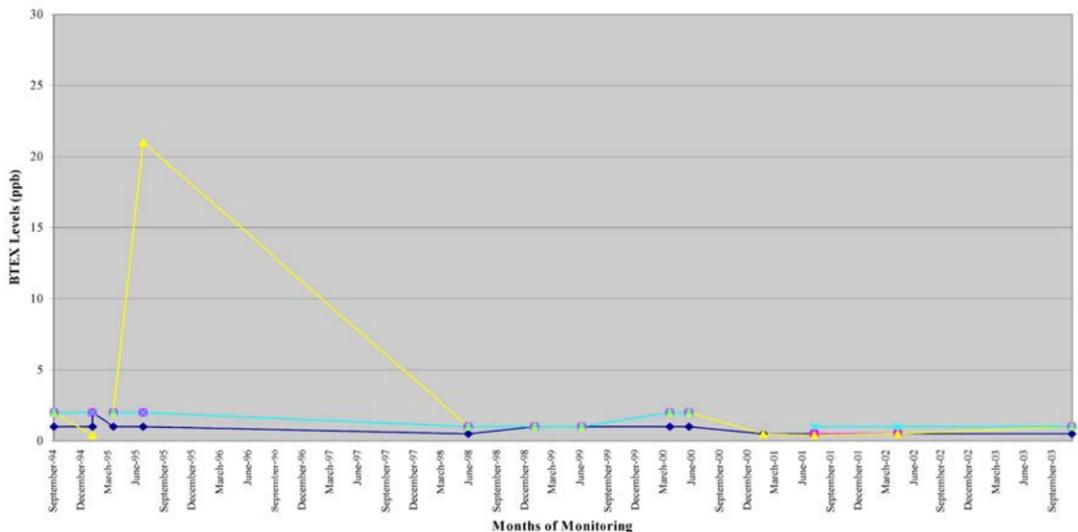
DATE: 11.05.03	PROJECT NO: 02-110	REV: 01
----------------	--------------------	---------


C2 REM
 AN ENVIRONMENTAL MANAGEMENT
 ENGINEERING AND DEVELOPMENT COMPANY
 NEWPORT BEACH, CALIFORNIA 949.261.8098



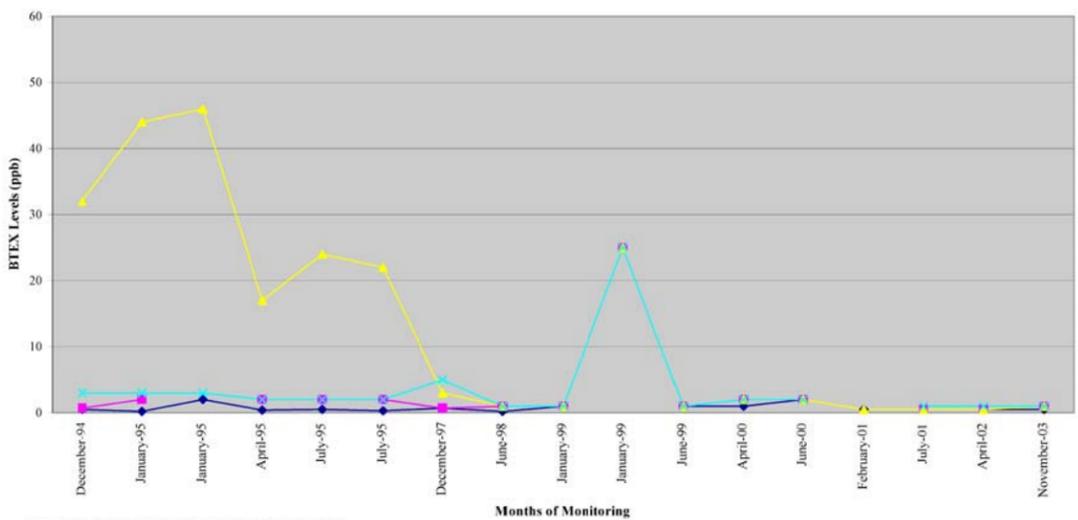
Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)



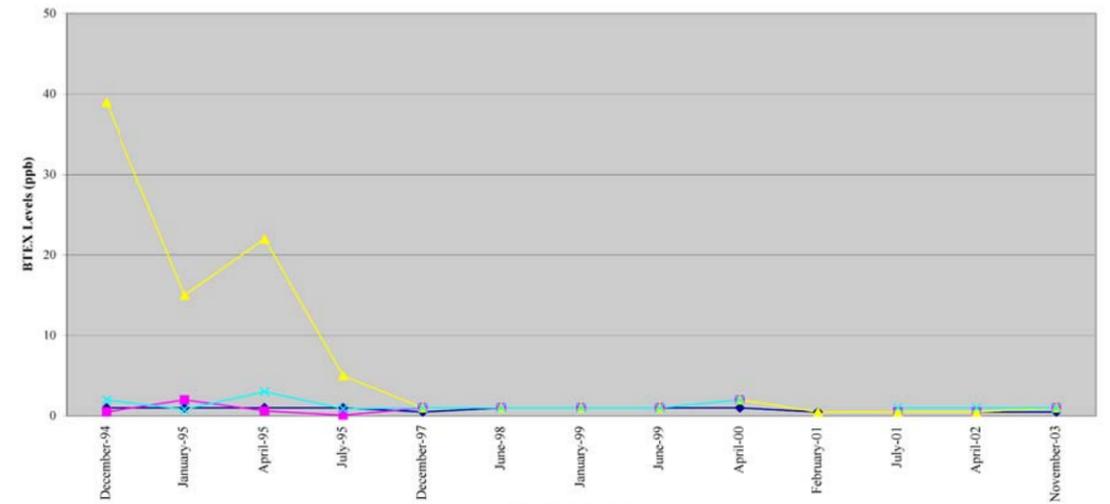
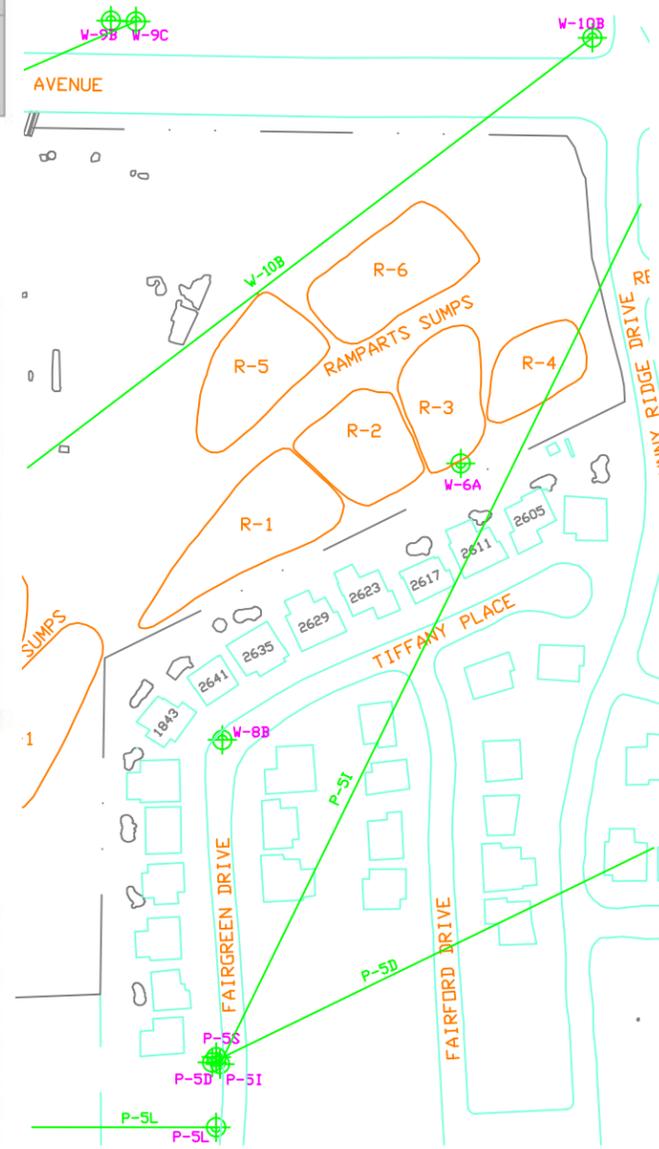
Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)



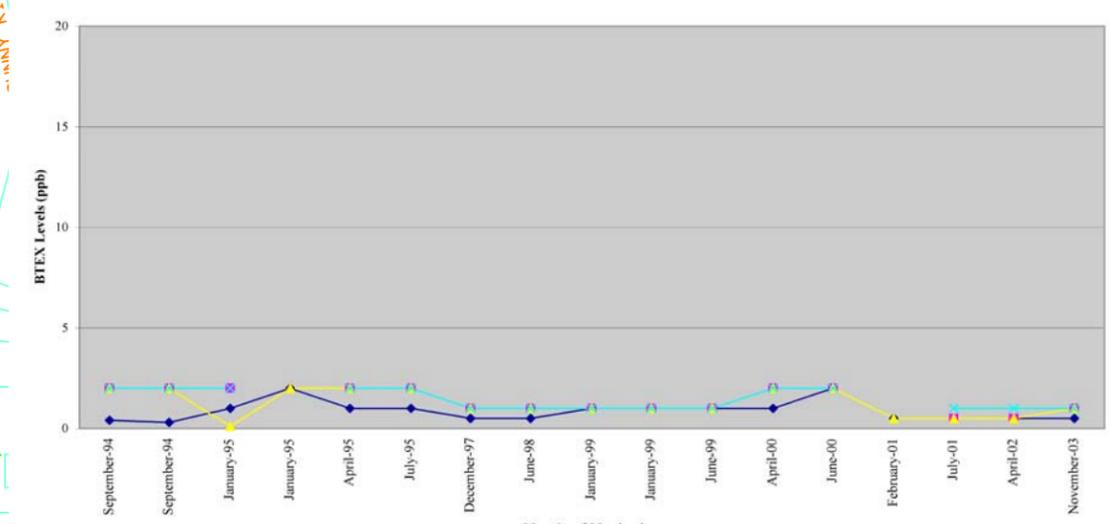
Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)



Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)



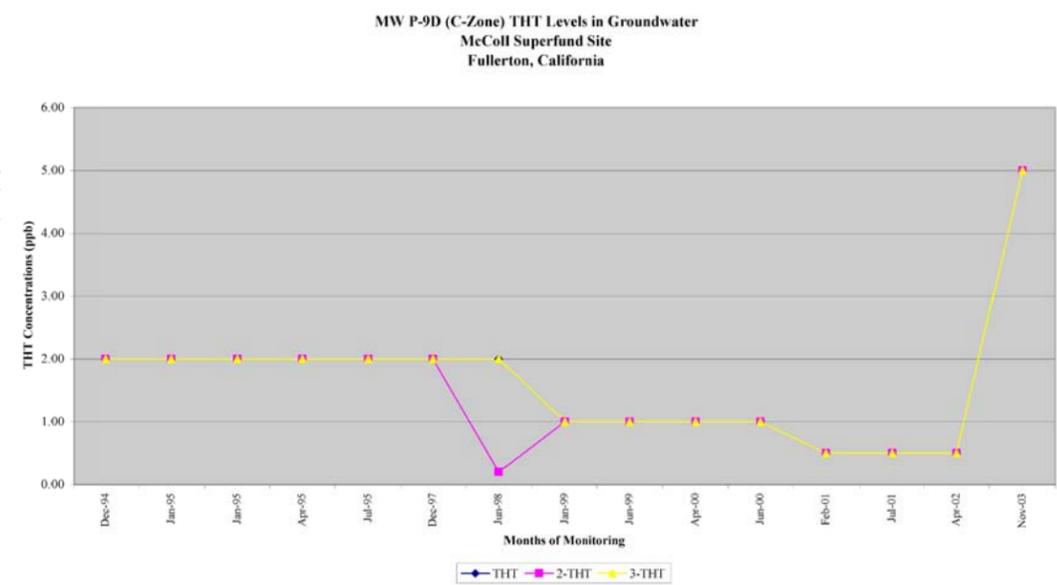
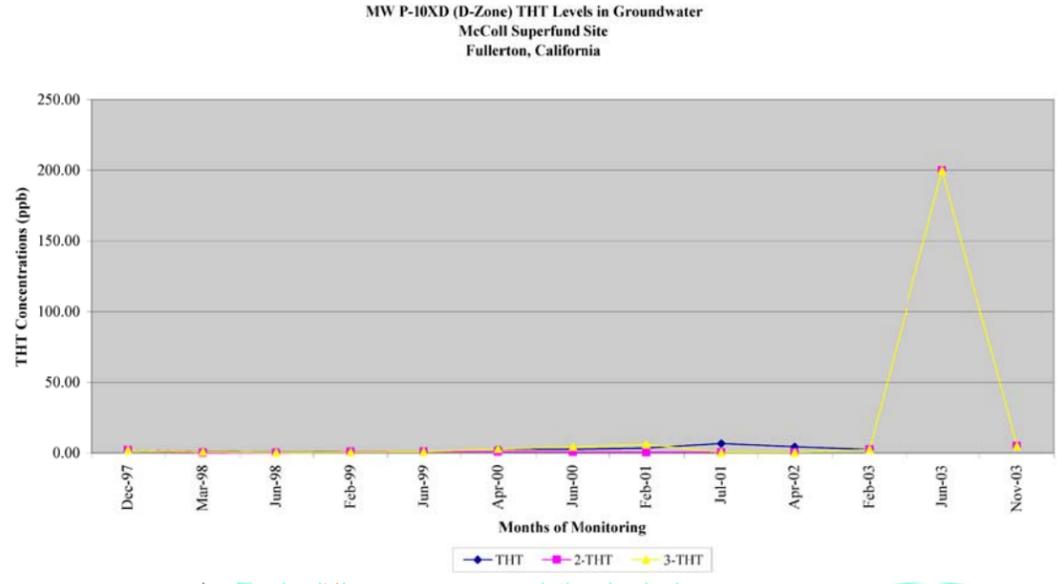
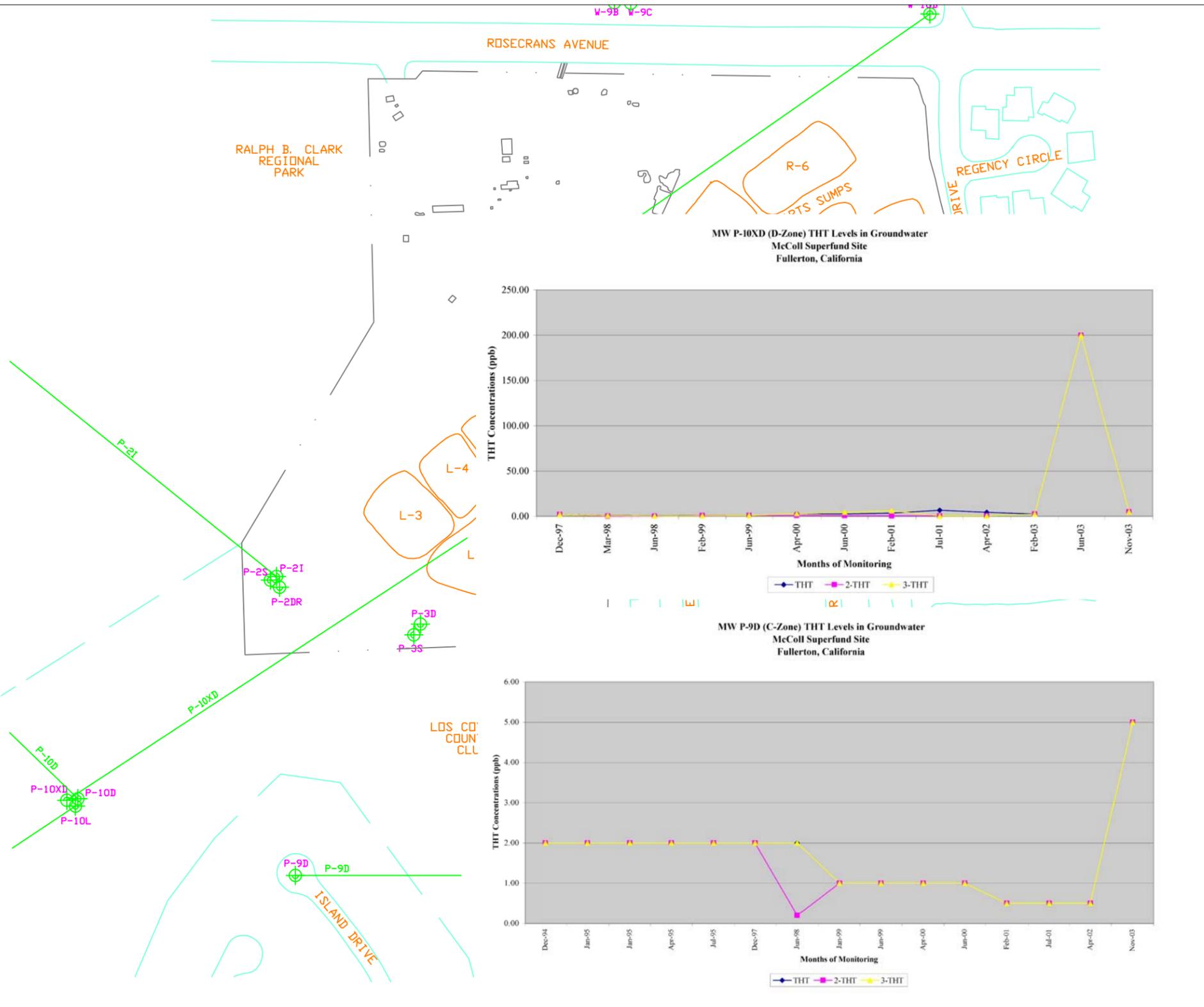
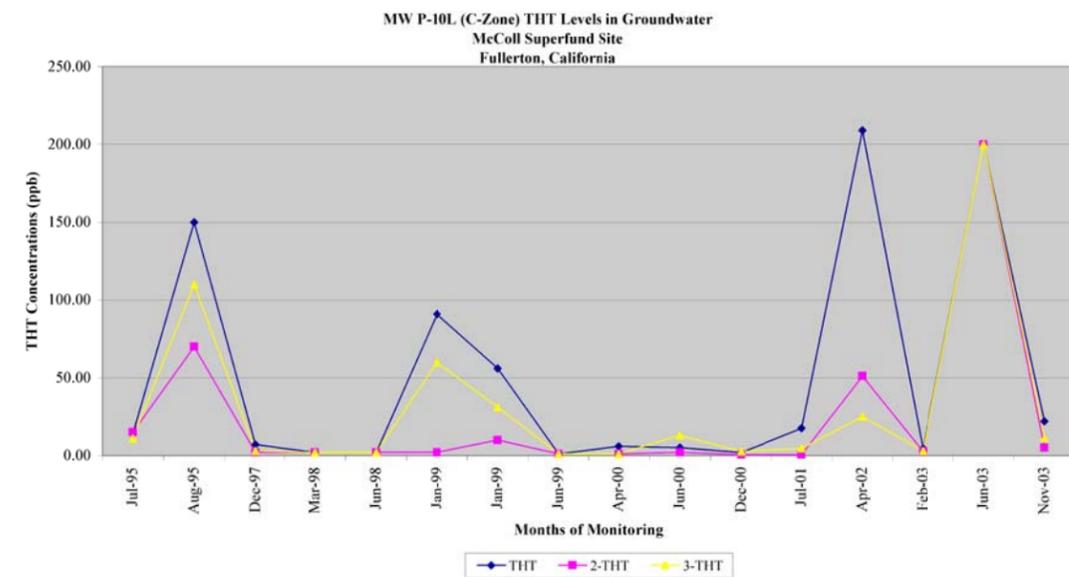
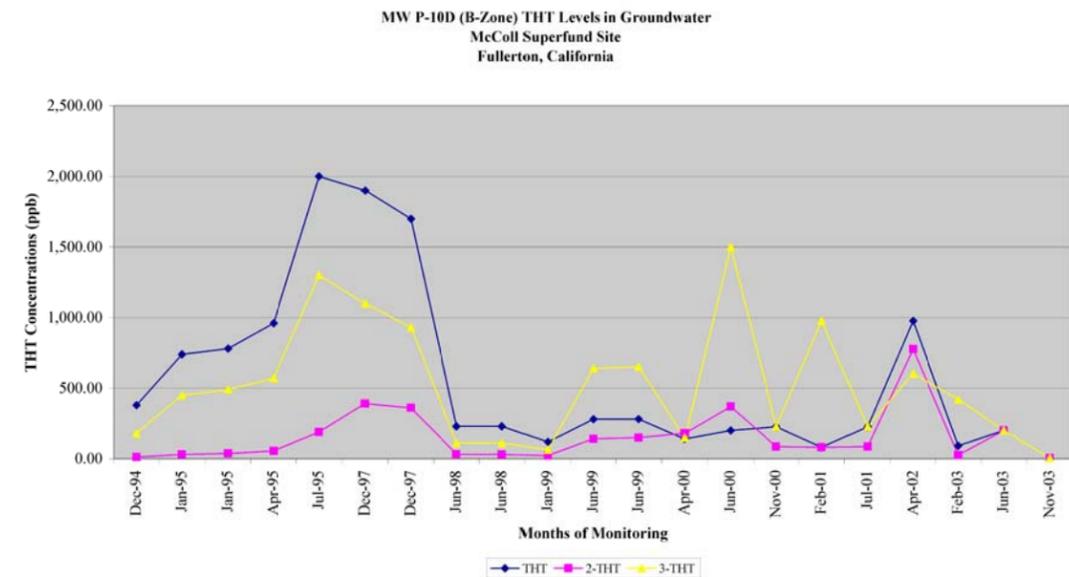
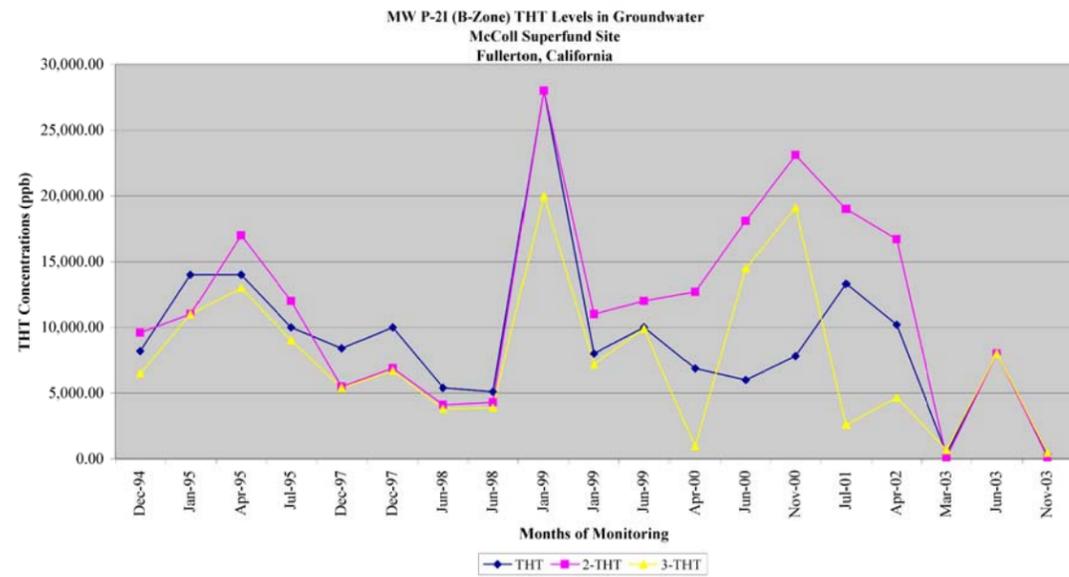
Note: For graphical purposes, the reporting limits were used for non detect (ND) sample results.

Legend: Benzene (blue diamond), Ethylbenzene (magenta square), Toluene (yellow triangle), Xylene (cyan asterisk)

FIGURE 10.0
BTEX Laboratory Results
 Wells P-5I, P-5D, P-5L, W-9C, W-10B
 McColl Superfund Site

DATE: 11.05.03	PROJECT NO: 02-110	REV: 01
----------------	--------------------	---------


C2 REM
 AN ENVIRONMENTAL MANAGEMENT
 ENGINEERING AND DEVELOPMENT COMPANY
 NEWPORT BEACH, CALIFORNIA 949.261.8096



Notes:

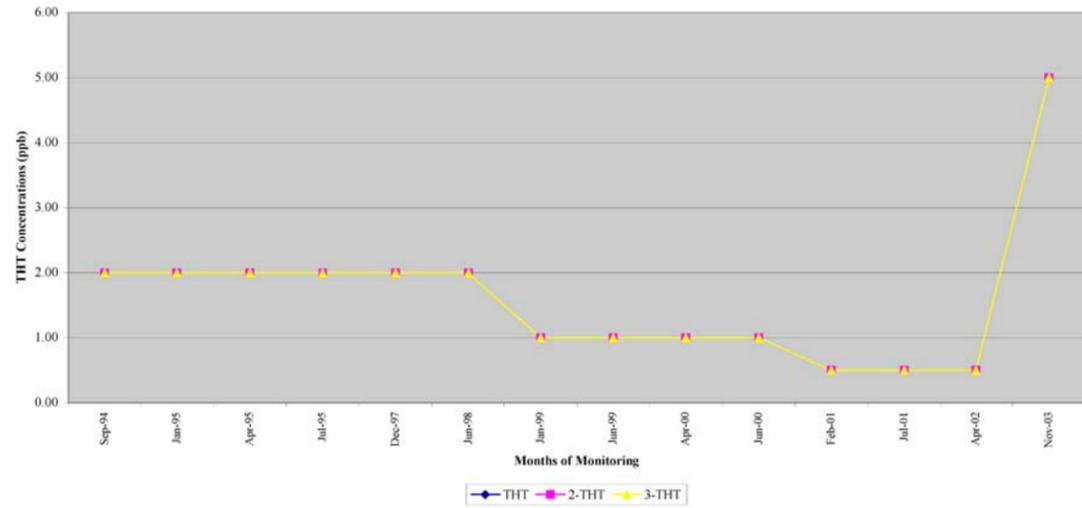
- 1) For graphical purposes, the reporting limits were used for non detect (ND) sample results.
- 2) During the June and November 2003 sampling event, higher than anticipated reporting limits were utilized for some samples (see Appendix F for laboratory results).

FIGURE 11.0
THT Laboratory Results
Wells P-21, P-10XD, P-10D, P-10L, P-9D
McColl Superfund Site

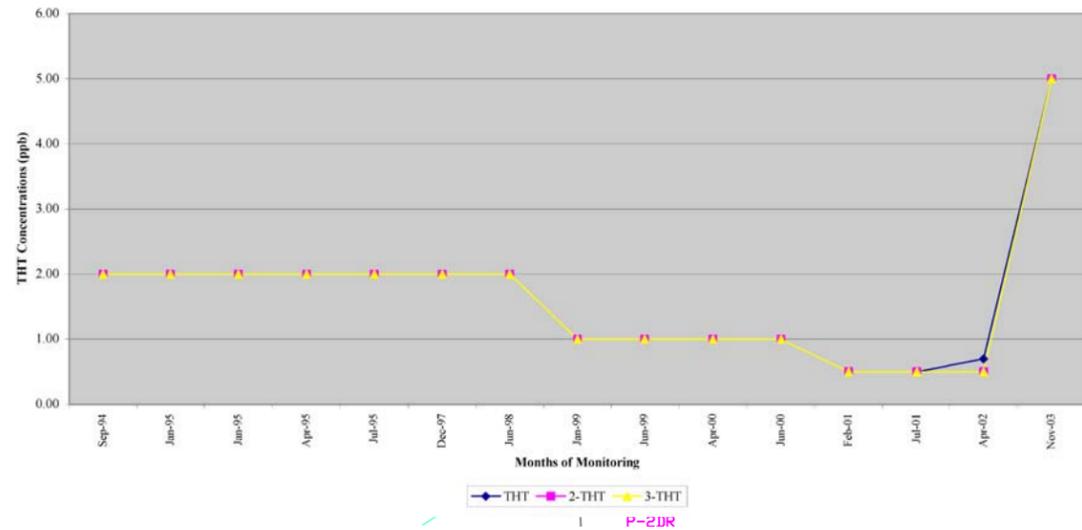
DATE: 11.05.03	PROJECT NO: 02-110	REV: 01
----------------	--------------------	---------

C2 REM
AN ENVIRONMENTAL MANAGEMENT
ENGINEERING AND DEVELOPMENT COMPANY
NEWPORT BEACH, CALIFORNIA 949.261.8098

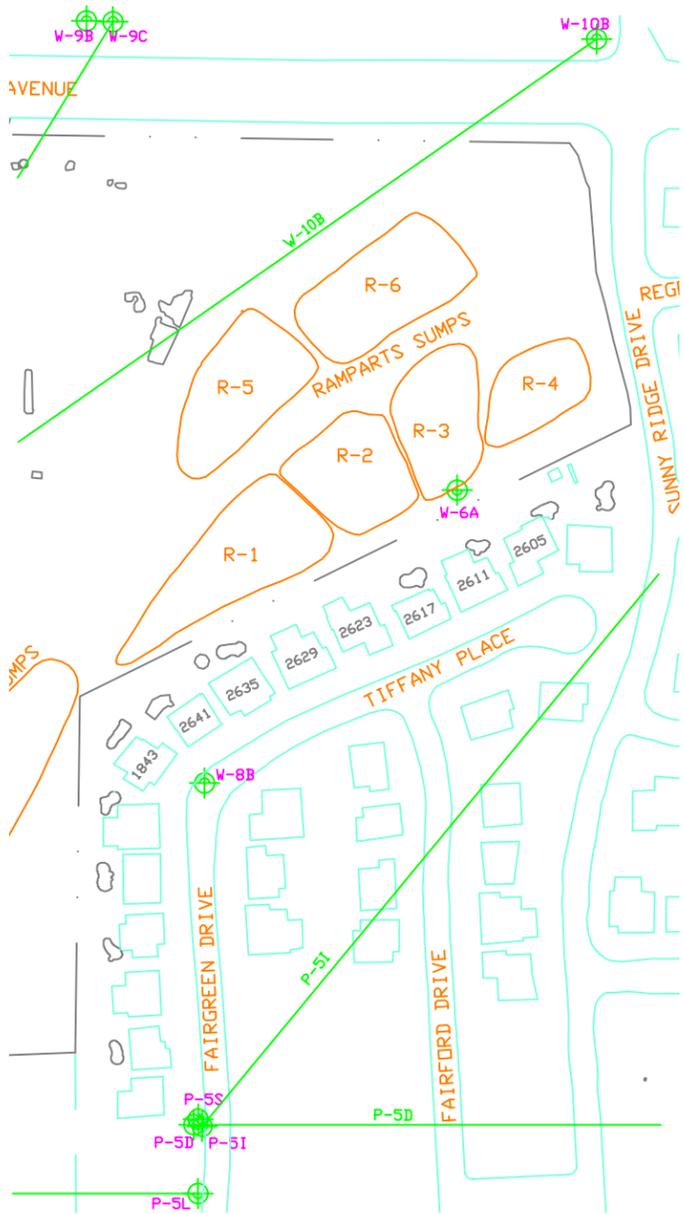
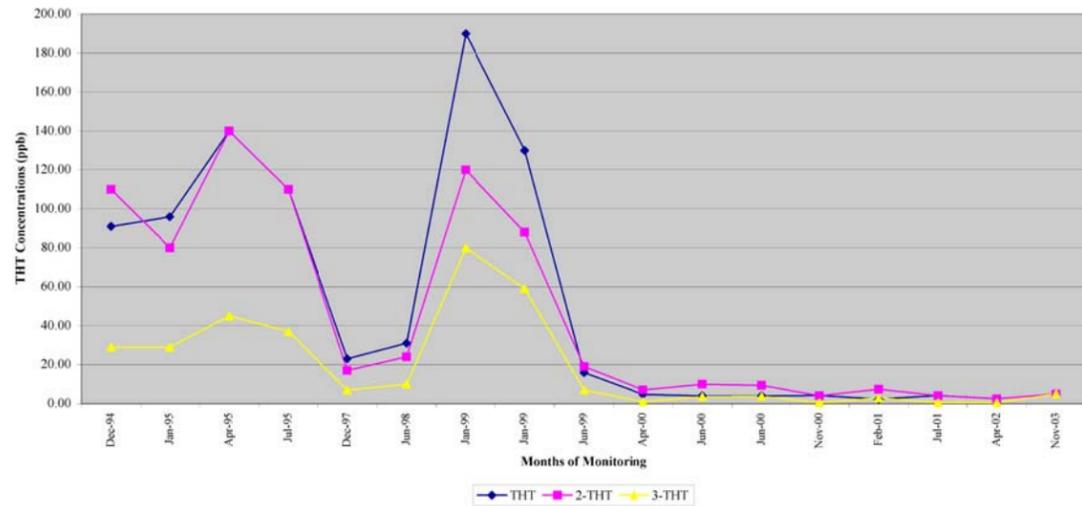
MW W-9C (D-Zone) THT Levels in Groundwater
 McColl Superfund Site
 Fullerton, California



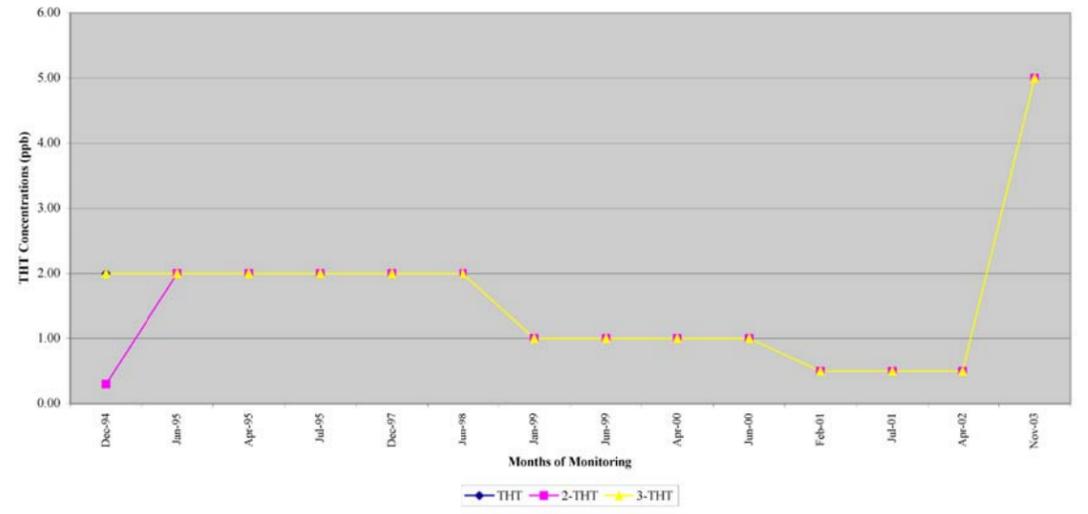
MW W-10B (D-Zone) THT Levels in Groundwater
 McColl Superfund Site
 Fullerton, California



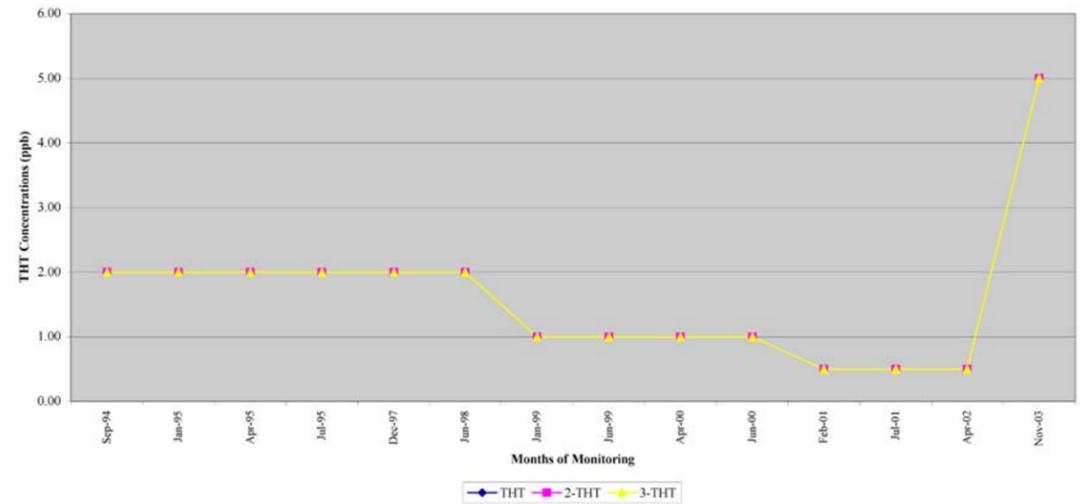
MW P-5L (C-Zone) THT Levels in Groundwater
 McColl Superfund Site
 Fullerton, California



MW P-5I (B-Zone) THT Levels in Groundwater
 McColl Superfund Site
 Fullerton, California



MW P-5D (D-Zone) THT Levels in Groundwater
 McColl Superfund Site
 Fullerton, California



Notes:

- 1) For graphical purposes, the reporting limits were used for non detect (ND) sample results.
- 2) During the November 2003 sampling event, higher than anticipated reporting limits were utilized for some samples (see Appendix F for laboratory results).

FIGURE 12.0
 THT Laboratory Results
 Wells P-5I, P-5D, P-5L, W-9C, W-10B
 McColl Superfund Site

DATE: 11.05.03	PROJECT NO: 02-110	REV: 01
----------------	--------------------	---------


C2 REM
 AN ENVIRONMENTAL MANAGEMENT
 ENGINEERING AND DEVELOPMENT COMPANY
 NEWPORT BEACH, CALIFORNIA 949.261.8096

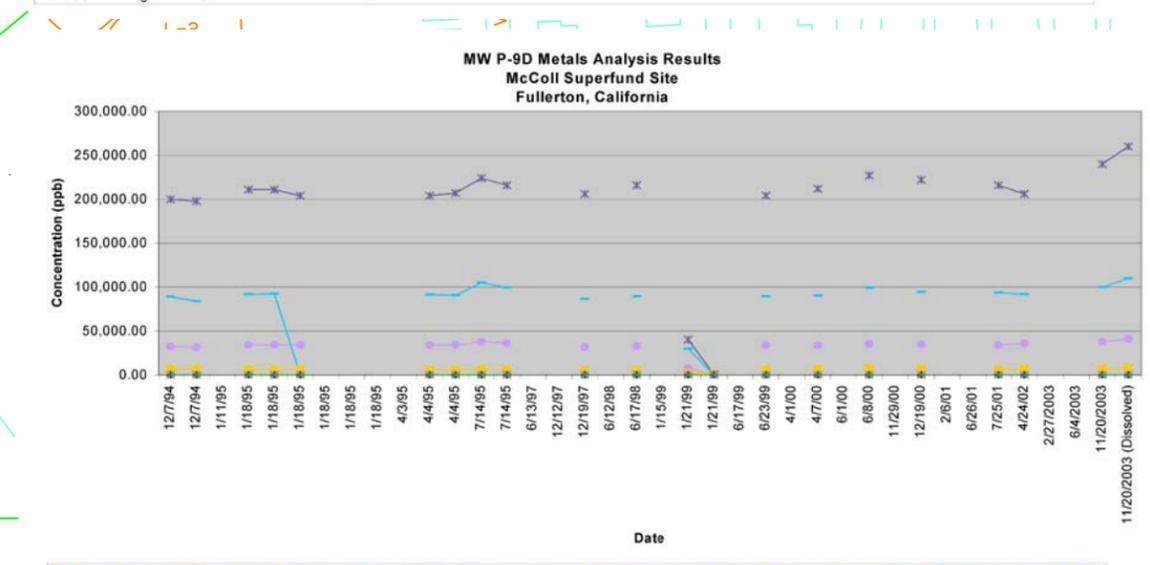
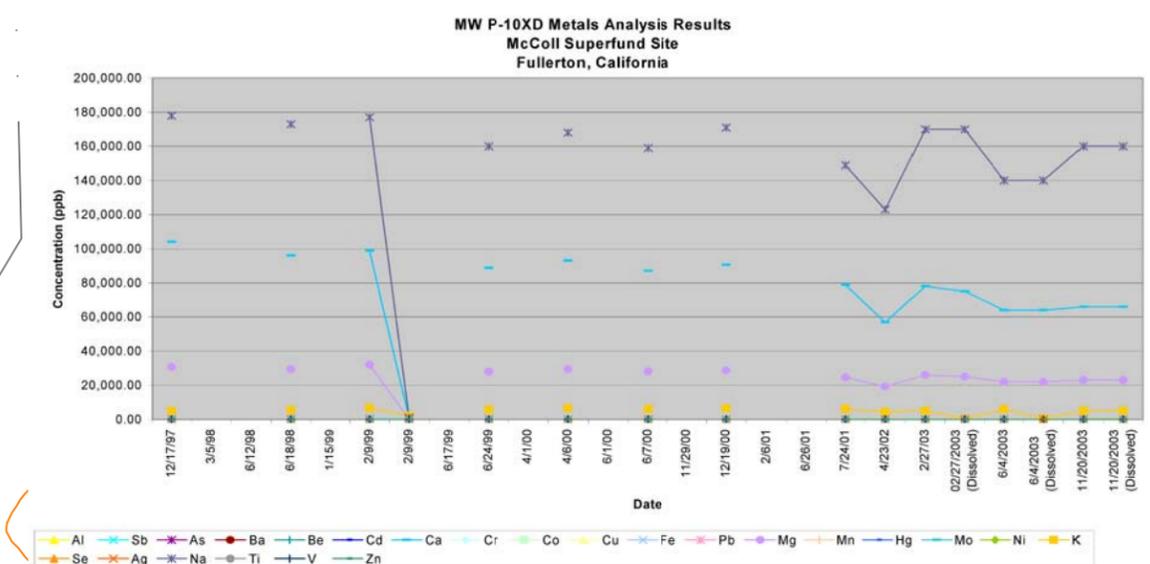
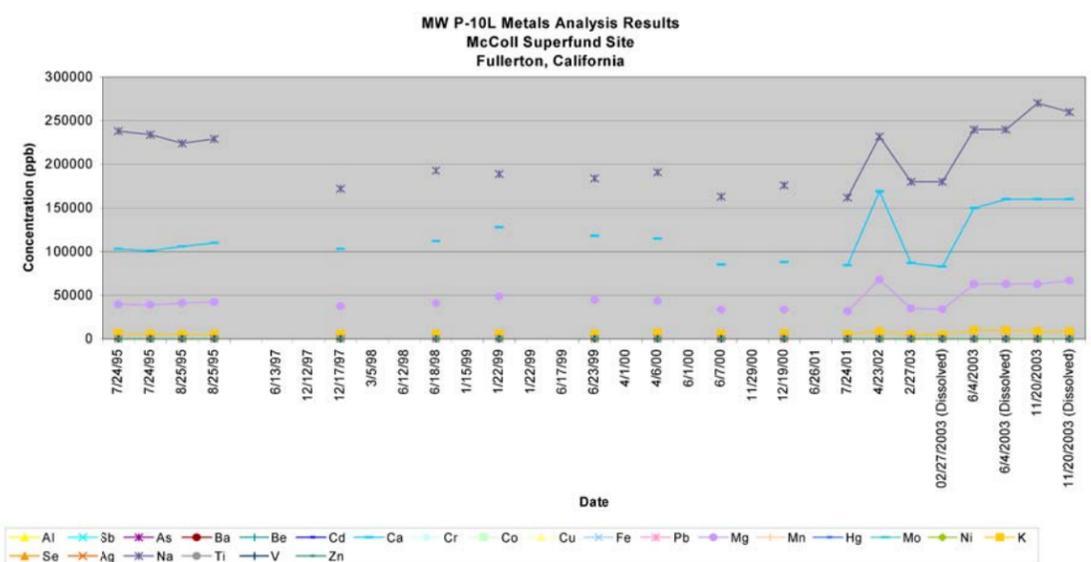
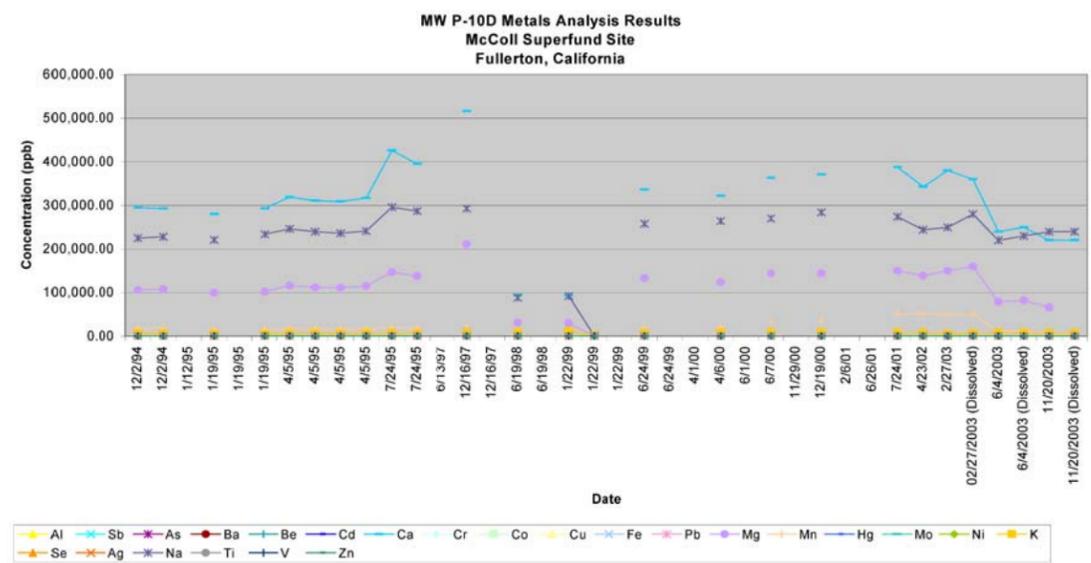
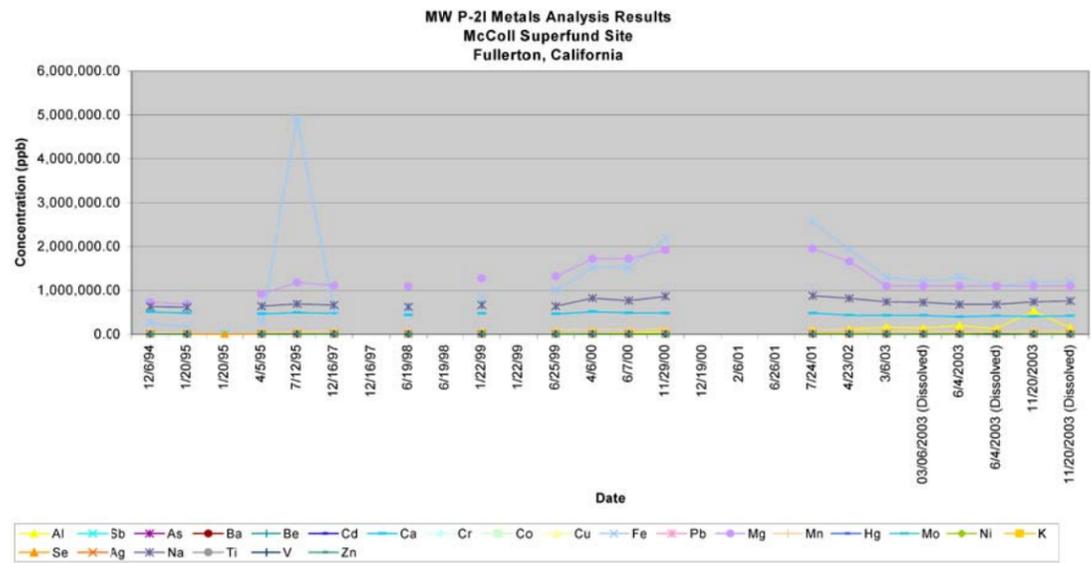


FIGURE 13.0
Metals Laboratory Results
Wells P-2I, P-10XD, P-10D, P-10L, P-9D
McColl Superfund Site

DATE: 11.05.03 PROJECT NO: 02-110 REV: 01

C2 REM
AN ENVIRONMENTAL MANAGEMENT
ENGINEERING AND DEVELOPMENT COMPANY
NEWPORT BEACH, CALIFORNIA 949.261.8098

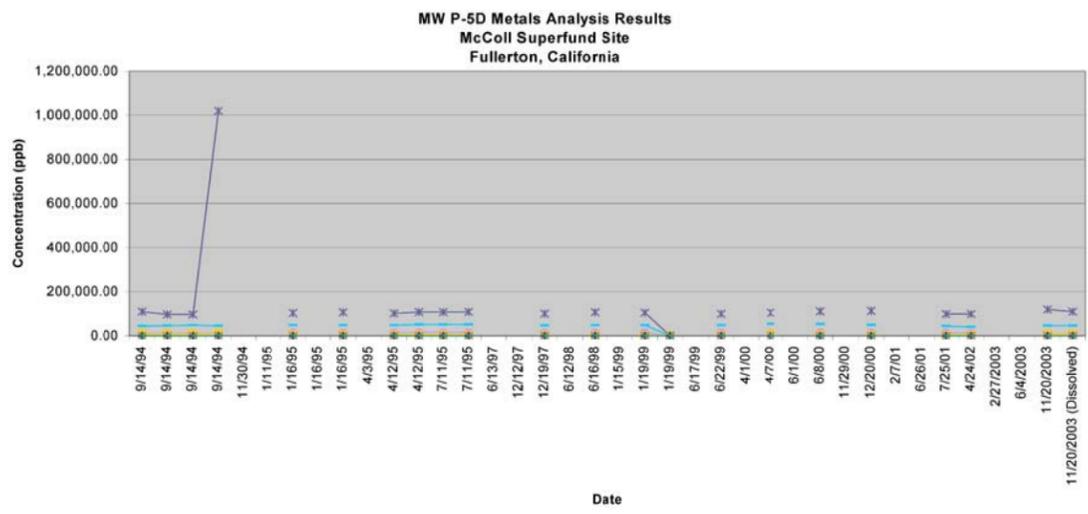
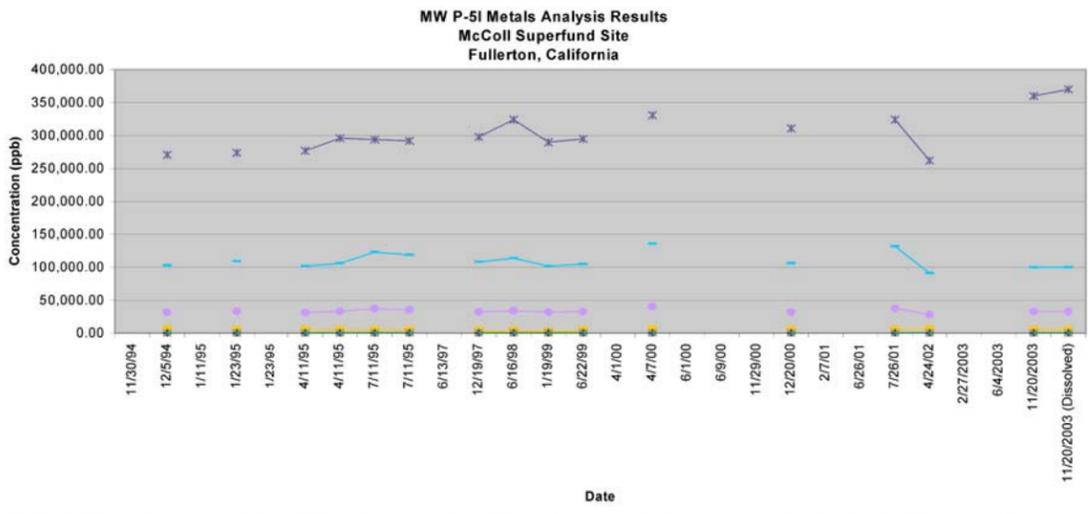
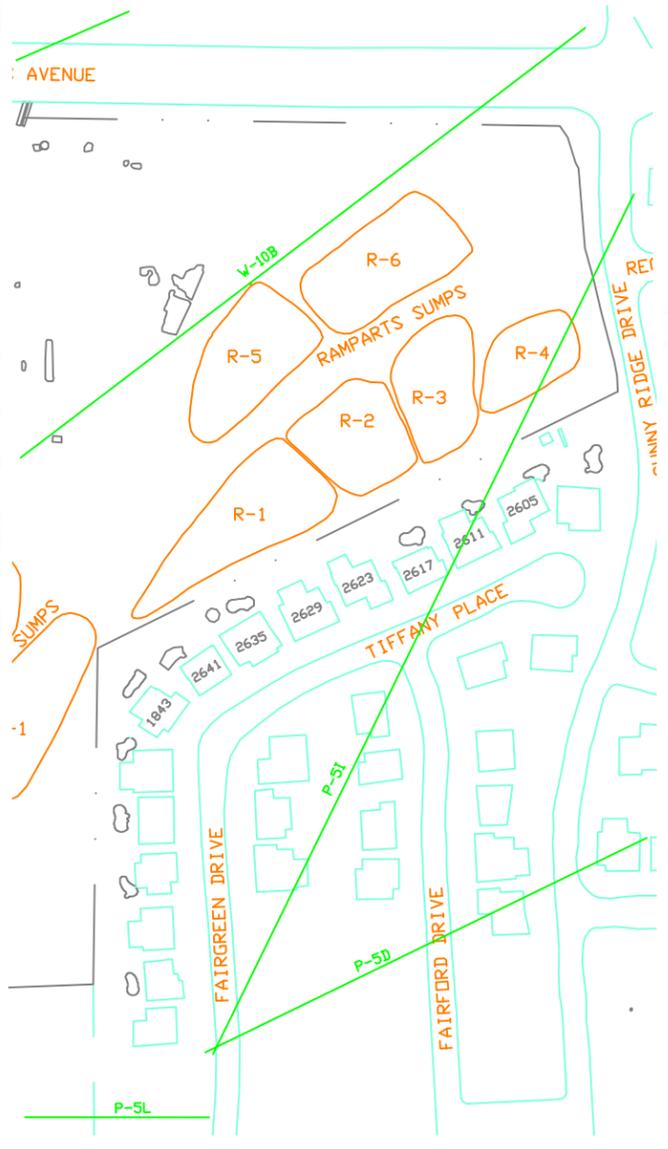
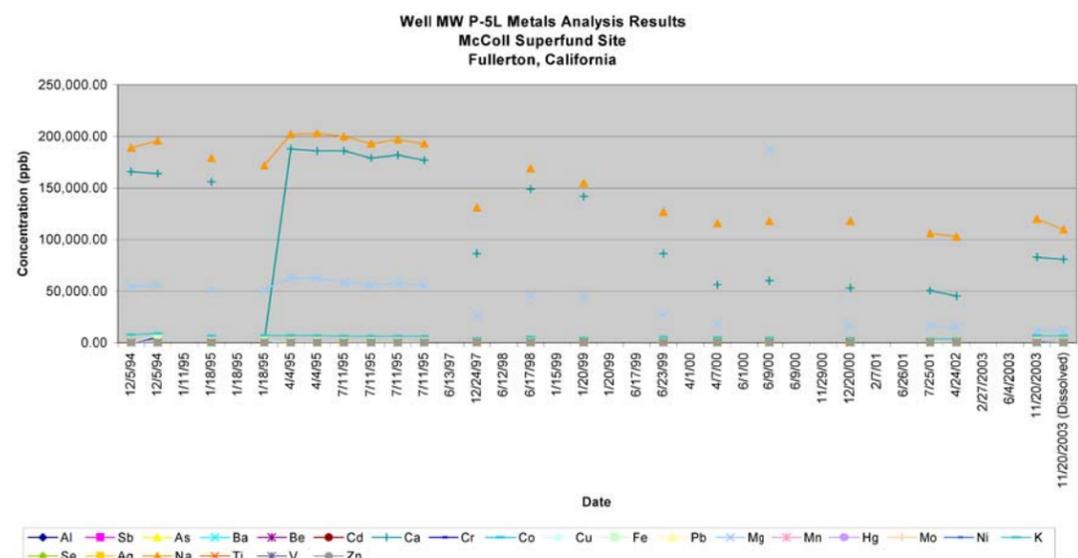
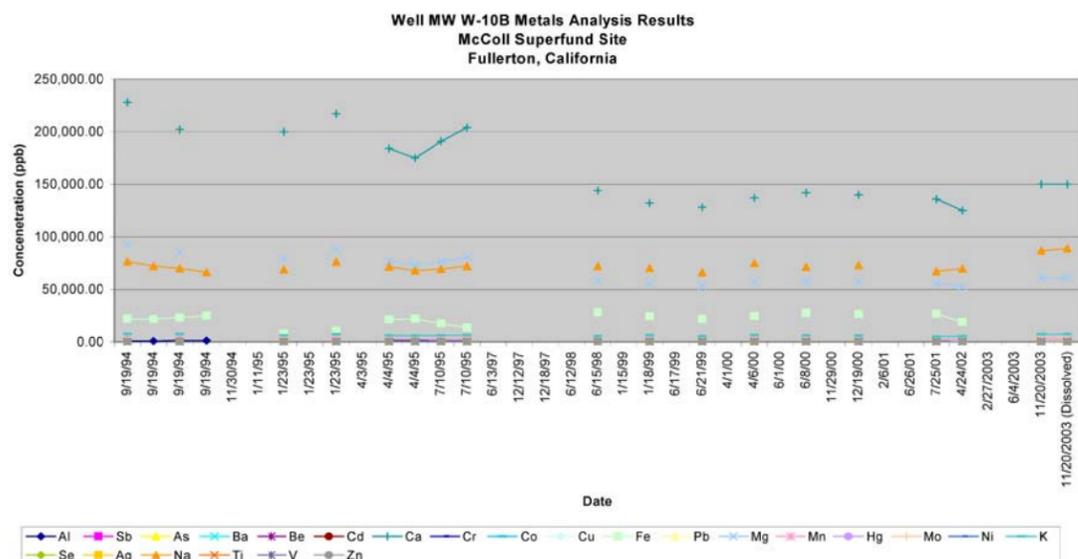
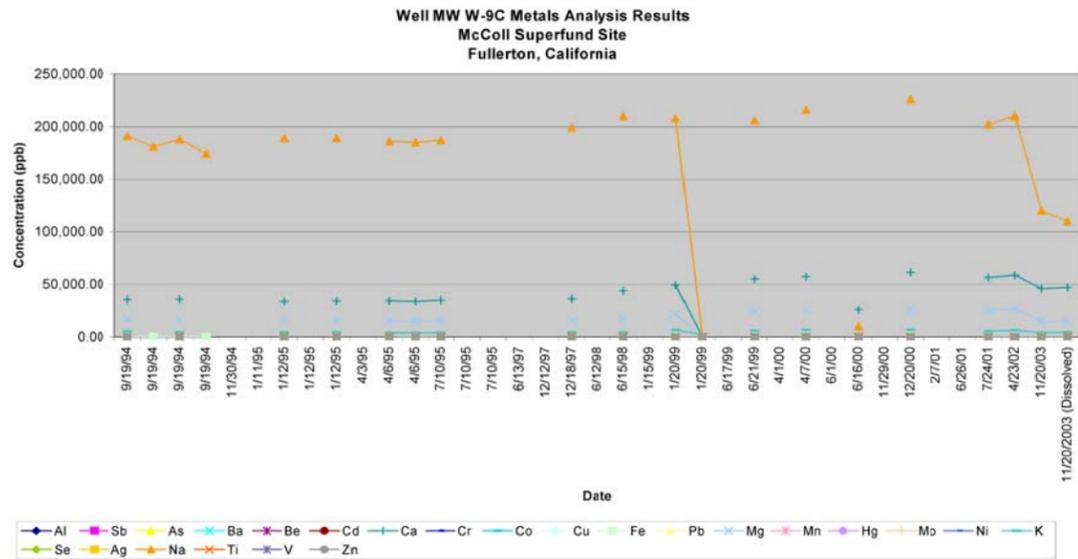


FIGURE 14.0
Metals Laboratory Results
Wells P-5I, P-5D, P-5L, W-9C, W-10B
McColl Superfund Site

DATE: 11.05.03	PROJECT NO: 02-110	REV: 01
----------------	--------------------	---------

C2 REM
AN ENVIRONMENTAL MANAGEMENT
ENGINEERING AND DEVELOPMENT COMPANY
NEWPORT BEACH, CALIFORNIA 949.261.8098

Figure 15.0
GCTS Modification
McColl Superfund Site
Fullerton, California



A) GCTS effluent stack pre-modifications.



B) Modification to GCTS effluent stack to S-bend for ideal dispersion (December 4, 2003).



C) Modification to GCTS effluent stack to provide drainage in S-bend.