Innovative
Technical
Solutions, Inc.

#3899

September 24, 2001

Port of Oakland
Environmental Health and Safety Compliance Department
530 Water Street, 2nd Floor
Oakland, California 94607
Attn: Mr. John Prall, Associate Environmental Scientist

Replacement Monitoring Well Installation Workplan
2277 Seventh Street
Oakland, California

Dear Mr. Prall,

This Replacement Monitoring Well Installation Workplan has been prepared by Innovative Technical Solutions, Inc. (ITSI) on behalf of the Port of Oakland's Environmental Health and Safety Compliance (EH&SC) Department in compliance with a request made by the Alameda County Environmental Health Services Department (Alameda County)[1]. This groundwater monitoring well is the replacement well for down-gradient monitoring well MW-8, which was abandoned in April 2000 to make way for Port of Oakland Vision 2000 improvements in the immediate vicinity. Field activities for installation have been scheduled for October 2, 2001 with development and sampling scheduled for October 5, 2001.

The scope of work includes installation, development, and groundwater sampling of the replacement well, MW8A, at 2277 Seventh Street in Oakland, California (Figure 1). The replacement well will be installed approximately five to ten feet away from the original MW-8 well location (Figure 2). Actual well location will be determined after a utility clearance of area has been conducted. The replacement well will be constructed similar to the original monitoring well that it is replacing (Figure 3). The following describes the procedures for installation, development and groundwater sample collection. A permit for well installation attained from the Alameda County Public Works Agency is attached as Appendix A. Example Field Forms are presented in Appendix B. The Site-Specific Health and Safety Plan for field activities is presented in Appendix C.

[1] Letter to John Prall, Port of Oakland, EH&SC from Barney Chan, Alameda County dated August 20, 2001 regarding 2225 and 2277 Seventh Street UST Sites, Oakland, CA 94607.

2730 Shadelands Drive, Suite 100
Walnut Creek, CA 94598

(925) 946-3100
fax (925) 256-8998
www.itsi.com

GROUNDWATER MONITORING WELL INSTALLATION

Prior to drilling activities, Underground Service Alert (USA) notification will be made and a utility clearance of the immediate vicinity will be conducted by a private utility locator. In addition, the Port's 2277 Seventh Street tenant will also be notified through the Port Wharfinger of pending field activities.

The borehole will be drilled using a hollow stem auger rig and extend to a maximum depth of 20 feet below ground surface (bgs) with a minimum diameter of 6 inches. The lithology will be logged from the drill cuttings and any odors, staining or gross contamination will be noted.

The replacement monitoring well will be constructed, similar to MW-8, with a 2-inch diameter Schedule 40 PVC casing consisting of approximately 9 feet of 0.010-inch slotted casing from the bottom of the borehole and 8 feet of solid casing from the top of the slotted casing. A bottom plug will be installed at the end of the slotted casing. The annular space surrounding the screened interval will be backfilled with No. 2/12 Lonestar Sand to approximately one foot above the top of the screened interval. This filter pack will be sealed by a minimum one foot of bentonite chips or powder hydrated with approximately 2 gallons of deionized water. After the bentonite seal has been allowed to set, neat cement will be placed above the seal and a flush-mounted traffic-rated utility box installed around the top of the well casing. An expanding, watertight well cap and lock will secure the top of the well casing from surface fluid and tampering.

GROUNDWATER MONITORING WELL DEVELOPMENT AND SAMPLING

The monitoring well will be developed a minimum of 72 hours after well installation to consolidate and stabilize the filter pack, and to optimize well production. Prior to development activities, water level and depth to bottom will be measured and recorded. The location on the top of the casing where the measurements will be collected will be marked for future reference and correlation with future well survey activities. The well will be developed by alternately using a surge block and bailer to remove water and sediment. A maximum of 10 well volumes will be removed during development. Purged groundwater will be placed in appropriately

labeled UN-approved 55-gallon drums and stored on-site for disposal through the Port's disposal contractor.

After well development is completed, a groundwater level and depth to bottom measurements will be collected and recorded on the field sample collection log. When the well has recovered approximately 80% of its water, a groundwater sample will then be collected using a disposal bailer equipped with a bottom emptying devise for transfer into laboratory-provided containers.

Samples will be collected for the following chemical analyses on a normal turnaround time basis:

- Total petroleum hydrocarbons (TPH) as gasoline by EPA Method SW8015 modified
- TPH as diesel by EPA Method SW8015 modified with silica-gel cleanup
- TPH as motor oil by EPA Method SW8015 modified with silica-gel cleanup and,
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl t-butyl ether (MTBE) by EPA Method SW8021B. ✓ if present & if confirmation needed.

Groundwater parameters (temperature, pH, and conductivity) will also be recorded during sample collection. Samples will be delivered under chain-of-custody to Sequoia Analytical (a California certified analytical laboratory) in Walnut Creek, California.

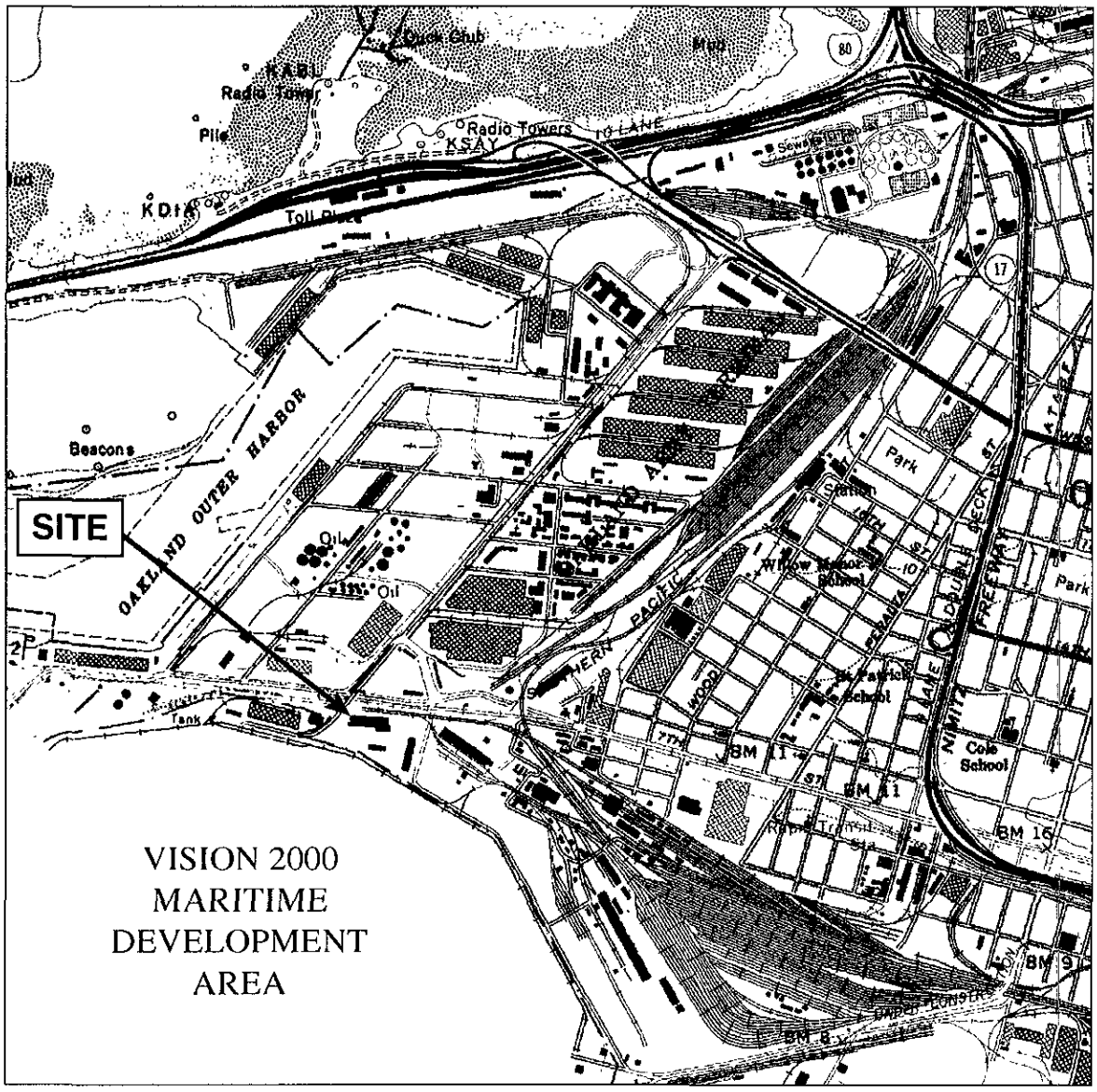
Copies of analytical results, field documentation, and well completion report will be provided to the Port after receipt of analytical results.

If you have any questions or comments, please contact me at (925) 946-3105.

Sincerely,

Rachel B. Hess
Project Manager

cc: B. Chan, Envi Health Services, Alameda County, 1131 Harbor Bay Parkway, Suite 250, Alameda, CA 94502
M. Heffes, Port Legal Department, 530 Water Street, Oakland, CA 94604
J. Hess (ITSI)



N

0 2,000 Feet 4,000 Feet

Approximate Scale

Source: Oakland West 7.5-minute U.S.G.S. Quadrangle, dated 1959, and photorevised in 1980.

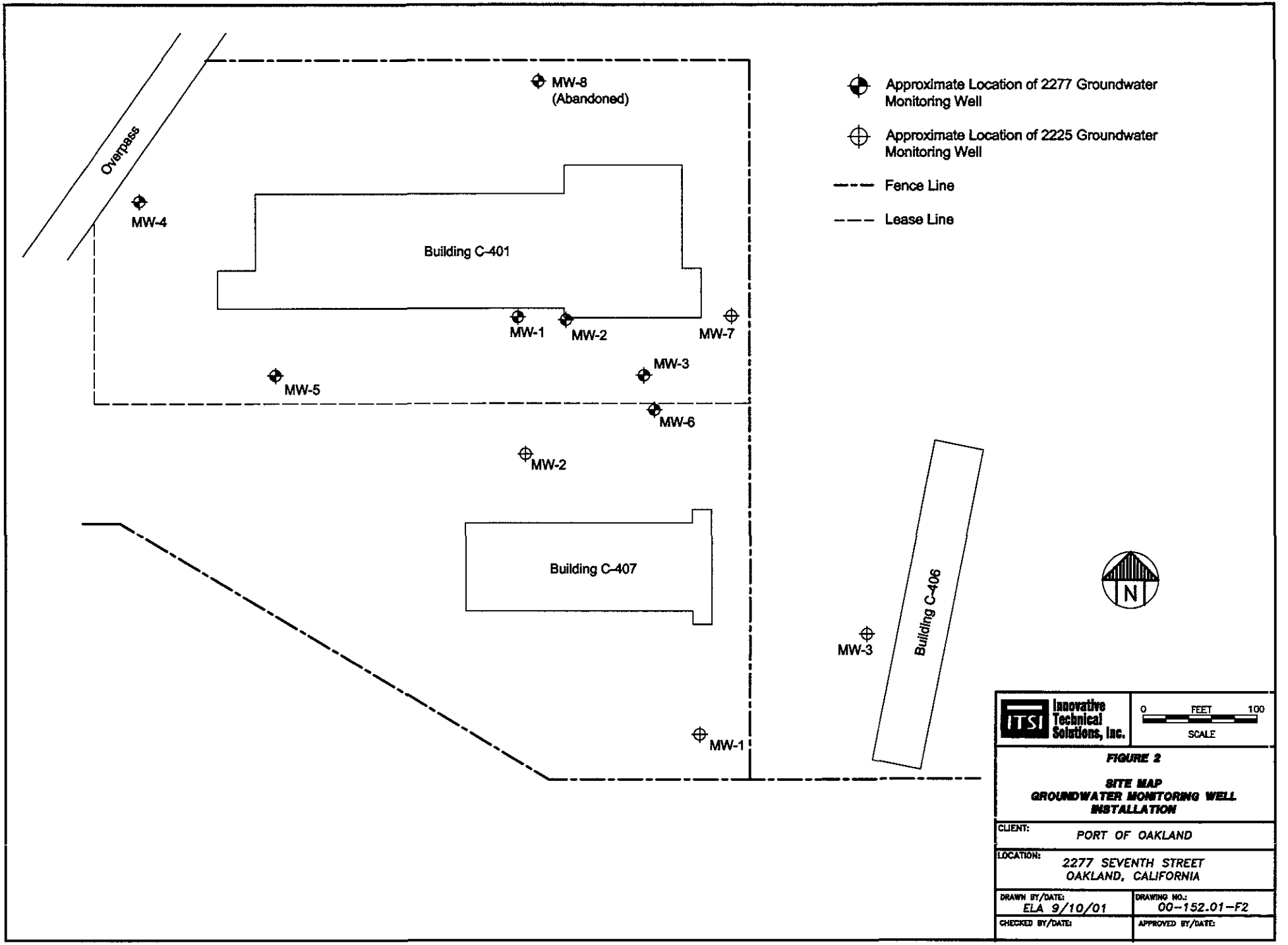
FIGURE 1

SITE LOCATION
Groundwater Monitoring Well Installation

2277 Seventh Street
Oakland, California

PORT OF OAKLAND

ITSI Innovative Technical Solutions, Inc.

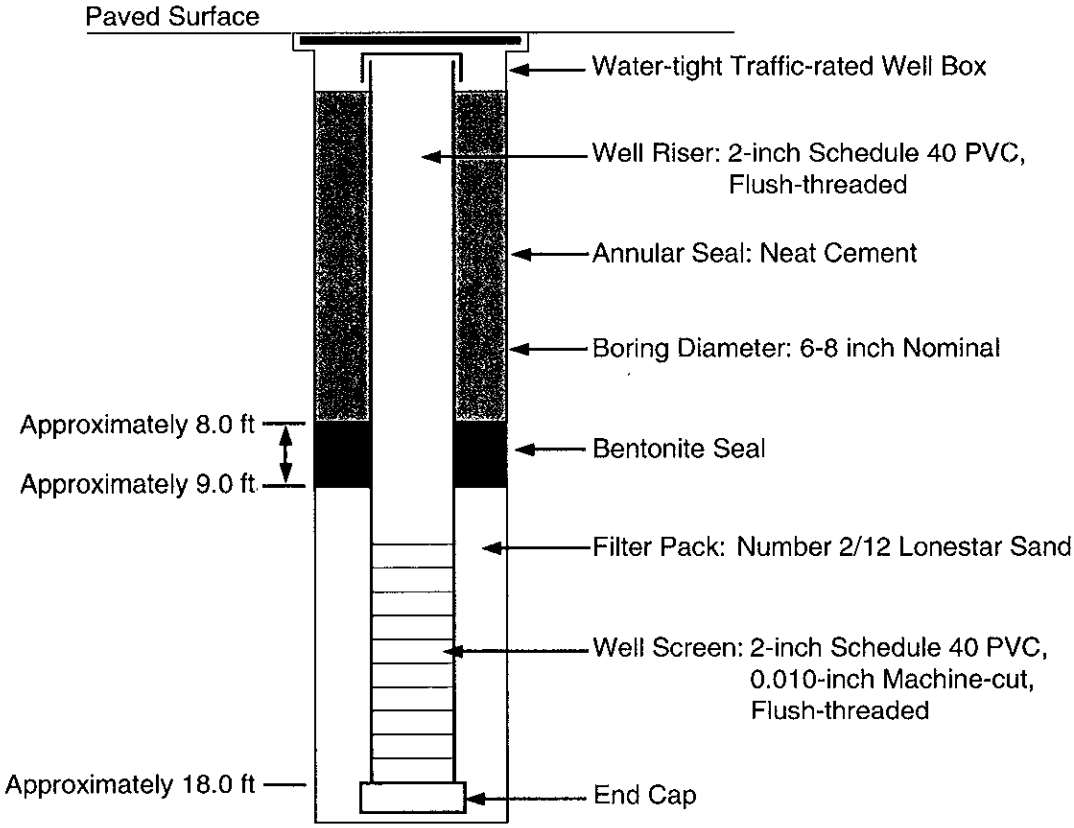


ITSI Innovative Technical Solutions, Inc.	0 FEET 100 SCALE

FIGURE 2

SITE MAP
GROUNDWATER MONITORING WELL INSTALLATION

CLIENT: PORT OF OAKLAND	
LOCATION: 2277 SEVENTH STREET OAKLAND, CALIFORNIA	
DRAWN BY/DATE: ELA 9/10/01	DRAWING NO.: 00-152.01-F2
CHECKED BY/DATE:	APPROVED BY/DATE:



Drawing Not to Scale

ITSI Innovative Technical Solutions, Inc.	**Port of Oakland** 2277 Seventh Street Oakland, California	**Figure 3** Groundwater Monitoring Well (MW) Specifications 00-152.01 MW Spec

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-5554
FAX (510)782-1939

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 2277 - 7th Street, Oakland
Well to be installed approx 80ft north of Building C401 (see attached map)

CLIENT
Name Port of Oakland - EH&SC dept.
Address 530 WATER ST Phone 5106271373
City Oakland CA Zip 94607

APPLICANT
Name Innovative Technical Solutions, Inc.
Address 2730 Shadelands, Ste 100 Phone 9259463105 Fax 9252568998
City Walnut Creek CA Zip 94598

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	0	General	0
Water Supply	0	Contamination	0
Monitoring	X	Well Destruction	0

PROPOSED WATER SUPPLY WELL USE

New Domestic	0	Replacement Domestic	0
Municipal	0	Irrigation	0
Industrial	0	Other	

DRILLING METHOD:

Mud Rotary	0	Air Rotary	0	Auger	X
Cable	0	Other	0		

DRILLER'S NAME Precision

DRILLER'S LICENSE NO. (C57) 636387

WELL PROJECTS
Drill Hole Diameter 6"-8" in. Maximum
Casing Diameter 2" in. Depth 20 ft.
Surface Seal Depth 5 ft. Owner's Well Number MW6A

GEOTECHNICAL PROJECTS NONE
Number of Borings _____ Maximum
Hole Diameter _____ in. Depth _____ ft.

ESTIMATED STARTING DATE Sept. 19, 2001
ESTIMATED COMPLETION DATE Sept. 19, 2001

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Rachel B Hess DATE 9/5/01

PLEASE PRINT NAME RACHEL B HESS

Rev. 5-13-00

FOR OFFICE USE

PERMIT NUMBER #W01-821
WELL NUMBER _____
APN _____

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole anode zone with concrete placed by tremie.

F. WELL DESTRUCTION
Send a map of work site. A separate permit is required for wells deeper than 45 feet.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED _____ DATE 9-5-01

ITSI Innovative Technical Solutions, Inc.

1730 Franklin Street, Suite 301
Oakland, California 94612
(510) 286-8888 (Tel), (510) 286-8889 (Fax)

PROJECT NAME:
PROJECT NUMBER:
SITE LOCATION

DAILY ACTIVITY REPORT

DATE:
PAGE OF

TIME	DESCRIPTION OF FIELD ACTIVITIES AND EVENTS

REFERENCE SKETCH

PREPARED BY:
DATE:
CHECKED BY*
DATE:

DISTRIBUTION:

PREPARERS SIGNATURE:

REVIEWERS SIGNATURE:

* *Not appropriate for a field activity report when only one responsible person is in the field*

PROJECT _____ LOGGED BY _____ **BORING NO.** _____

PROJECT NUMBER _____ DATE DRILLED _____ SHEET _____ OF _____

LOCATION _____ TOTAL DEPTH _____

SURFACE ELEVATION _____ BORING DIAMETER _____

DRILLING COMPANY _____

DRILLING METHOD _____

BORING LOCATION

Depth (Feet)	Sample Interval	Blow Counts	PID (ppm) B-zone/stem/sample	Water Level	Well Construction	Lithology / USCS	DESCRIPTION
5							
10							
15							
20							
25							
30							

CASING DIAMETER _____ CASING LENGTH _____ FROM _____ TO _____

SCREEN SIZE _____ SCREEN LENGTH _____ FROM _____ TO _____

SAND TYPE _____ FROM _____ TO _____

BENTONITE TYPE _____ FROM _____ TO _____

CEMENT/GROUT _____ FROM _____ TO _____

ITSI Innovative Technical Solutions, Inc.

Innovative Technical Solutions, Inc.

Sheet ___ of ___

MONITORING WELL DEVELOPMENT AND SAMPLING FORM

Project Name: _____ Project No.: _____

Well No.: _____ Tested By: _____ Date: _____

Measuring Point Description: _____ Total Well Depth (ft.): _____

Water Level Measurement Method: _____ Sample Method: _____

Development Method(s): _____ Time Sampled: _____

Time Start Develop: _____ Sample Depth (ft): _____

Time End Develop: _____ Field Filtering: _____

Initial/Static Water Level (ft.): _____ Field Preservation: _____

Final Water Level (ft.): _____ Comments: _____

Well Volume Calculation	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in)			=	Casing Volume (gal)	
							2	4	6			
							0.16	0.64	1.44			
Time												
Depth to water												
Volume purged (gals)												
Σ volume purged (gals)												
Σ casing volumes												
Purge rate (gpm)												
Temperature (F°/C°)												
pH												
Specific conductivity (µmhos/cm)												
Dissolved oxygen (mg/L)												
Turbidity or Color												
Odor?												
De-watered?												

Innovative Technical Solutions, Inc.
2855 Mitchell Drive, Suite 111
Walnut Creek, California 94598
(925) 256-8898 – (925) 256-8998 (fax)

Chain-Of-Custody

Project Name and Number: _____ Laboratory Name: _____ Date: _____

Project Manager: _____ Address: _____ Contact Name: _____ Page: ____ of ____

Site Location: _____ Phone: _____

Sample I.D.	Sample Depth	Date	Time	No. of Containers	Sample Matrix	Analysis / Preservative / Container Type:	Special Instructions/Comments

Sampled By: _____

Signature: _____

Special Instructions: _____

_____

_____

Send Results to: _____
(w/fax #) _____

Turnaround Time: _____

Sampler: **Courier/Airbill No.:**

Relinquished By/Affiliation:	Date:	Time:	Received By/Affiliation:	Date:	Time:

Original – Laboratory Yellow – Field/Office

HEALTH AND SAFETY PLAN

GROUNDWATER MONITORING WELL INSTALLATION ACTIVITIES

2277 – 7TH STREET
OAKLAND, CALIFORNIA

Prepared for:

Port of Oakland Environmental Health and Safety Compliance Department
530 Water Street, Oakland, California

Prepared by:

Innovative Technical Solutions, Inc.

September 12, 2001

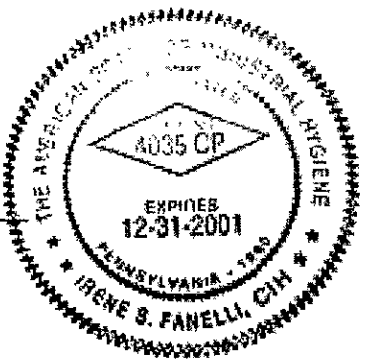
TABLE OF CONTENTS

This Health and Safety Plan addresses the activities to be carried out during installation, development, and sampling of a groundwater monitoring well at 2277 Seventh Street, Oakland, California, Alameda County, California. The plan has been prepared in accordance with 8 CCR 5192 and other applicable regulations, and good industrial hygiene practice.

This plan is intended to apply to the described project activities at the above listed site only, and must not be extrapolated to other substances, work activities or project locations without modification to address the specific hazards associated with those substances, activities and/or any other specific regulatory requirements.

CERTIFICATION OF HAZARD ASSESSMENT

A Hazard Assessment in accordance with 29 CFR 1910.132 has been made to determine the likelihood of excessive exposure to site chemical contaminants. All of the materials are present in low, part per billion, concentrations. Given the scope of work for the project, the concentrations, the degree of potential for exposure to the site materials and prior experience on other sites with similar conditions, there is no expectation that overexposure will occur. As such, exposure monitoring and real-time monitoring are not planned for this project. The exception to this conclusion, and primarily as a precaution, is the change-out of vapor-phase carbon in the treatment system, and handling of condensate in the system. These items are addressed in Section 5.0.



Irene S. Fanelli, CIH

September 12, 2001

Date

1.0 Introduction

This Health and Safety Plan addresses the activities to be carried out during installation, development, and sampling of a groundwater monitoring well at 2277 7th Street, Oakland, California. The plan has been prepared in accordance with 8 CCR 5192 and other applicable regulations, and good industrial hygiene practice.

This plan is intended as a practical approach to the activities in light of the potential occupational and public health hazards. Based upon site history, anticipated chemicals of concern, and site activities, a "Level D" site will be maintained for site activities. As work activities progress, site conditions may change; this Health and Safety Plan outlines the procedures necessary to ensure a safe working environment under the actual conditions which may be encountered. This Plan may be upgraded/downgraded, as appropriate, in light of actual site conditions, after consultation with the consulting Certified Industrial Hygienist (CIH).

This Plan covers all contractors and subcontractors involved in site activities which may involve exposure to soil or groundwater. It serves as a minimum guideline for protective measures. Individual contractors may elect to implement more stringent measures for their own workers. Each contractor will provide health and safety equipment for its employees. All other employers are expected to provide equal or greater levels of protection for their employees.

All site workers directly involved in any contaminated soil disturbing operations will be appropriately trained and certified in accordance with the Cal-OSHA requirements for hazardous waste operations (8 CCR 5192). Soil cuttings and purged groundwater/decontamination water generated during field activities will be containerized in appropriately labeled containers and stored on-site until waste profiling is completed and the wastes are transported off-site for disposal.

All on-site personnel, regulatory agency personnel, and visitors are expected to be familiar with, and comply with the provisions of this Plan.

The site Health and Safety Plan is designed as part of an overall Health and Safety Program or Injury and Illness Prevention Program (IIPP) as specified in 8 CCR 5192 and 8 CCR 3203, respectively. It is specifically intended that this Plan function as the implementation of any Corporate policies and procedures set forth for the various employers involved at the site. If, in any instance, there is a conflict between this Plan and any employer's IIPP, the more stringent requirement shall apply to the work.

2.0 Site Background and Scope of Work

The project site is located at 2277 7th Street, Oakland, in Alameda County, California (Figure 1). The site is an active container transport facility. Monitoring wells were installed by another Port consultant for the assessment of the groundwater quality following the removal of underground storage tanks

from the site in September 1993. One of the monitoring wells, MW-8, was abandoned April 2000 to make way for the Port of Oakland Vision 2000 improvements in the immediate vicinity of the well. The Port committed to installation of a replacement well after the improvements were completed. The location on site for replacement well will be approximately 5 to 10 feet away from the original location shown of Figure 2.

Project activities covered by this plan include: installation and sampling of one groundwater monitoring well.

Well installation will consist of drilling out the borehole to 20 feet below ground surface, installation of slotted and solid two inch well casing with #2 sand filter overlain with a bentonite seal and neat cement surface seal, and installation of a traffic rated utility box around the well casing.

Innovative Technical Solutions, Inc. (ITSI) will perform overall project management, oversight of well installation and development activities, and sample collection. Subcontractors will be used for installation and development of the wells.

3.0 Key Personnel and Responsibilities

On-Site ITSI Project Supervisor/ Health and Safety Officer (HSO): Jim Anderson
The on-site ITSI Project Supervisor will function as the Health and Safety Officer for ITSI employees, and is responsible for oversight of the site activities of ITSI employees, including handling of any hazardous materials encountered. He or his designee is directly responsible for implementation of, and compliance of the company's personnel with, this health and safety plan, and will act as the company's competent person for excavation and as response coordinators in case of an emergency.

Each contractor or sub-consultant shall designate an HSO for their company's site activities. Each employer's HSO or their designee will be responsible for performing any required air monitoring on site for their company's employees, and will be responsible for decision making regarding upgrades in respiratory protection of their employees. They will also be responsible for performing daily inspections of their work sites in order to verify that the health and safety of their workers is protected through compliance with the provisions of this plan.

Consulting Certified Industrial Hygienist (CIH):
Irene S. Fanelli, CIH, Environmental Health Consultants, Inc.
The Consulting CIH will review and approve this Plan, will approve all changes to the Plan, and will provide support to the Site Supervisors for questions or problems relating to health and safety concerns at the site.

4.0 Job Hazard Analysis

The following section presents a discussion of the physical and chemical hazards for this project.

4.1 Physical Hazards

The primary physical hazards potentially associated with the site are expected to include:

a. Drilling equipment
b. Noise
c. Buried utilities/overhead power lines
d. Slips/falls
e. Heat Stress

Personnel working most directly with the well installation and development activities will have the greatest chance of encountering these hazards, however all personnel on site will have the possibility of encountering them at one time or another.

4.1.1 Drilling Equipment

Drilling equipment for this project will involve use of an auger drill rig for monitoring well installation. On-site personnel will be made aware of the presence of this equipment and the hazards of working around such equipment. All personnel operating such equipment will be made aware of the presence of other site personnel. Communication between workers and operators will be by line-of-sight, utilizing standard construction hand signals. Backup alarms and rollover protection will be utilized, as appropriate. Only trained and qualified personnel will operate construction equipment. Groundwater samples, collected after hand development of the well, will be handled in accordance with the ITSI SOP for Sample Handling Procedures included in Attachment B.

4.1.2 Noise

Work around heavy equipment always entails the possibility of excessive noise. Based upon monitoring conducted previously at similar construction sites, noise levels typically range from 75 to 95 dBA. Excessive noise can be readily indicated to the workers on site by difficulty in hearing verbal communication at approximately an arm's length away. Drilling activities is expected to produce the greatest noise producing activity on site and may require hearing protection such as earplugs or earmuffs. Where other excessive noise may be encountered, employees will also be provided with hearing protection. If hearing protection is worn properly, it will provide protection sufficient to reduce actual noise exposures to well below the Cal-OSHA Exposure Limit of 90 dBA. ITSI employees participate in a Hearing Conservation Program that is included in the Corporate Health and Safety Program.

4.1.3 Buried Utilities/Overhead Power Lines

Drilling areas will be examined by site personnel or a locator, and utilities will be protected during any ground penetrating activities, if necessary. Underground Service Alert will be provided notice at least

two days prior to the commencement of excavation activities. Protection from overhead power lines will be accomplished by maintenance of safe distances of at least 10 feet at all times. The work area contains conventional telephone and fiber optic phone lines.

4.1.4 Slips and Falls

Good housekeeping will be maintained on site at all times to minimize slip and fall hazards. Debris, supplies, or other materials or equipment that may present a tripping or slipping hazard must be removed or barricaded to prevent potential injury. Although not anticipated for site operations, any personnel who may be exposed to a fall of six feet or greater must have personal fall protection in place as required by OSHA 29 CFR 1926.

4.1.5 Heat Stress

Adverse climate conditions, particularly heat, are an important consideration in planing and conducting site operations. The following are identified as conditions of Heat Stress.

- Heat Cramps - cramping of muscles usually due to excessive sweating and loss of body salts - most often associated with moderate or strenuous physical exercise.
- Heat Rash - a rash produced when working and sweating in hot environments- greatly enhanced by excessive rubbing of clothing or items in direct contact with the skin.
- Heat Exhaustion - Excessive sweating, cool clammy skin, fatigue, weakness, headache, un-coordination nausea, fainting may occur.
- Heat Stroke - a response to heat characterized by extreme high body temperature and failure of the sweating mechanism. Heat Stroke symptoms include Hot Dry Skin, weak rapid pulse, and mental confusion. Unconsciousness may occur. Heat Stroke is considered an immediate, life-threatening emergency for which medical care is urgently needed - Call Emergency medical personnel immediately for assistance.

Preventive measures for Heat Stress include:

- Frequent Rest Periods in a shaded area when heat and/or humidity are high.
- Drinking of non-alcoholic fluids will be encouraged and done outside of exclusion zones. Drinking water and electrolyte replacement drinks (i.e. Gatorade) will be provided, as needed.
- Suitable acclimation periods will be provided for workers to gradually establish their resistance to heat stress.

The use of protective clothing greatly enhances the likelihood of heat stress. When site conditions exceed 70^{o}F, the HSO will monitor the site conditions/work rates, and implement work/rest regimens, if necessary. Personal heat stress monitoring will be implemented as described below, as necessary. To monitor the workers, measurements will be made of their heart rate, with subsequent

adjustments to work schedule:

- Count the wrist pulse during a 30-second period as early as possible in the rest period.
- If the heart rate exceeds 110 beats per minute (BPM) at the beginning of the rest period, shorten the next work cycle by one-third, and keep the rest period at 10 - 15 minutes.
- If the heart rate still exceeds 110 BPM at the next rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 110 BPM at the next rest period, shorten the following work cycle by one-third and keep the rest period the same.

4.2 Chemical Hazards

Chemicals detected in the work area groundwater include volatile organic compounds and total petroleum hydrocarbons. The table below lists toxicological information for the site contaminants:

Chemical	Maximum GW Concentration[1] (micrograms/liter)	Cal/OSHA PEL or TLV	Carcinogen (C) or Reproductive Toxin (R)	Absorbed through skin?
Benzene	740	1 ppm	Yes	Yes
Ethylbenzene	3.4	100 ppm	No	No
Toluene	13	50 ppm	Yes - R	Yes
Xylenes	2.9	100 ppm	No	Yes
MTBE	75	40 ppm	No	No
TPH-gas	3,600	300 ppm	No	Yes
TPH-diesel	41,000	100 ppm	No	Yes
TPH-motor oil	3,000	100 ppm	No	Yes

Notes:

1. Reference: Harding ESE, 2001. *First Quarter of 2001 Quarterly Groundwater Monitoring and Product Recovery Report, 2277 & 2225 Seventh Street, Oakland, CA*. April, 30.
2. Data is taken from Title 8 CCR 5192, the NIOSH Pocket Guide to Chemical Hazards, 1997, and the ACGIH Threshold Limit Values, 2001.
3. The PEL/TLV is the lower of the two values.
4. ppm = parts of contaminant per million parts of air, by volume.
5. mg/m^3 = milligrams of constituent per cubic meter of air.

Routes of exposure to these site chemicals generally occur through inhalation of vapors or contaminated airborne particulate or through ingestion due to poor work practices and/or poor personal hygiene practices. Other potential routes of exposure include injection and absorption. Chemicals identified on site are listed under California's Safe Drinking Water and Toxic Enforcement

Act of 1986 (Proposition 65) as chemicals known to the State of California to cause cancer or reproductive harm. These chemicals are identified in the table above.

Any exposures to the site contaminants are expected to be minimized through proper work practices, personal protective equipment in accordance with ambient air monitoring, and proper personal hygiene. The potential for exposure to the public is considered to be minimal, and the control measures taken will serve to further minimize any exposure. All site personnel will be instructed to report any visual or odor indications of the presence of contamination so that the conditions may be evaluated and appropriate protective measures for the employees may be taken.

5.0 Air Monitoring Plan and Action Levels

Based upon existing site chemicals, continuous direct reading air monitoring is not anticipated during site activities. Organic vapors are not expected to be present from site chemicals of concern. Air monitoring requirements may be changed at the direction of the Project Supervisor/HSO or designee. All site personnel will be advised to be aware of and report any visible or odor indications of the presence of contamination.

If site conditions are found to differ from those described in this plan, the HSO, in conjunction with the consulting CIH, will determine the extent of personal exposure monitoring necessary during site operations. Subcontractors will be required to perform personal exposure monitoring for their own personnel on site when necessary. Site personnel will be advised to use respiratory protection at their own discretion based upon odor, irritation, or other subjective indications.

6.0 Personnel Protection

The following section presents requirements for personnel protection.

6.1 Protective Equipment

The minimum level of protection for personnel working on site includes:

Hardhat	Work gloves
Steel-toed boots	Workclothes
Safety glasses	

During sampling and other activities where skin contact is a potential exposure mechanism, nitrile, gloves will be utilized.

Chemical goggles/safety glasses will be worn to prevent eye contact via splash or dust, as necessary.

Hearing protection, when required, will consist of the worker's choice of earplugs or earmuffs. In addition, workers will be instructed to utilize hearing protection whenever normal conversation at

approximately three feet or arm's length becomes difficult due to work area noise levels.

The use of respiratory protection is not anticipated during site activities. Respiratory protection may be used upon request of on-site personnel. If the HSO determines that site conditions have changed to warrant respiratory protection as described in Section 5.0, site operations will discontinue and the operations/situation will be evaluated.

7.0 Work Zones and Site Security

The following section presents work zone designations and site security.

7.1 Exclusion Zone

The active work area during drilling will be considered the Exclusion Zone. The Exclusion Zone will be modified, as necessary, as subsurface work is started and/or completed. Traffic cones and/or warning tape will demarcate the area. Access to these zones will be limited to authorized personnel with the appropriate protective equipment, who have met the training and medical requirements appropriate for their level of work effort and protection. All drilling will stop if unauthorized personnel enter the area and not resume until those individuals have left.

7.2 Decontamination and Support Area

Due to the size and short duration of this project, the decontamination and support areas will be combined and located adjacent to the exclusion zone and out of the way of site traffic.

7.3 Site Security

The site is an active container transport/trucking facility and general site security is provided by the on-site tenant. Project specific security around the immediate work area will be conducted as described above in Section 7.1.

8.0 Decontamination Procedures

The following section describes decontamination procedures for the project.

8.1 Personal Decontamination

All disposable clothing, if used, will be deposited in containers on-site for off-site disposal. Wash tubs with soap and water and rinse tubs may be provided for decontamination of gloves if reused. Soap and water or other means will be available for personnel to wash up after work or if any skin

contact occurs during the workday.

8.2 Equipment Decontamination

Any equipment that comes in contact with contaminated materials will be properly cleaned before leaving the site. Augers will be steam cleaned using a self-contained steam-cleaning unit. Attachment C presents the standard operating procedures for steam cleaning as well as general decontamination procedures. Smaller pieces of equipment may be washed in the same manner as contaminated personal protective equipment, i.e., with a brush and soapy water and rinse water.

8.3 Decontamination Materials

All decontamination water will be collected for disposal to a proper disposal site. Contaminated gloves and other contaminated disposable equipment will be collected and disposed of at an appropriate site.

9.0 General Site Safety Provisions

The following section presents general site safety work rules.

9.1 General Site Health and Safety and Work Rules

1. No consumption of alcoholic beverages or illegal drugs will be allowed on-site. Anyone reporting to work under the influence of alcohol and/or illegal drugs will be subject to disciplinary action. Any employee under a physician's care and/or taking prescribed narcotics must notify the Project Supervisor.

2. Personal protective equipment is required in designated areas. Such equipment may include, but is not limited to, respiratory protection, earplugs/earmuffs, hardhat, Tyvek coveralls, boots, gloves, chemical goggles, safety glasses, and protective faceshields.

3. Eating, drinking, smoking, and chewing gum or tobacco is allowed only in designated areas in the Support Zone.

4. Changes in work practices or work rules will be implemented only after approval by the project supervisor.

5. Construction equipment always has the right-of-way over regular vehicles.

6. All employees entering the Exclusion Zone must complete the required decontamination procedure before leaving the site.

7. All protective clothing to be worn inside the Exclusion Zone will be supplied. None of this clothing will be permitted to leave the site with any employee for personal use. Also, any equipment to be used elsewhere for another project will be fully decontaminated before leaving the site.

8. Employees shall listen for warning signals on construction equipment and shall yield to construction equipment.

9. All equipment operators shall pay deliberate attention to watching for workers on the ground who may be in their path and provide these people with warning before moving.

10. All workers shall follow emergency procedures explicitly.

11. Kneeling and/or sitting directly on the ground in the Exclusion Area is prohibited.

3. All employees will utilize a buddy system while working on site.

9.2 Conditions of Site Access to the Exclusion Zone

1. All personnel must meet the medical monitoring requirements of 29 CFR 1910.120/8 CCR 5192 and 8 CCR 5144 and described in Section 12.0. Failure to submit to, or pass, any exam will be grounds for excluding the employee from the site.

2. All employees must participate in the air quality exposure-monitoring program by wearing the personal monitors or sampling devices designated by the HSO. Any employee refusing to participate in the program, or tampering with a sample, will be subject to disciplinary action.

3. No beards or long sideburns will be allowed by personnel utilizing respiratory protection since they interfere with the seal of the respirator to the face. Trimmed sideburns and mustaches are acceptable. All employees potentially using respirators must report to work clean-.

4. All employees must complete the required training programs prior to starting work at the site.

5. All on-site personnel must wear the prescribed health and safety equipment, and go through the decontamination procedures prior to exiting the site.

10.0 Emergency Procedures

Potential on-site emergencies are expected to be restricted to minor injuries to site personnel. On-site conditions are expected to be within the limits of measures that can be taken by on-site personnel. During any on-site emergency, work activities will cease until the emergency is brought under control.

Directions for the emergency route to the medical center are included in Table 1 and Figure HSP-1. This Table and Figure will be kept on site in site vehicles. A list of the emergency telephone numbers is also included in Table 1, and will also be kept on site near the site telephone. All personnel working on site will be informed of the emergency numbers, emergency routes and activity hazards, and will also be informed of evacuation routes, meeting places, and evacuation warning signals in case of the need for an evacuation. Any spill of contaminated soil/groundwater will be immediately contained and cleaned-up at the time of the spill.

Personnel designated to provide first aid to injured workers will receive training and information as required for bloodborne pathogens. These individuals will be advised of the hazards and modes of transmission of bloodborne pathogens and offered the option to receive the Hepatitis B vaccination series. The site first-aid kits will be outfitted with universal precaution protective gear for prevention of exposure to bloodborne pathogens during treatment of injured workers. Any items which come in contact with blood or other body fluids will be "red bagged" and disposed of as medical waste. Each employer having designed first aid responders on site must maintain their own Bloodborne Pathogens Exposure Control Plan.

11.0 Training

All on-site personnel working in the Exclusion Zone will have the appropriate prior experience and training, in compliance with 29 CFR 1910.120 and 8 CCR 5192. Such training includes the 40-hour basic training, three days of supervised field experience, 8-hour update training, 8-hour supervisory training, as appropriate.

A project-specific training session will be provided prior to startup of on-site activities. This training will include:

a. Site health and safety plan
b. Decontamination
c. Personal protection levels
d. Potential chemical hazards
e. Physical hazards
f. Medical monitoring
g. Air monitoring
h. Use and maintenance of personal protective equipment
i. Work zones
j. Site safety rules and conditions of employment
k. Emergency provisions
l. Buddy system

On-site tailgate meetings will be held before each workday to reinforce pertinent topics from the above list and to anticipate problems that may arise during the day. The Project Supervisor will conduct

these meetings for their respective crews. These meetings may be combined into a single meeting in order to aid coordination between the contractors. This training will be documented as part of the daily documentation for the site.

12.0 Medical Monitoring

All on-site personnel who will have potential exposure to the site contaminants will participate in a medical monitoring program. Any site personnel and visitors who have not received medical clearance must be excluded from the active work areas.

For those employees regularly working in the Exclusion Zone, the monitoring program will consist of either a corporate annual physical examination or a pre-employment physical (if the employee was hired specifically for this job which includes:

a. Medical history
b. Physical exam
c. Pulmonary function test
d. Audiogram
e. Blood chemistry
f. CBC with differential and platelets
g. Urinalysis with dipstick and microscopic morphology

For those employees who work infrequently in the Exclusion Zone (i.e. site visitors and those needing only occasional access) and/or who may be expected to use respirators, the medical exam will be that which the examining physician determines is sufficient for clearance to use respiratory protection.

Employees not directly involved with the excavation and sampling activities are not subject to the medical monitoring requirements.

13.0 Documentation

Documentation of each employee's compliance with the training and medical monitoring requirements, and their signature indicating they have reviewed and will comply with this Health and Safety Plan, will be maintained at the Corporate Office. In addition, any required permits, copies of tailgate meeting minutes, air monitoring data, and accident reports will be maintained on site.

Table 1
Emergency Route and Emergency Telephone Numbers

Route to Hospital

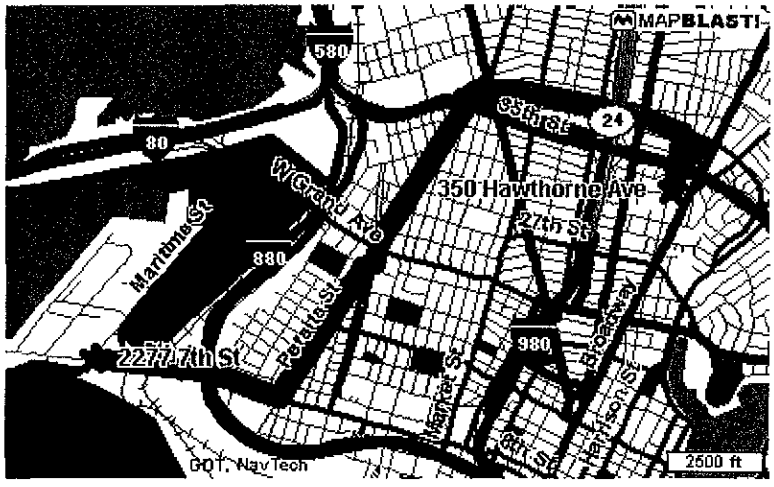
To: Summit Medical Center
350 Hawthorne Ave Oakland, CA 94609-3108
(510) 869-6600

Total Distance: 4.16 miles
1 . Begin at 2277 7th St on 7th St and go East for 0.9 miles
2 . Turn left on Peralta St and go Northeast for 0.8 miles
3 . Turn right on 21st St and go East for 400 feet
4 . Turn left on Mandela Pky and go North for 600 feet
5 . Turn right on Peralta St and go Northeast for 0.9 miles
6 . Turn right on W Macarthur Blvd and go East for 1.1 miles
7 . Turn right on Webster St and go South for 0.3 miles to 350 Hawthorne Ave
See Figure HSP-1 for Hospital Route.

Contact	Phone Number
Police Department	911
Fire Department	911
Hospital: Summit Medical Center, 350 Hawthome Ave, Oakland, CA	(510) 869-6600
Ambulance:	911
Innovative Technical Solutions, Inc.: Corporate Office Jim Anderson, Site Superintendent Cell Phone Rachel Hess, Project Manager Office Phone Cell Phone	(925) 946-3100 (530) 249-2998 (925) 946-3105 (510) 715-7842
Environmental Health Consultants, Inc.: Irene S. Fanelli Office Pager	(650) 347-9205 (888) 881-5128
Port of Oakland Environmental Health & Safety Compliance Department contact: Mr. John Prall	(510) 627-1373
Port of Oakland Wharfinger (Tenant contact): Mr. Jerry Battle	(510) 627-1393 (510) 719-8153

ATTACHMENT A

HOSPITAL ROUTE MAP
AND
SAFETY FIELD FORM



Driving Directions

From: 2277 7th St Oakland, CA 94607-1050

To: Summit Medical Center
350 Hawthorne Ave Oakland, CA 94609-3108
(510) 869-6600

Total Distance: 4.16 miles

1 . Begin at 2277 7th St on 7th St and go East for 0.9 miles
2 . Turn left on Peralta St and go Northeast for 0.8 miles
3 . Turn right on 21st St and go East for 400 feet
4 . Turn left on Mandela Pky and go North for 600 feet
5 . Turn right on Peralta St and go Northeast for 0.9 miles
6 . Turn right on W Macarthur Blvd and go East for 1.1 miles
7 . Turn right on Webster St and go South for 0.3 miles to 350 Hawthorne Ave

FIGURE HSP-1
Hospital Route
Groundwater Monitoring Well Installation
2277 7th Street
Oakland, CA
Port Of Oakland

ITSI Innovative Technical Solutions, Inc.

Innovative Technical Solutions, Inc.

Worker/Visitor Review and Acknowledgement of the Site Safety and Health Plan

Project Name/Job No.: _____
Project Location: _____
Client/Contract No.: _____

I HAVE REVIEWED AND UNDERSTAND THE SITE SAFETY AND HEALTH PLAN FOR THE ABOVE SITE. BY SIGNING BELOW, I ACKNOWLEDGE AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR THIS PROJECT.

Date	Name (Printed)	Company	Signature

ATTACHMENT B

STANDARD OPERATING PROCEDURES FOR SAMPLE HANDLING

SAMPLE HANDLING
STANDARD OPERATING PROCEDURE

1.0 PURPOSE

This procedure defines minimum requirements for safe handling of groundwater, soil and waste samples by all field employees.

2.0 SCOPE

This procedure applies to all samples of contaminated groundwater, soil and waste.

3.0 DEFINITIONS

Sample: Material collected for the sole purpose of analytical testing to determine its composition or hazardous characteristics. Regardless of the hazardous nature of a sample, it **is not** considered a hazardous waste during collection, shipping and analysis. See 40 CFR 261.4(d). However, samples **are** subject to the Department of Transportation (DOT) shipping regulations found in 49 CFR.

4.0 REQUIREMENTS

All samples shall be packaged and shipped in accordance with DOT regulations in 49 CFR 106-180.

Sample preparation and packaging for shipment shall be done at the job site whenever possible. These activities should not occur in office buildings unless each sample is maintained in a sealed container at all times. Sample and hazardous material storage is not permitted in office buildings.

Samples shall not be transported in passenger vehicles unless packaged in appropriate DOT containers. Samples must not be transported in the passenger compartment of the vehicle. Samples should be shipped using methods such as private courier, Federal Express or UPS. Samples that may be hazardous may not be shipped via passenger carriers such as aircraft, trains or buses.

Analytical laboratory contracts and service agreements shall include the requirement for the lab to properly dispose of unused and residual samples without returning these materials to ITSI, unless specifically required by the project contract.

Personnel collecting samples must be adequately trained in proper sampling methods, Chain-of-Custody Documentation, personnel protective equipment, respirators, the hazards of the material to be sampled (if known), DOT shipping requirements and appropriate Quality Assurance/Quality Control (QA/QC) procedures.

ATTACHMENT C

STANDARD OPERATING PROCEDURES FOR DECONTAMINATION MEASURES

DECONTAMINATION MEASURES
STANDARD OPERATING PROCEDURES

1.0 PURPOSE

This procedure describes minimum requirements for preventing the transfer of chemical contamination to uncontaminated materials and personnel. Specific decontamination methods and site work zones will be specified in site health and safety plans.

2.0 SCOPE

This procedure applies to all work sites where employees may come in contact with chemical contaminants. It does not address asbestos abatement, lead abatement or radiological materials. Decontamination requirements for these materials will be covered in separate policies.

3.0 DEFINITIONS

Decontamination: The process of removing or neutralizing contaminants that have accumulated on personnel and equipment. Decontamination methods physically remove contaminants and/or inactivate them by chemical breakdown, neutralization or disinfection/sterilization.

Exclusion Zone: Areas of a field work site that are potentially contaminated with hazardous substances. Access to these zones is restricted to properly trained personnel with appropriate protective clothing, respirators and safety equipment.

Decontamination Zone: Areas of a field work site bordering exclusion zones, where personnel, tools and equipment are cleaned to prevent the spread of contamination into clean work locations. These areas can also be used to store respirators, protective clothing and other safety supplies, as well as first aid kits, fire extinguishers and other emergency equipment. Shower and locker room facilities are located in decontamination zones.

Support Zone: Clean areas of a field work site where no contamination exists. Clean break areas are located in the support zone, as well as necessary office trailers, toilets and drinking water supplies. Access to the support zone is generally unrestricted.

4.0 CONTAMINATION CONTROL

Employees will use the following work practices to prevent or minimize chemical contamination.

- Avoid direct contact with potentially contaminated surfaces whenever possible;
- Limit access to exclusion zone to essential personnel only;
- Lay out traffic patterns and work areas on-site to minimize travel between clean and contaminated areas;
- Enter and exit exclusion zones through the decontamination zone;
- Use tools and heavy equipment to avoid hand and body contact with contaminated materials;
- Use disposable personnel protective equipment (PPE) to minimize the need to clean reusable items;
- Cover potentially-exposed instruments and tools with polyethylene or other protective materials whenever possible.

Field work sites will establish clean, decon and exclusion zones appropriate to the site-specific work operations. Zones will be clearly marked with stakes and caution tape or other appropriate means. Site personnel will be informed of the zone locations and marking system at their initial site safety orientation.

4.2 PERSONAL HYGIENE

As a minimum, personnel decontamination facilities at field work sites must include supplies for hand and face washing upon leaving contaminated work areas.

Employees will wash hands and face prior to eating, chewing, drinking or smoking. Smoking, drinking, eating, chewing tobacco and gum are permitted in designated clean break areas only.

Shower trailers and clean and dirty locker rooms are required for field work sites lasting six months or longer, or where standard field decontamination measures are not sufficient to remove contamination. Potentially contaminated tools and clothing are prohibited in clean locker rooms.

Only potable water will be used for showers and hand or face washing.

5.0 DECONTAMINATION METHODS

Personnel, clothing, equipment, and samples leaving the contaminated areas of a site must be decontaminated to remove any harmful chemicals and biological waste that may have adhered to them.

5.1 PHYSICAL CLEANING

Gross contamination can be removed by physically brushing, scraping, water rinsing, or wiping off surfaces. Cleaning tools, rags and rinse water must be properly containerized for disposal as contaminated waste unless laboratory or field analyses are used to classify these materials in other waste categories.

5.2 CHEMICAL CLEANING AND DISINFECTION

Detergent washing is a more aggressive cleaning method for removal of liquids and solids that stick to contaminated surfaces. Cleaning detergents used for PPE, respirators, hard hats and tools could include, but is not limited to, household laundry or dish soap, trisodium phosphate (TSP), or Alconox™. TSP is caustic and can cause severe skin irritation. Rubber or nitrile gloves and liquid-resistant aprons or coveralls are required to prevent skin contact while cleaning with TSP solutions.

In some instances, diesel oil may be used to remove stubborn petroleum and heating oil contamination. This must be followed by detergent washing to remove the diesel oil.

Solvent rinsing can be used to decontaminate sampling equipment such as split spoon samplers, soil triers and bailers. Solvent rinsing will only be performed in work locations that are at least 75 feet from any potential ignition source. PPE and respirators are required to prevent human exposure to solvent vapors and liquids during this type of decontamination.

Solvent rinsing will not be used for personnel decontamination.

All solvent, diesel, and detergent cleaning wastes and rinse water will be containerized for proper disposal. These wastes will be considered contaminated unless laboratory or field analysis classify them in other waste categories.

5.3 PRESSURE WASHING AND STEAM CLEANING

High-pressure washers and steam cleaners can be used to remove stuck-on materials from vehicles and heavy equipment. These methods are also used in tank cleaning.

Pressure washing and steam cleaning will only be performed by personnel adequately trained in the safe use and maintenance of these devices. These devices can peel paint off surfaces during cleaning and can cause serious injuries if aimed at humans or animals.

Pressure washers and steam cleaners shall not be used for personnel decontamination.

Steam cleaning can build up static charges on surfaces that conduct electricity. Steam cleaning is prohibited with flammable liquids and solids and in any flammable atmosphere.

Pressure washing and steam cleaning activities must be confined to a limited area separate from other vehicle and foot traffic. Screens may be required to prevent overspray and windblown spray during cleaning.

All pressure washing and steam cleaning wastes will be properly containerized for disposal as contaminated wastes unless laboratory or field analysis classify them in other waste categories.

6.0 MEDICAL EMERGENCIES

Whenever possible, contaminated clothing and safety equipment will be removed from injured or ill personnel prior to transporting them to off-site medical facilities. Protective clothing and exposed skin may be decontaminated prior to transport, if time permits and decontamination can be performed without aggravating the victim's injuries.

In the event of eye contact with contaminated materials, clean drinking water or sterile eyewash solutions will be used to flush the exposed eyes for at least 15 minutes. Clean drinking water will also be used to flush skin exposed to contaminated materials.

Employees are prohibited from applying solvents or chemical neutralizing agents to contaminated skin or eyes unless specifically instructed to do so by a National Poison Control Center, paramedic, emergency medical technician, physician or other licensed medical personnel.

7.0 SITE SAFETY AND HEALTH PLANS

Site-specific health and safety plans will include written procedures to prevent the spread of chemical contamination. These procedures must include at least the following:

- Housekeeping requirements for job sites;
- Means of separating clean, decon and exclusion zones at job sites;
- Means of controlling access to decon and exclusion zones;
- Methods for decontaminating personnel, vehicles and equipment when leaving the exclusion zones;
- Handling procedures for contaminated disposable clothing and tools;
- Work practices that minimize the spread of contamination;
- Emergency decon procedures; and
- Provisions for updating decon procedures.

8.0 TRAINING

General decontamination requirements and site zoning are covered in initial 40-hour training for new employees assigned to field work. HSOs and site supervisors are responsible for informing employees, visitors and contractors of project-specific decontamination requirements and verifying compliance with those requirements. HSOs will also inspect decontamination activities periodically to verify the effectiveness of specific cleaning methods. Alternative cleaning methods will be implemented, if necessary. Affected personnel will be informed of changes in specific decontamination procedures prior to their implementation.