09.01-01/16/98-00284

DEPARTMENT OF THE NAVY
NAVAL AMPHIBIOUS BASE LITTLE CREEK
2600 TARAWA COURT SUITE 100
NORFOLK, VIRGINIA 23521-3229

Feb 98 RAB Meeting

IN REPLY REFER TO:
5090
Ser N464/0070
January 16, 1998

To Restoration Advisory Board Members, Area Civic Leagues, Interested Citizens, and Environmental Organizations:

Naval Amphibious Base (NAB) Little Creek is pleased to announce the next Public/Restoration Advisory Board (RAB) Meeting on Tuesday, February 10, 1998. The meeting will start at 1:00 p.m. and be held in the third floor "Blue Heron" conference room of the Drexler Manor BOQ, Building 3408. Parking will be available in front of the building in the BOQ residents' lot. See the enclosed map. From the front door, the stairs and the elevator are to the right. On the third floor, the conference room is across the hall from the elevator, and to the left of the stairs.

The topics that will be discussed include the following:

1. Update for Sites 7 and 11

2. Sampling Plan for Sites 12 and 13

As discussed in the last RAB meeting, the remedial action is impending for Site 7, Amphibious Base Landfill. The status of that action will be briefly discussed. An update will also be provided for Site 11, the School of Music Plating Shop, where more sampling is planned.

The majority of the meeting will involve a presentation of the sampling plan for Site 12, the Exchange Laundry Disposal Area, and Site 13, the PCP Dip Tank and Wash Rack. Recent sampling in 1995 and 1997 will also be reviewed. NAB Little Creek intends to sample the sites in the spring of 1998 to fill remaining data gaps and proceed to a Feasibility Study (FS) for Site 12 and possibly an Engineering Evaluation/Cost Analysis (EE/CA) for a removal action at Site 13.

RAB meetings provide an opportunity and forum for a diverse group to discuss subjects related to the environmental restoration program at NAB Little Creek. All RAB meetings are open to the public, and everyone is encouraged to attend. To enable my staff to fully address your concerns, I invite you to call Kelly Greaser at 363-4571 prior to the meeting with any questions you have or any topics you would like to add to the Agenda. I also encourage you to present your comments and concerns during the meeting.

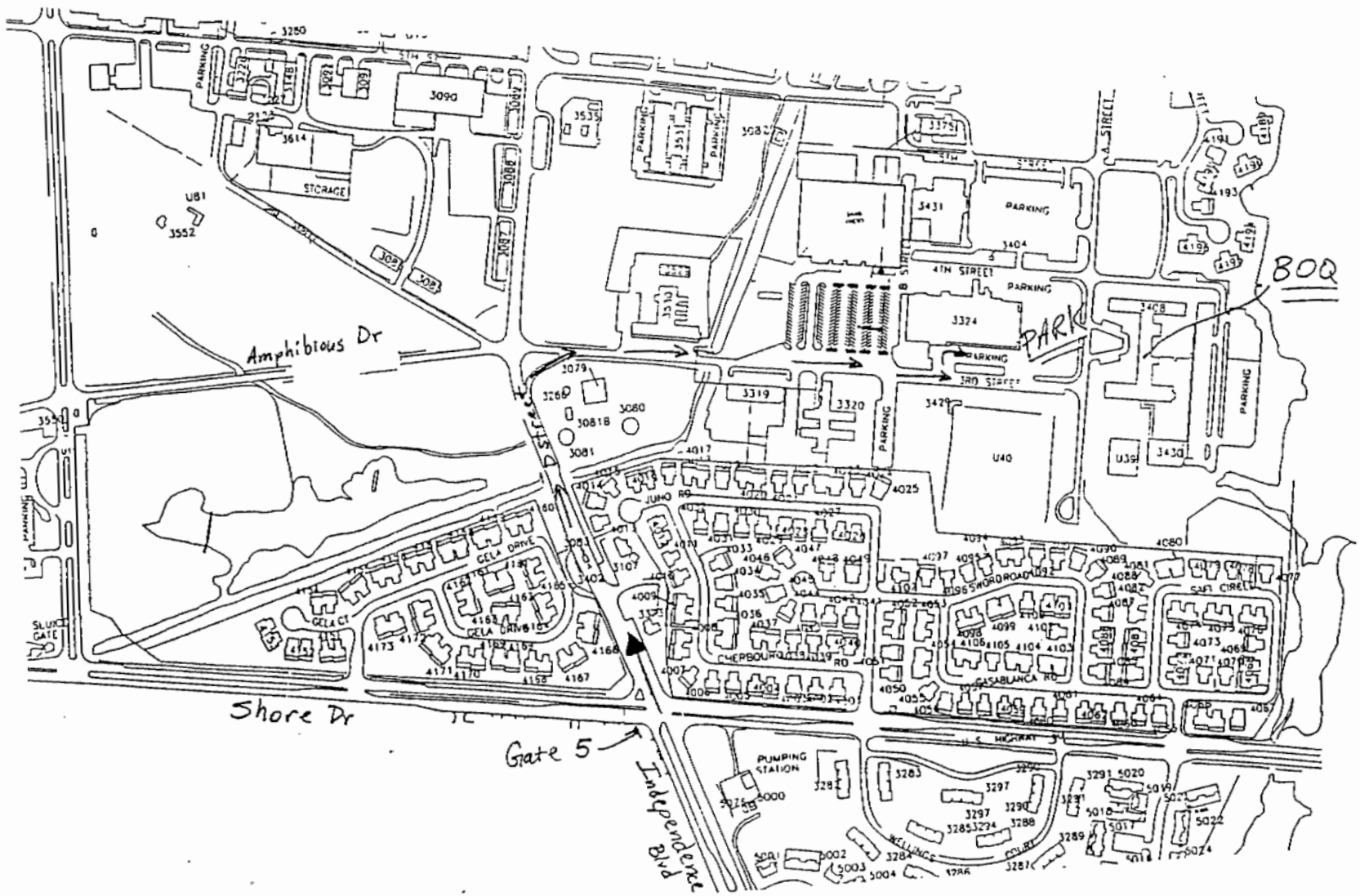
5090
Ser N464/0070
January 16, 1998

If you have any questions, please contact Kelly Greaser at 363-4571. I look forward to meeting with you and keeping the communication lines open.

Sincerely,

S. D. LORD
Commander, CEC, U.S. Navy
By direction of
the Commanding Officer

Enclosure: Base Map


BOQ
Amphibious Dr
Shore Dr
Gate 5
Independence Blvd
4TH STREET
3RD STREET
PARKING
STORAGE
JUNO RD
GELA DRIVE
GELA CT
CHERBOURG RD
SWORD ROAD
CASABLANCA RD
SAFI CIRCLE
PUMPING STATION
U40
U39
U81

Enclosure (1)

Public / Restoration Advisory Board Meeting

NAB Little Creek

February 10, 1998

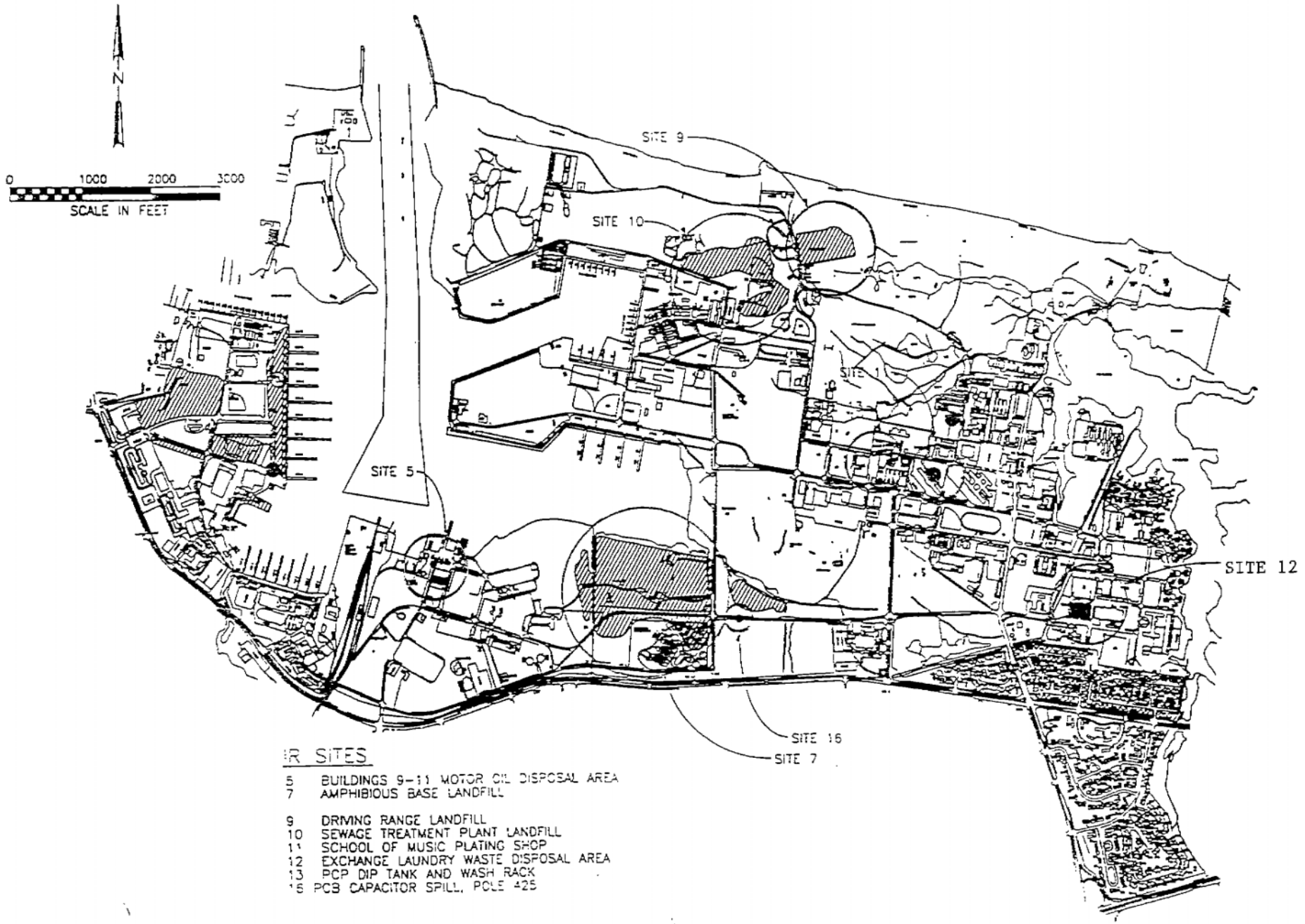
Public/Restoration Advisory Board Meeting
NAB Little Creek
February 10, 1998

Agenda

Welcome *William Niven, Deputy Base Civil Engineer*	1:00
Introductions, Agenda *Kelly Greaser, IR Program Manager, Navy Co-Chair*	1:05
Site 7 and Site 11 Update	1:10
Site 12 Technology Discussion, Data Review, Future Sampling Plan *Kelly Greaser*	1:15
BREAK	2:15
Site 13 Data Review, Future Sampling Plan *Scott MacEwen, CH2M HILL*	2:30
Question and Answer Period	3:00
Meeting Adjourn	

Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Envir'l Response, Compensation, & Liability Act
CFR	Code of Federal Regulations
cy	cubic yards
1,1-DCA	1,1 - Dichloroethane
1,1-DCE	1,1 - Dichloroethene
cis 1,2-DCE	*cis* 1,2-Dichloroethene
trans 1,2-DCE	*trans* 1,2-Dichloroethene
DD	Decision Document
E.O.	Executive Order
Fe	Iron
FS	Feasibility Study
GW	Groundwater
GWMP	Groundwater Monitoring Plan
IR	Installation Restoration
IRI	Interim Remedial Investigation
ITT	Innovative Treatment Technology
IWA	In Well Aeration
LANTDIV	Naval Facilities Engineering Command, Atlantic Division
MCL	Maximum Contaminant Level
Mn	Manganese
NA	Natural Attenuation
NCP	National Oil & Hazardous Substances Pollution Contingency Plan
NFRAP	No Further Response/Remedial Action Palnned
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PCP	Pentachlorophenol
Pest/PCB	Pesticides and Polychlorinated Biphenyl
ppb	part per billion
ppm	part per million
PRAP	Proposed Remedial Action Plan
PSI	Preliminary Site Inspection
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RBC	Risk Based Concentration
RI/FS	Remedial Investigation/Feasibility Study
RVS	Round 1 Verification Step
SB	Subsurface Soil
SED	Sediment
SI	Site Inspection
SRI	Supplemental Remedial Investigation
SS	Surface Soil
SVOC	Semi-Volatile Organic Compound
SW	Surface Water
TCE	Trichloroethene
TI	Thallium
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbon
VC	Vinyl Chloride
VOC	Volatile Organic Compound



R SITES

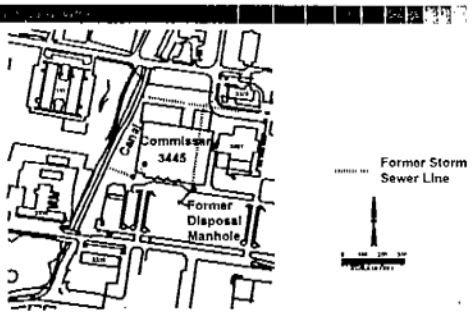
5 BUILDINGS 9-11 MOTOR OIL DISPOSAL AREA
7 AMPHIBIOUS BASE LANDFILL

9 DRIVING RANGE LANDFILL
10 SEWAGE TREATMENT PLANT LANDFILL
11 SCHOOL OF MUSIC PLATING SHOP
12 EXCHANGE LAUNDRY WASTE DISPOSAL AREA
13 PCP DIP TANK AND WASH RACK
16 PCB CAPACITOR SPILL, POLE 425

Site 12
Exchange Laundry Disposal Area

- NEX Exchange Laundry operated from 1973 to 1978
- Disposed ~200 gal. of PCE sludge, ~1120 gal. of soap, sizing, and dye in storm sewer
- Building was demolished in 1987
- Storm sewer was removed by 1993
- New Commissary built in 1993

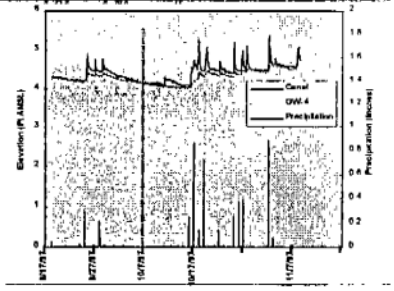
Site 12
Exchange Laundry Disposal Area



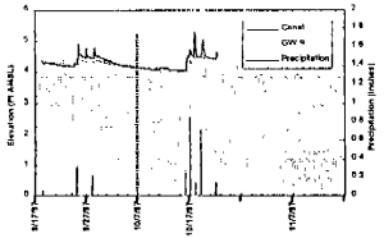
Site 12
Exchange Laundry Disposal Area

- Columbia Aquifer: topsoil > 4' clay> 1' mix sand/clay > to 24' bgs fine to medium sand
- Yorktown Formation: 20-40' confining beds > Yorktown aquifer coarse/fine sand
- Hydraulic Gradient: $1.2X10^{-3}$ ft/ft, W/SW
- Groundwater Velocity: 100 ft/year should 300 ft/yr
- Canal: Hydraulic divide

Hydrograph: GW4
Southern Gaging Station



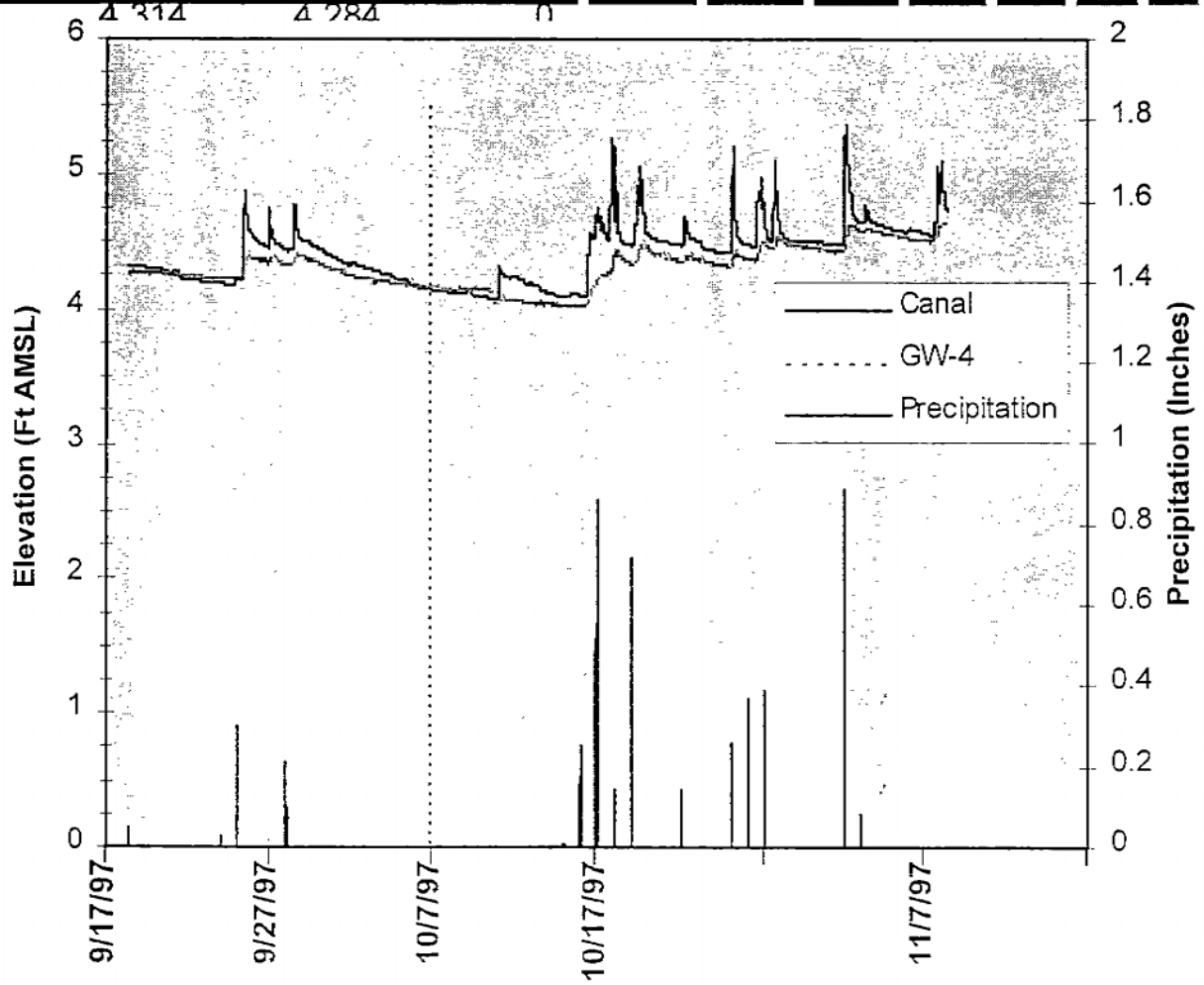
Hydrograph: GW9
Northern Gaging Location



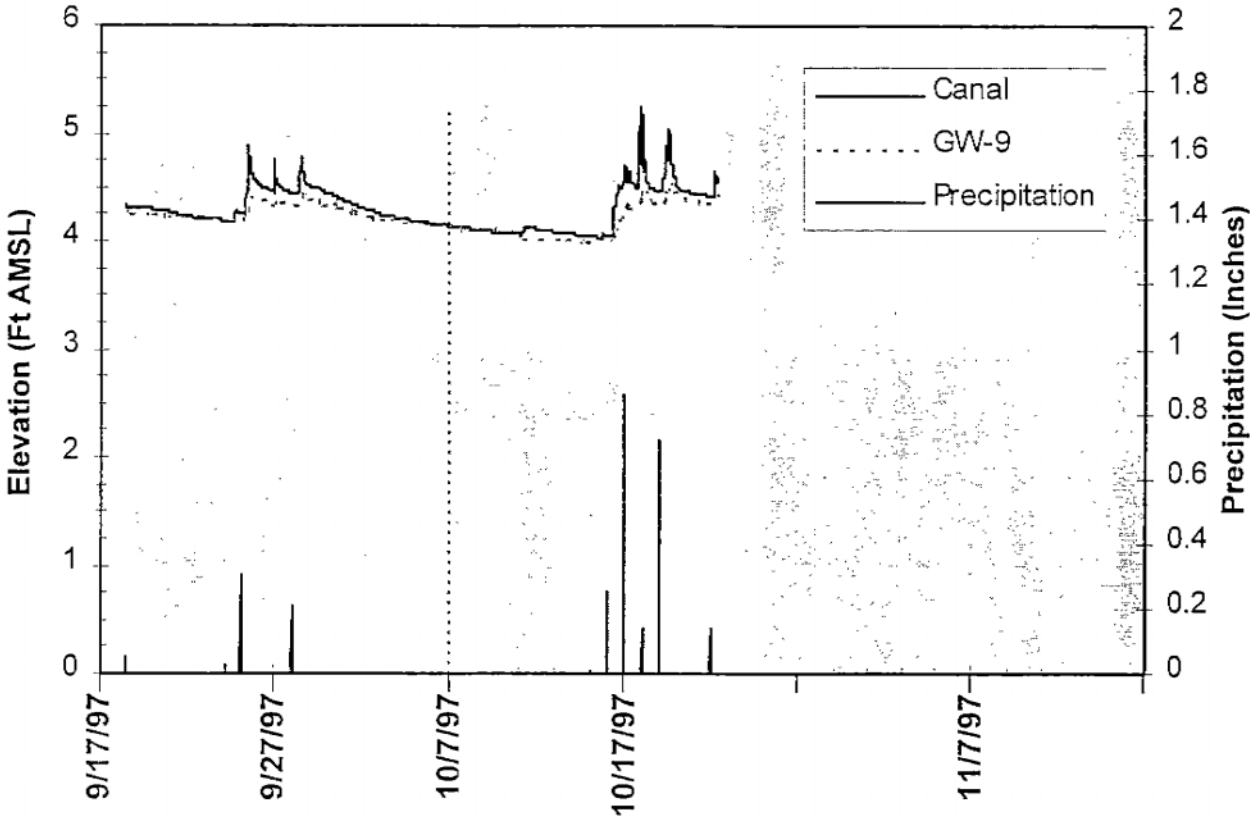
NA Acceptance Criteria

- Technical analysis which provides confidence in the ability of NA to achieve remediation goals in reasonable time frame
- No current or future risks from the site
- Shrinking or stable plume
- Performance monitoring required
- Backup or contingency remedies may be necessary

Hydrograph: GW4
Southern Gaging Station



Hydrograph: GW9 Northern Gaging Location



In Well Aeration

- Combines air lift pumping, air stripping and groundwater circulation
- Air is pumped into the bottom of the well, causing the air/water mixture to rise - air lift pumping

In Well Aeration

- Lower well screen allows infiltration of contaminated water
- As the air/water mixture travels up the well, the volatile contaminants transfer to the air - air stripping
- Packer at the top forces the water to return to the water table, forms a circulation cell
- Air reenters the well above the packer due to vacuum from second blower

In Well Aeration

- The contaminated air is treated above ground
- Optional screen in the vadose zone can draw more air through the system to treat the vadose zone
- The treated air can be pumped back through the system to reduce fouling problems caused by precipitation of iron and calcium

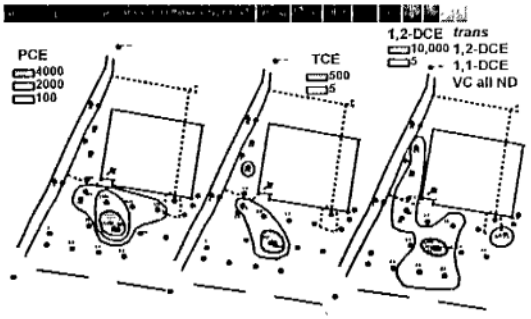
In Well Aeration Advantages

- Groundwater is not pumped above ground, so no water treatment or disposal is necessary
- IWA uses less equipment
- IWA requires less air for the system
- High stripping efficiencies, 99%, possible
- Zone of influence greater
- Groundwater circulation cell increases desorption from soil, decreasing rebound

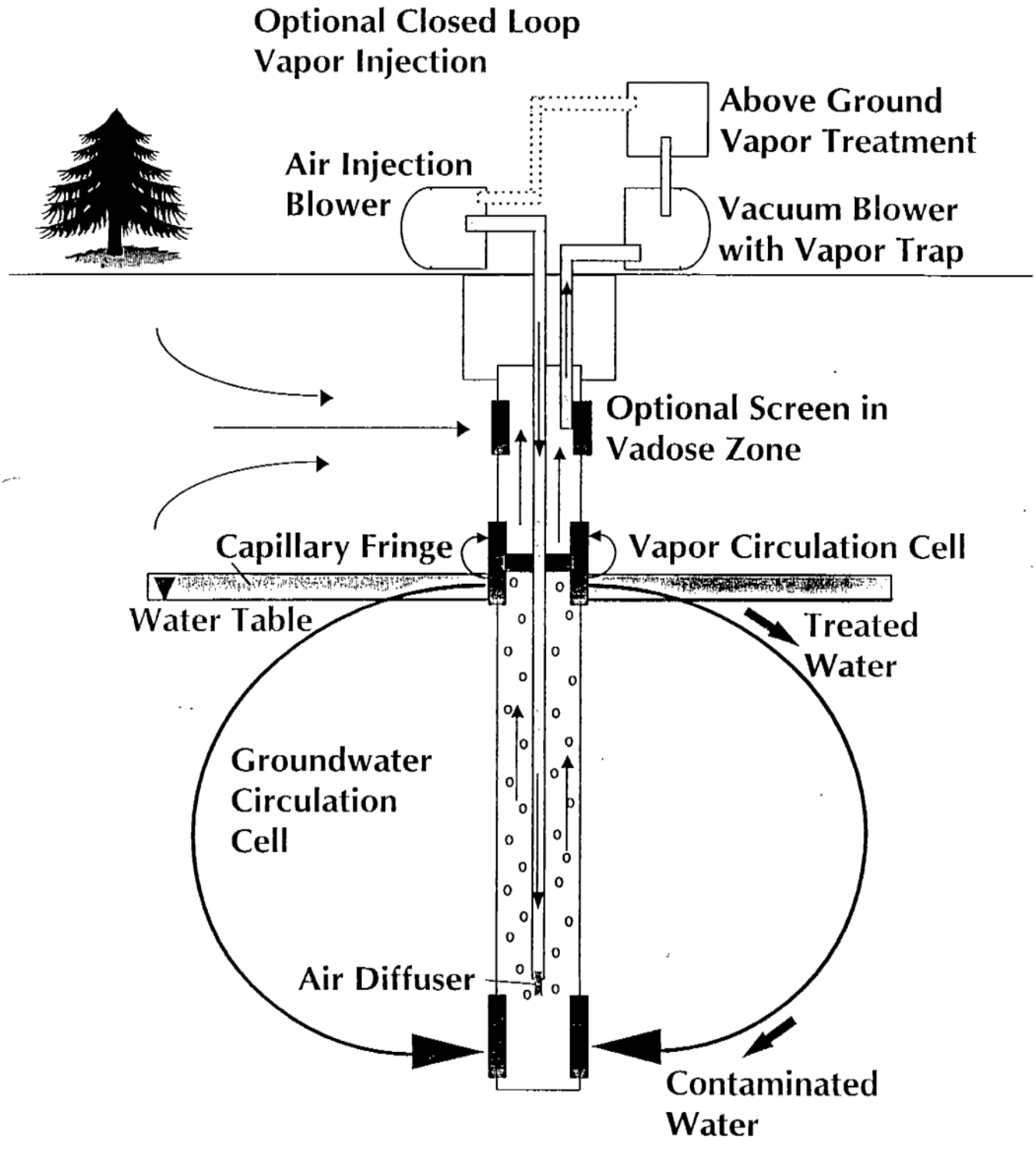
In Well Aeration Disadvantages

- Precipitation of iron and calcium compounds can foul or plug wells
- Shallow and thin aquifers can prevent full development of groundwater circulation cells
- Air permitting requirements can be extensive

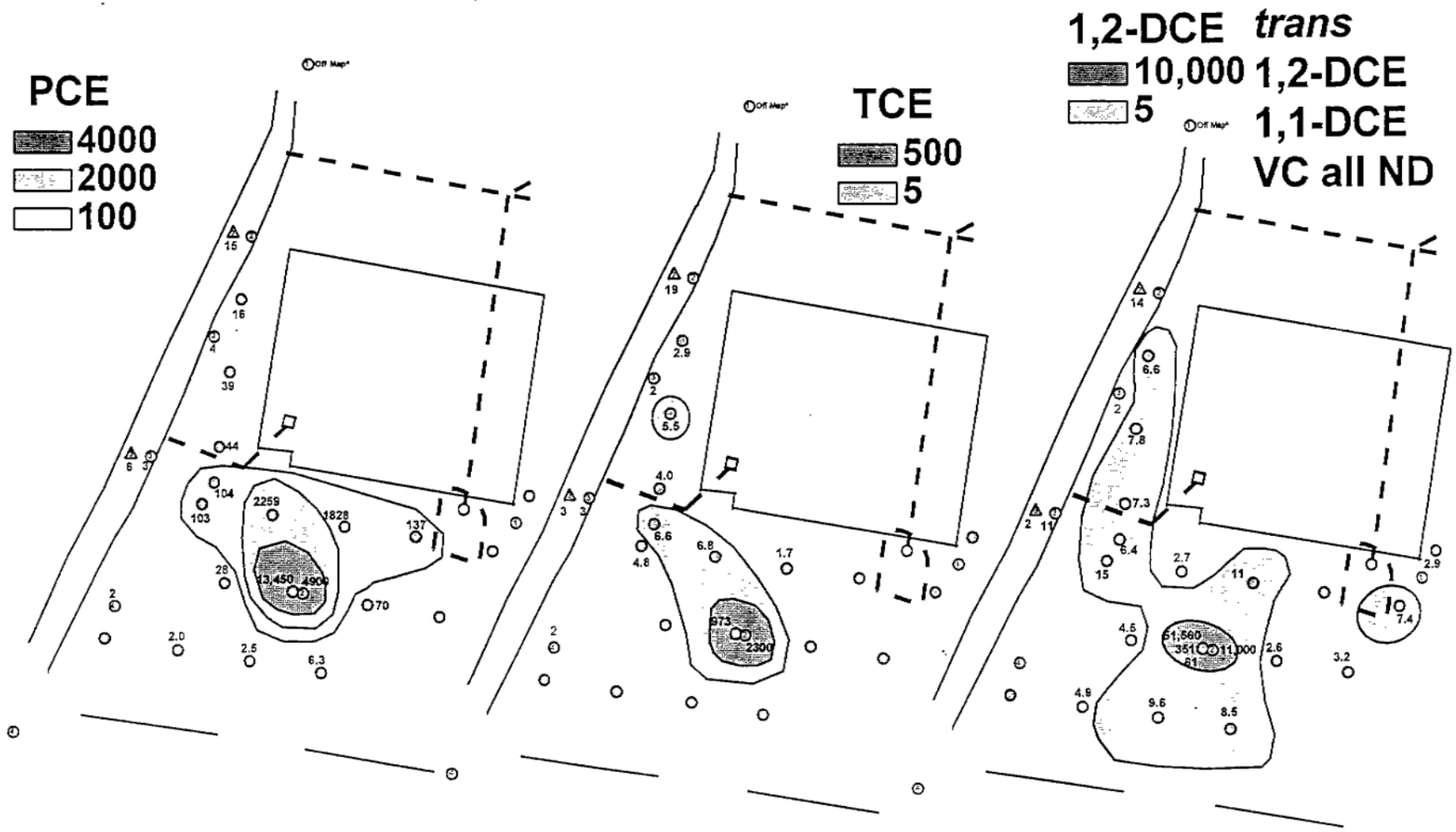
Site 12 Data RI/FS 1993 (ppb)



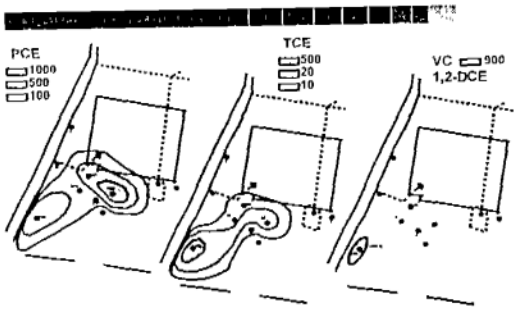
In Well Aeration Design



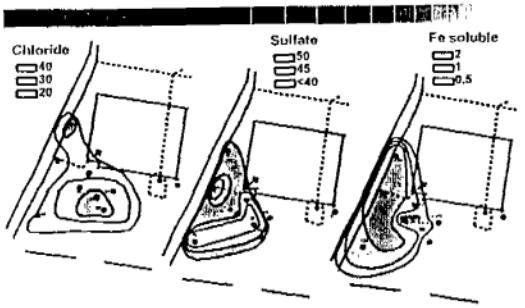
Site 12 Data RI/FS 1993 (ppb)



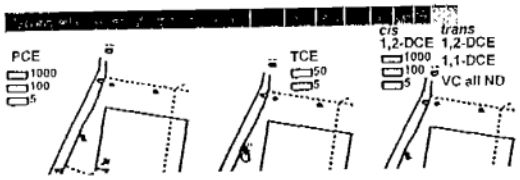
Site 12 Data SRI(1) 1995 (ppb)



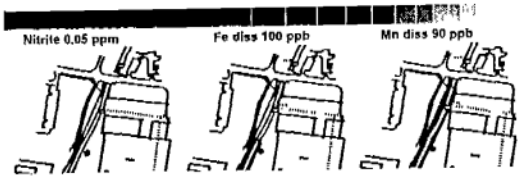
Site 12 Data SRI(1) 1995 (ppm)



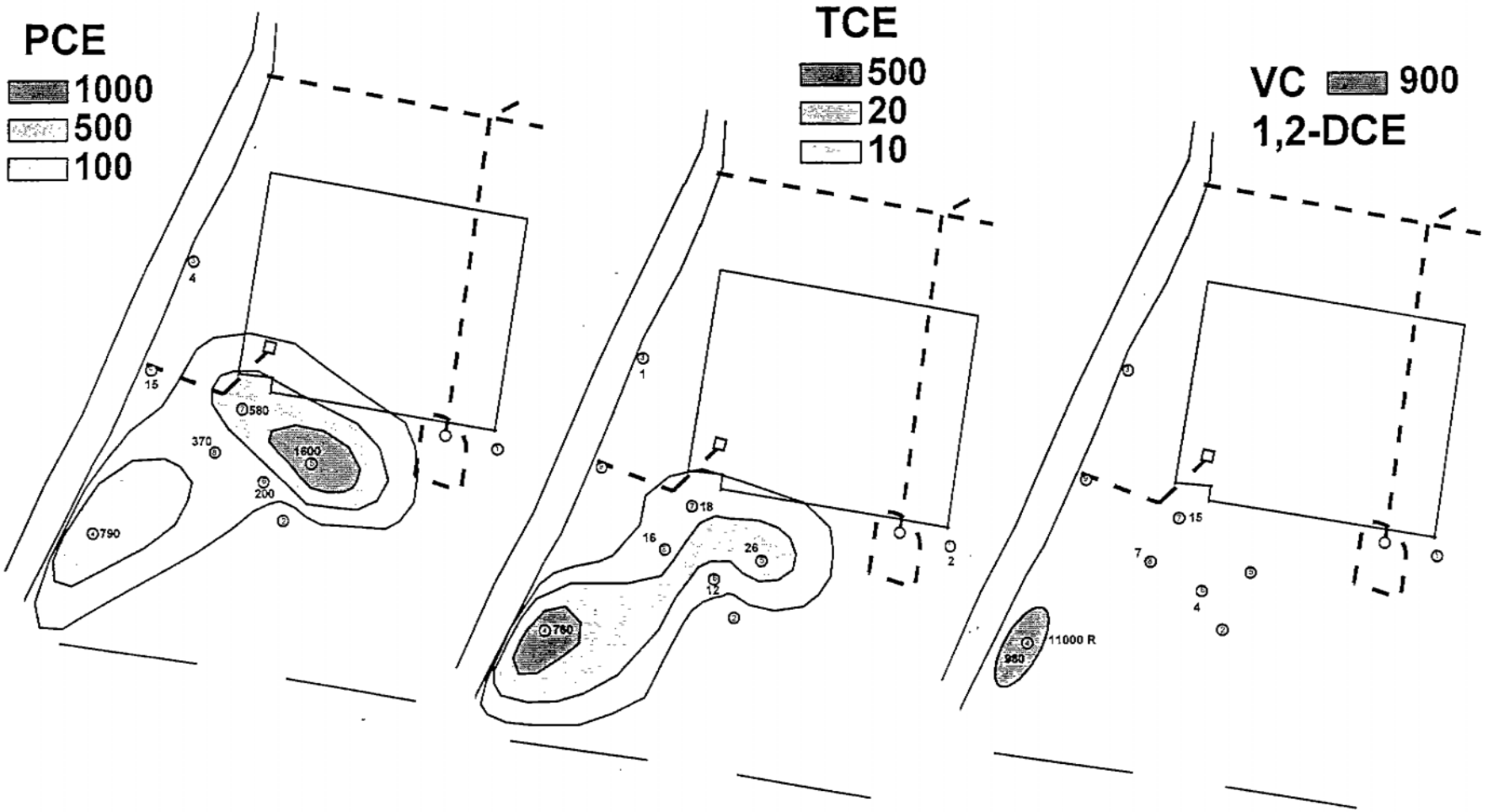
Site 12 Data SRI (2) 1997 (ppb)



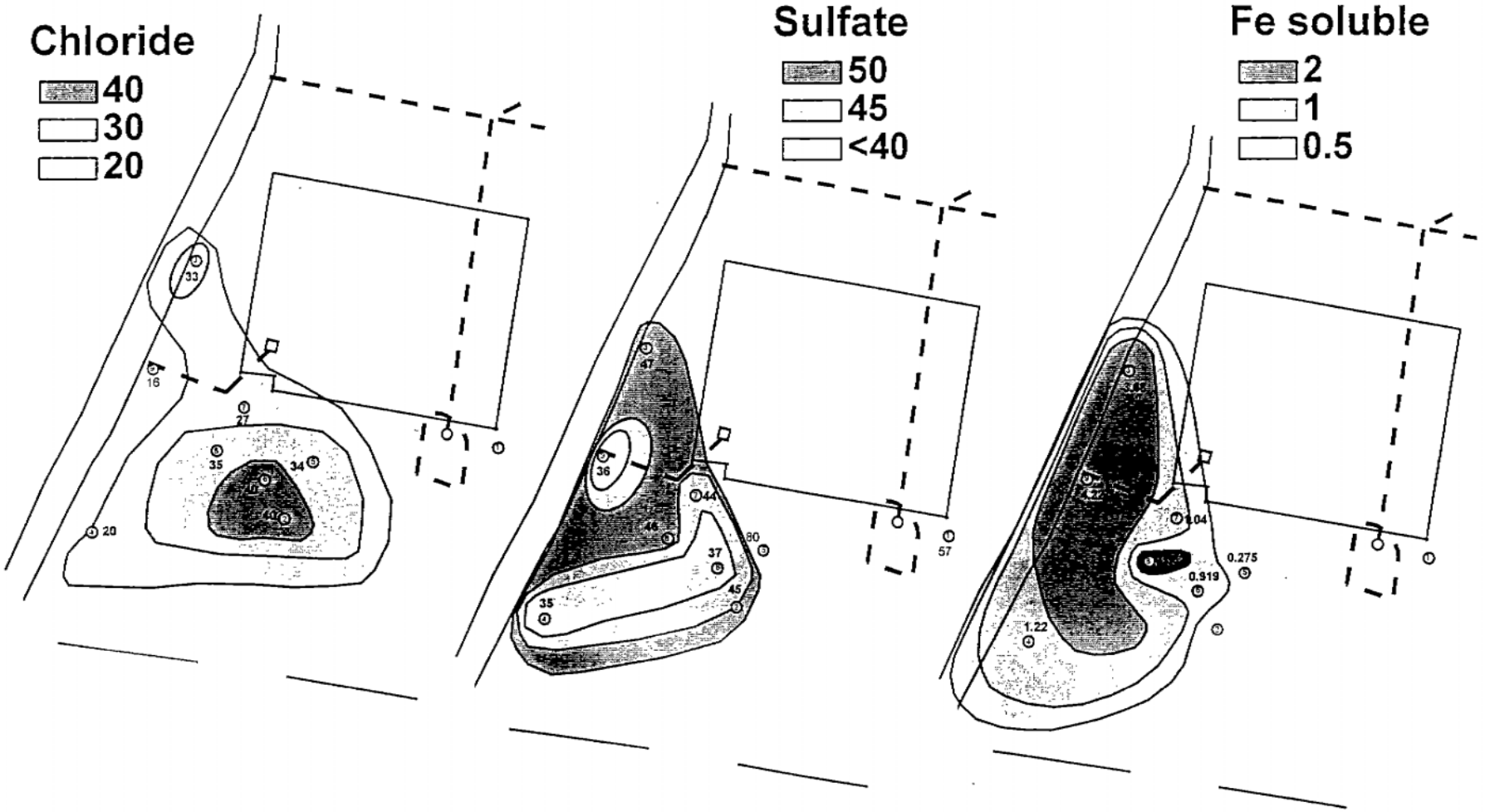
Surface Water
Anion Data SRI(2) 1997



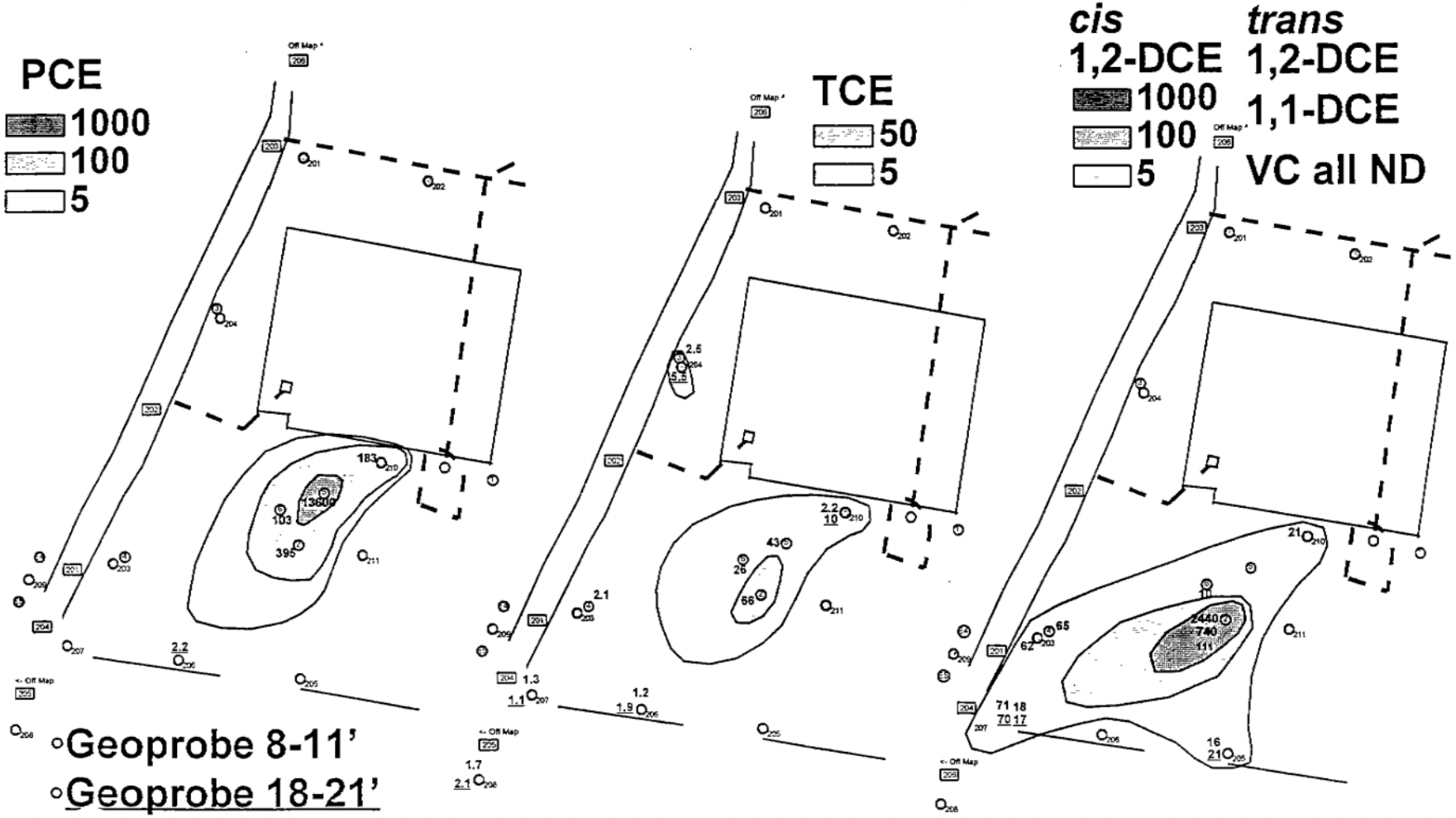
Site 12 Data SRI(1) 1995 (ppb)



Site 12 Data SRI(1) 1995 (ppm)



Site 12 Data SRI (2) 1997 (ppb)



Supplemental Remedial Investigation Phase 2 Field Investigation, Oct 1997, Results for Chlorinated Solvents

Groundwater Wells (ppb)	GW1	GW2	GW3	GW4	GW5	GW6	ESE4	ESE5
Tetrachloroethene (PCE)		395			13600	103		
Trichloroethene (TCE)		66	2.5	2.1	43	26		
cis 1,2-Dichloroethene (*cis* 1,2-DCE)		2440		65		10		
trans 1,2-Dichloroethene (*trans* 1,2-DCE)		740						
1,1-Dichloroethene (1,1-DCE)		111						
Vinyl Chloride (VC)								
Total Chlorinated VOCs	0	3752	2.5	67.1	13643	139	0	0

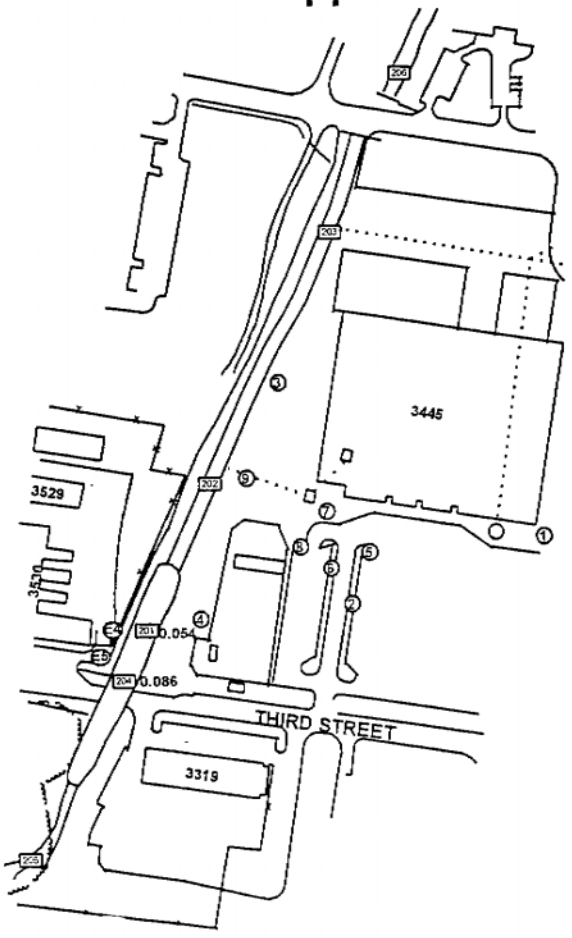
Geoprobe Samples (ppb)	203-05	204-10	205-05	205-10	206-05	206-10	207-05	207-10	208-05	208-10	210-05	210-10
Tetrachloroethene (PCE)											183	
Trichloroethene (TCE)		5.5			1.2	1.9	1.3	1.1	1.7	2.1	2.2	10
cis 1,2-Dichloroethene (*cis* 1,2-DCE)	62		16	21		2.2	71	70			21	
trans 1,2-Dichloroethene (*trans* 1,2-DCE)							18	17				
1,1-Dichloroethene (1,1-DCE)												
Vinyl Chloride (VC)												
Total Chlorinated VOCs	62	5.5	16	21	1.2	4.1	90.3	88.1	1.7	2.1	206.2	10
Samples 201-09, 202-09, 209-10, 211-05, and 211-10 all Non-Detect												
-05 Samples taken from 8-11'; -10 Samples taken from 18-21'; -09 Samples taken from 16-19'												

Surface Water (ppb)	SW201	SW202	SW203	SW204	SW205	SW206
Chlorinated Solvents (ppb)	◄ All Non-Detect ►					

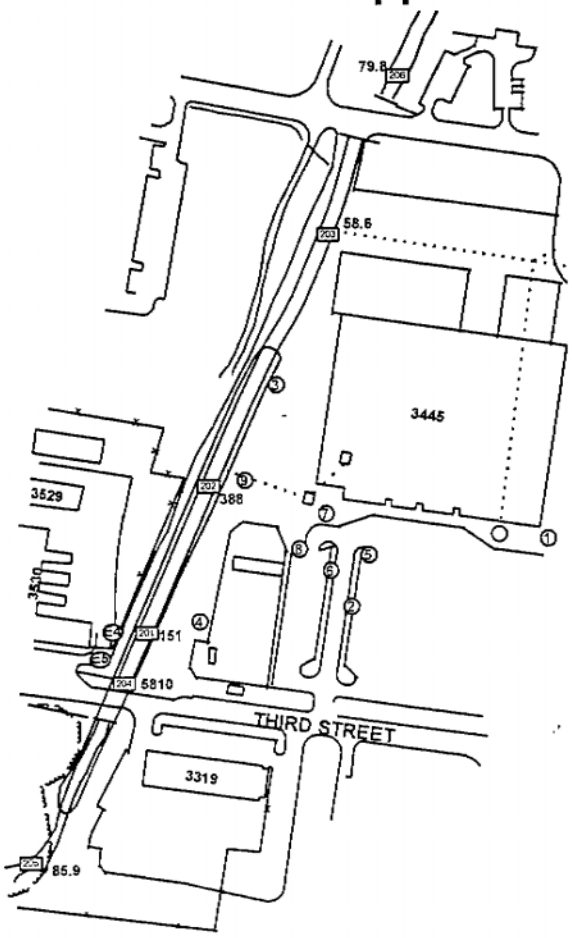
Sediment (ppb)	201-01	201-02	202-01	202-02	203-01	203-02	204-01	204-02	205-01	205-02	206-01	206-02
Chlorinated Solvents (ppb)	◄ All Non-Detect ►											
-01 Samples taken from 0-6"; -02 Samples taken from 12-24"												

Surface Water
Anion Data SRI(2) 1997

Nitrite 0.05 ppm



Fe diss 100 ppb



Mn diss 90 ppb

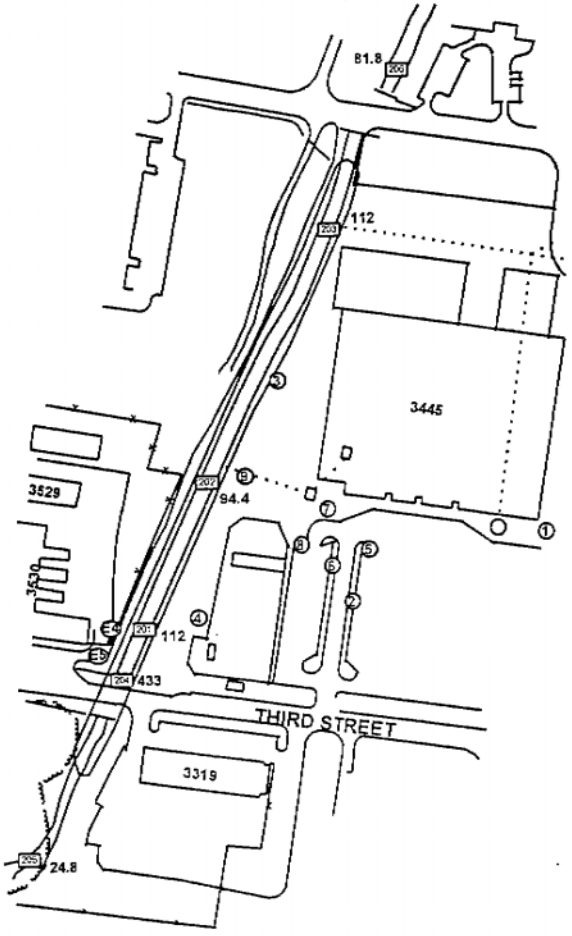


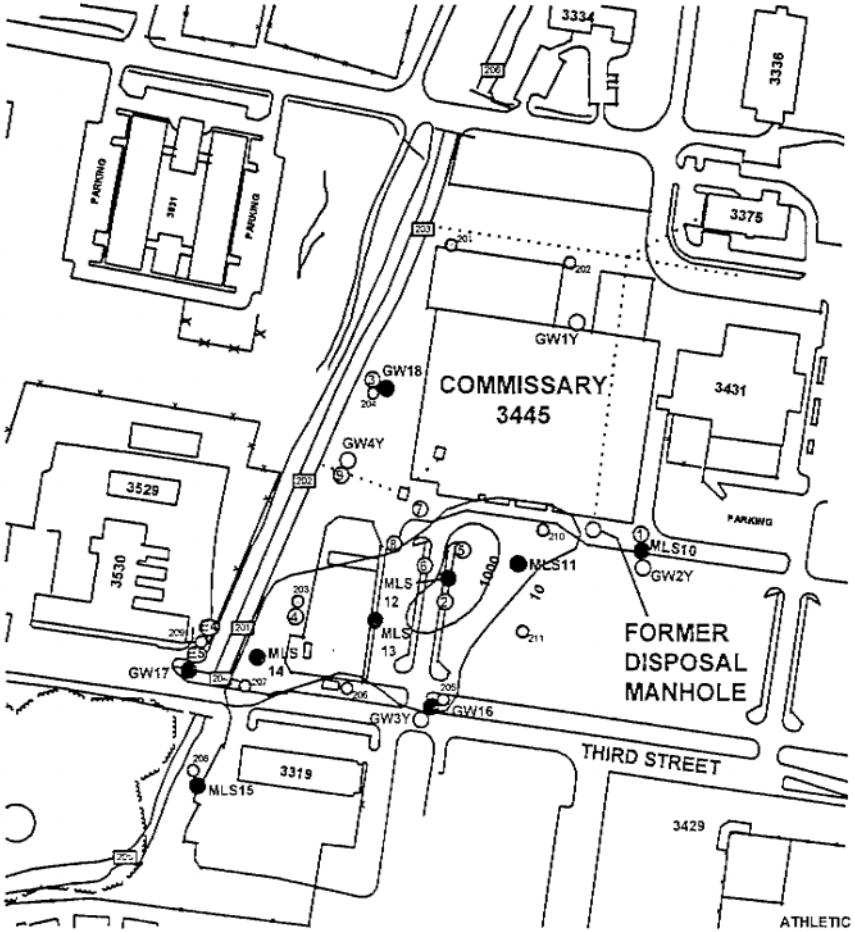
Table 3. Analyt[illegible]lts* - Surface Water
Site 12-Exchange [illegible] / Waste Disposal Area
Naval Amphibious Base Little Creek
Virginia Beach, Virginia

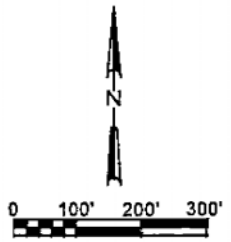
Sample Identification Sample Collection Date				LC12-SW201 10/8/97	LC12-SW200** 10/8/97	LC12-SW202 10/8/97	LC12-SW203 10/8/97	LC12-SW204 10/8/97	LC12-SW205 10/8/97	LC12-SW206 10/8/97
INORGANICS	Method	DL	Units							
Alkalinity as $CaCO_3$	EPA 310.1	2.0	mg/L	34	34	46	55	83	23	35
Chloride	EPA 325.3	5.0	mg/L	8.86	23	14.2	12.4	10 6	5 U	10.6
Hardness as $CaCO_3$	EPA 200.7	2.0	mg/L	33	34	40	47	74	27	32
Nitrogen, Nitrate	EPA 353.2	0.05	mg/L	1.11	1.17	1.25	1.01	1.19	0.894	0.914
Nitrogen, Nitrite	EPA 353.2	0.05	mg/L	0.054	0.075	0.05 U	0.05 U	0.086	0.05 U	0.05 U
Sulfate	EPA 375.4	1.0	mg/L	7.69	6.33	2.93	4.97	10.4	9.39	1.91
Total Organic Carbon	9060	10	mg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Iron (total)	ILM03	17	µg/L	3570	3820	2330	3100	23200	1320	2860
Iron (dissolved)	ILM03	17	µg/L	151	109	386	58.6 B	5810	85.9 B	79.8 B
Manganese (total)	ILM03	1.0	µg/L	906	1010	312	158	580	120	440
Manganese (dissolved)	ILM03	1.0	µg/L	112	93.9	94.4	112	433	24.8	81.8
ORGANICS	Method	DL	Units							
Methane	OLM03.0	0.2	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	3500 2	0.2 U	0.2 U
Ethene	OLM03.0	2.0	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethane	OLM03.0	2.0	µg/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	OLM03.0	1.0	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	OLM03.0	1.0	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	OLM03.0	1.0	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	OLM03.0	1.0	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	OLM03.0	1.0	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U

Footnotes:

*: Unvalidated data.
**: Duplicate of sample LC12-SW201.
B: Concentration less than the Contract Required Detection Limit but greater than or equal to the Instrument Detection Limit.
$CaCO_3$: Calcium carbonate.
DL: Detection limit.
mg/L: milligrams per liter
NA: Not analyzed.
U: Analyte not detected above the sample detection limit.
µg/L: micrograms per liter.

Future Sampling for Site 12
SRI(2) Spring 1998





LEGEND

- FORMER STORM SEWER LINE
- ① CURRENT MONITORING WELL
- O_{211} PHASE II SRI GEOPROBE LOCATION
- 205 PHASE II SRI SURFACE WATER AND SEDIMENT SAMPLE LOCATION
- GW10 / MLS11 ● PROPOSED MONITORING WELL OR MLS WATER TABLE AQUIFER
- GW1Y ○ PROPOSED MONITORING WELL YORKTOWN AQUIFER
- TOTAL CHLORINATED VOCs IN GROUNDWATER, 10/97 (ppb)

Site 12 Schedule

- SRI(2) sampling event Apr-Jul 1998
- SRI Report Sept 1998
- Focused Feasibility Study May 1999
- RAB Meeting after the FFS
- PRAP/DD FY 1999
- Remedial Design FY 1999
- Remedial Action FY 2000

Site 13 - Public Works PCP Dip Tank and Wash Rack: History

- Dip Tank - Former 400 gallon tank and drying racks used to treat wood with pentachlorophenol (PCP) - early 1960's to 1974
- Tank cleaned out in 1975 and removed in 1982
- Area has been paved and is now a Public Works storage area

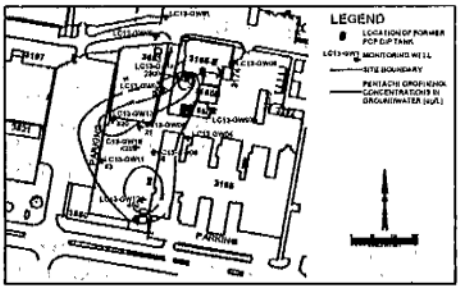
Site 13 - Public Works PCP Dip Tank and Wash Rack: History

- Wash rack - 20' x 20' concrete pad surrounded by a concrete berm with a floor drain leading to an oil-water separator
- Used as an area to steam or chemically clean vehicles and other equipment
- Still in use
  - Chemicals now used are biodegradable

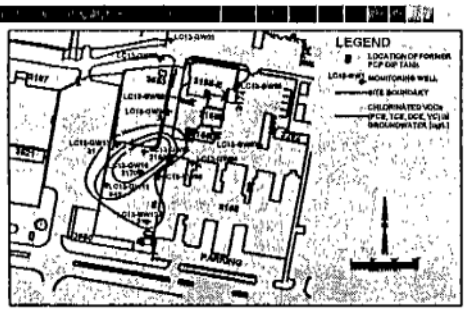
Site 13 - Previous Environmental Investigations

- Initial Assessment Study - December 1984
- Round 1 Verification Study - October 1986
- Interim Remedial Invest. - November 1991
- Remedial Investigation - November 1994
- Phase I Supplemental Remedial Investigation field activities - 1995

Site 13 - PCP in Groundwater



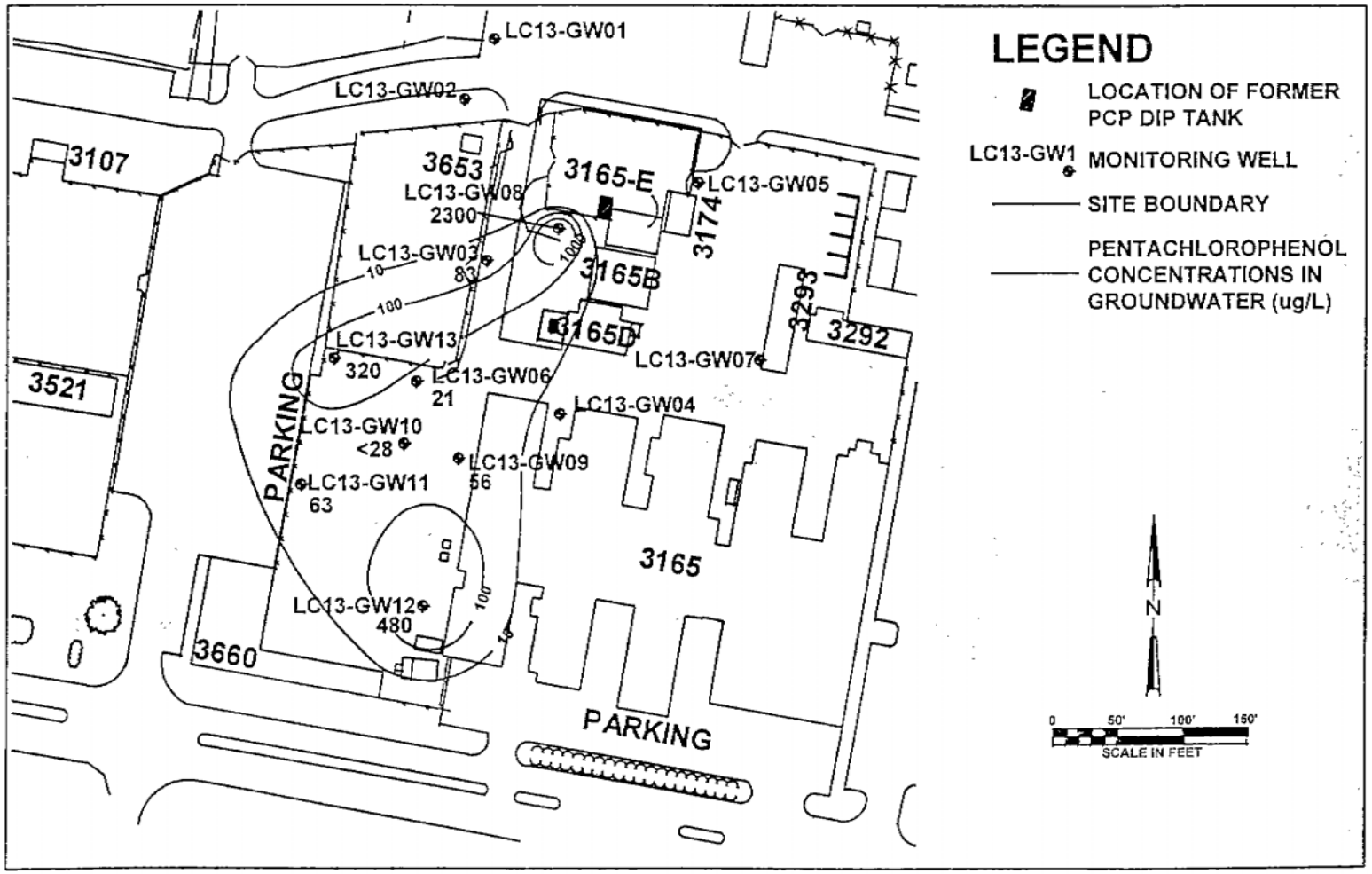
Site 13 - Chlorinated VOCs in GW



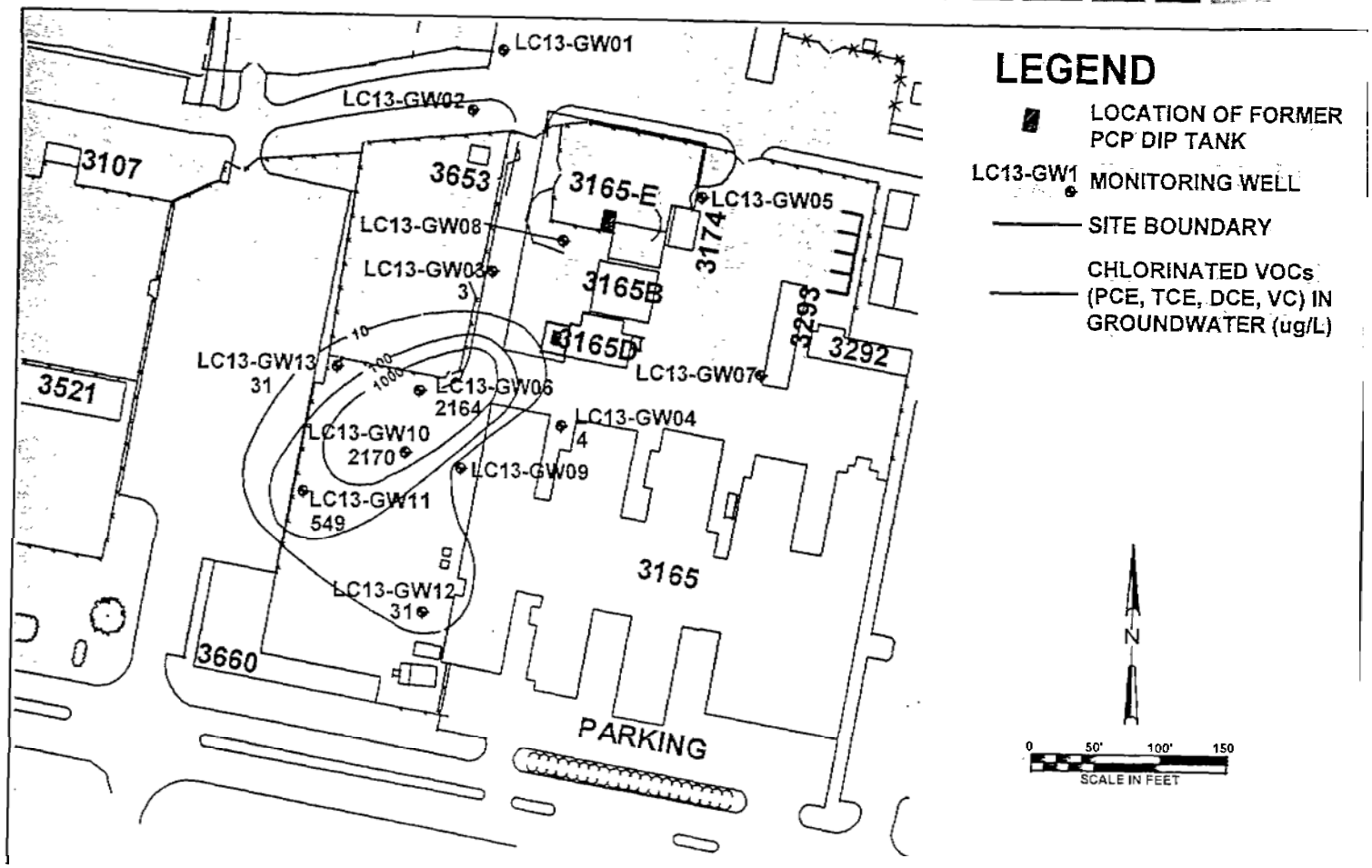
Site 13 - Site Characterization

- Appears to be 2 intermingled groundwater plumes in Columbia Aquifer
  - Pentachlorophenol (PCP) at 2,300 ug/l - from Dip Tank
  - Tetrachloroethene (PCE) and daughter products at 2,200 ug/l - from Wash Rack ?
- Soil contamination (PCP) above water table near former dip tank - possible continuing source to groundwater

Site 13 - PCP in Groundwater



Site 13 - Chlorinated VOCs in GW



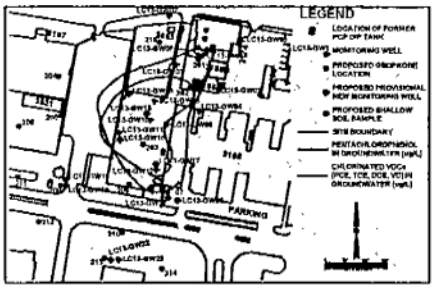
Site 13 - Data Gaps

- Extent of PCP and PCE (et al) in Columbia Aquifer
- Contaminant concentrations in lower portions of Columbia Aquifer
- Hot spot (source area) of PCE
- Natural contaminant-degradation processes occurring in the aquifer

Site 13 - Phase II SRI Approach

- Geoprobe soil investigation to delineate shallow soil contamination near Dip Tank
- Geoprobe groundwater investigation to delineate plume in Columbia Aquifer and identify hot spot (source) of PCE
- Install 10 new wells to monitor plume in Columbia Aquifer
- One round of sampling for contaminants and natural attenuation parameters

Site 13 Future Sampling SRI(2) 1998



Site 13 - EE/CA and Feasibility Study

- Engineering Evaluation/Cost Assessment to evaluate soil remedial/removal options
  - Excavate soil and treat/dispose of off site
  - Excavate soil and treat onsite
  - Treat in place
  - Cap with asphalt
  - Some combination

Site 13 - EE/CA and Feasibility Study

- Focused Feasibility Study (FS) to evaluate groundwater remediation alternatives
  - No action
  - Natural attenuation
  - Insitu treatment (biological, chemical, physical)
  - Extract groundwater and treat
  - Some combination

Site 13 - Schedule

- Phase II SRI field activities - Apr-Jul 1998
- EE/CA for soil - July 1998
- SRI Report for review - Nov 1998
- Soil removal action - FY 1999
- FFS for groundwater - FY 1999
- PRAP and DD for GW- FY 1999
- Design for GW - FY 1999
- Remedial action - FY 2000

Site 13 Future Sampling
SRI(2) 1998