

**Chevron Environmental  
Management Company**  
6001 Bollinger Canyon Rd, K2236  
P.O. Box 6012  
San Ramon, CA 94583-2324  
Tel 925-842-9559  
Fax 925-842-8370

**Dana Thurman**  
Project Manager

**RECEIVED**

By Ioprojectop at 9:43 am, May 10, 2006

May 9, 2006

(date)

**ChevronTexaco**

Alameda County Health Care Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

Re: Chevron Service Station # 9-6991

Address: 2920 Castro Valley Boulevard, Castro valley, CA

I have reviewed the attached report titled Workplan for Remedial Pilot Test  
and dated May 9, 2006.

I agree with the conclusions and recommendations presented in the referenced report. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Cambria Environmental Technology, Inc., upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,



Dana Thurman  
Project Manager

Enclosure: Report

May 9, 2006

Mr. Barney Chan  
Alameda County Health Care Services Agency  
Department of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502



Re: **Workplan for Remedial Pilot Test**  
Chevron Station #9-6991  
2920 Castro Valley Blvd  
Castro Valley, California

Dear Mr. Chan:

Cambria Environmental Technology, Inc. (Cambria) has prepared this *Workplan for Remedial Pilot Test* on behalf of Chevron Environmental Management Company (Chevron) in order to address remaining hydrocarbons in groundwater. The site background, previous investigations and scope of work are presented below.

## **SITE DESCRIPTION**

The site is located at the northeast corner of Castro Valley Blvd. and Anita Ave. in a commercial area of Castro Valley, California (Figure 1). The site elevation is approximately 170 feet (ft) above mean sea level and the topography slopes gently southward toward South Reservoir, a distance of approximately 3,500 ft. The nearest surface water is an unnamed intermittent creek approximately 1,100 ft west of the site. The underground storage tanks (USTs) were replaced in 1983 and at that time discontinued diesel fuel sales. The service station was remodeled into its current configuration in 1990.

The site is located within the Castro Valley groundwater basin in a valley between ridges of the Diablo Range. The unconfined water-bearing zone lies within unconsolidated alluvial sediments and exhibits a generally southwestward flow direction toward San Francisco Bay. These water-bearing sediments overlie the sedimentary Chico Formation, considered a non-water-producing formation based on its historically poor groundwater yields.

**Cambria  
Environmental  
Technology, Inc.**

2000 Opportunity Drive  
Suite 110  
Roseville, CA 95678  
Tel (916) 677-3407  
Fax (916) 677-3687

Current site features consist of a station building, three double-walled fiberglass USTs, two dispenser islands, and associated piping (Figure 2). The former used-oil UST was located northwest of the current station building and the former gasoline UST was located at the northern

end of the same excavation as the existing USTs. The former dispenser islands were located south of the station building.

## PROPOSED SCOPE OF WORK

In order to address remaining hydrocarbons currently reported in monitoring well MW-7, Cambria proposes a surfactant extraction pilot test. The specific scope of work is discussed below.



**Site Health and Safety Plan:** Cambria will prepare a health and site safety plan and journey management plan to inform site workers of known hazards and to provide health and safety guidance. The plans will be kept on site at all times, and the health and safety plan will be signed daily by all site workers.

## SURFACTANT EXTRACTION PILOT TEST


Cambria will conduct a pilot test utilizing existing monitoring well MW-7 to determine if residual hydrocarbons in the 'smear-zone' can be liberated and recovered through the subsurface application of a non-ionic surfactant and subsequent enhanced vacuum fluid recovery (EVFR). The goal of the treatment is to expedite the removal of residual hydrocarbons, thereby mitigating the source of the dissolved phase concentrations at the site and causing reduction in dissolved concentrations observed in source area monitoring wells.

Potential advantages of surfactant treatment for recovering residual hydrocarbons include:

- Residual hydrocarbons below the water table can be recovered;
- Recovery does not depend on dewatering the smear zone;
- Recovery is not restricted by hydrocarbon volatility or composition, or the thickness of the smear zone; and
- It is potentially an efficient, low cost, short term method to improve recovery.

Surfactants work by decreasing the interfacial surface tension between hydrocarbons and water, creating a micro-emulsion of oil in water. This significantly increases the mobility of the hydrocarbons during water extraction and can significantly enhance its recovery from soil contacted by the surfactant. Ideally, the residual hydrocarbons can be significantly reduced in the soil around the well resulting in significantly reduced dissolved concentrations in groundwater in the treated area.

A typical surfactant solution for remediation would consist of approximately 3 percent surfactant by volume in water. The surfactant we plan to use is Ivey-sol<sup>®</sup> selective phase transfer technology (Ivey-sol<sup>®</sup> SPTT) non-ionic surfactant, which is non-toxic, biodegradable, and is engineered for the specific hydrocarbon ranges impacting the site. A copy of the Ivey-sol<sup>®</sup> SPTT material safety data sheet (MSDS) is presented as Attachment A.



Surfactant will be injected at low pressure or gravity fed via monitoring well MW-7 to contact residual hydrocarbons in the source zone area. The rate of application will be low to minimize outward displacement of hydrocarbons during the surfactant application. The initial amount of surfactant solution to be injected will be based on a calculation of pore volume to reach a radius of at least 10 feet from each test well within the hydrocarbon-bearing soil horizon. The surfactant solution will then be allowed to equilibrate for a period of 24 to 48 hours to envelop and micro-emulsify any residual hydrocarbons in the vicinity of wells. This application will be followed by an EVFR event using a mobile vacuum truck to remove the surfactant solution and liberated hydrocarbons from the source area. During removal, the water will be periodically tested for surfactant and hydrocarbon concentrations in order to qualify the effectiveness of surfactant extraction during the pilot test. Typically, the volume of fluid withdrawn is at least three times the volume of injected surfactant solution. Cambria will repeat the surfactant application and EVFR events two times after the initial event at two-week intervals.

The efficiency of surfactant extraction will be evaluated by comparing pre- and post-treatment hydrocarbon concentrations in the extraction well. Cambria will monitor for the rebound of hydrocarbon concentrations in the extraction well monthly for approximately three months after the pilot test. Cambria will compare pilot test rebound results with pre-treatment data to estimate the impact of surfactant extraction treatment on groundwater in the source area.

**Chemical Analysis:** All groundwater samples will be analyzed for:

- TPHd and TPHg by N. California LUFT Methods, and
- BTEX and MTBE by EPA Method 8260B.

**Reporting:** Upon completion, Cambria will document all field activities and analytical results in a report that, at a minimum, will contain:

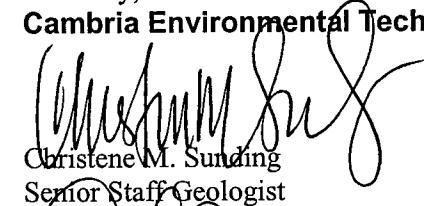
- A brief summary of the site background and history,
- Tabulated pre- and post-treatment hydrocarbon concentrations in groundwater sample analytic results,
- Analytic reports and chain-of-custody forms,
- Soil/water disposal methods,
- A summary of pilot test activities and results,
- A discussion of hydrocarbon distribution at the site, and
- Cambria's conclusions and recommendations.

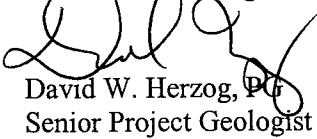


**CLOSING**

Cambria will coordinate and perform the above activities after receiving written approval of this work plan from the ACHCSA. Cambria will submit an investigation report approximately six to eight weeks after completion of field activities. Please contact David Herzog (ext. 112) or Christene Sunding (ext. 109) at (916) 677-3407 (ext 112), if you have any questions or comments.

Sincerely,  
**Cambria Environmental Technology, Inc.**

  
Christene M. Sunding  
Senior Staff Geologist

  
David W. Herzog, PG  
Senior Project Geologist



Figures: 1 – Vicinity map  
2 – Site Map

Attachments: A – Ivey-sol<sup>®</sup> SPTT MSDS

cc: Mr. Dana Thurman, Chevron Environmental Management Company, P.O. Box  
6012, San Ramon, CA 94583  
Cambria File Copy

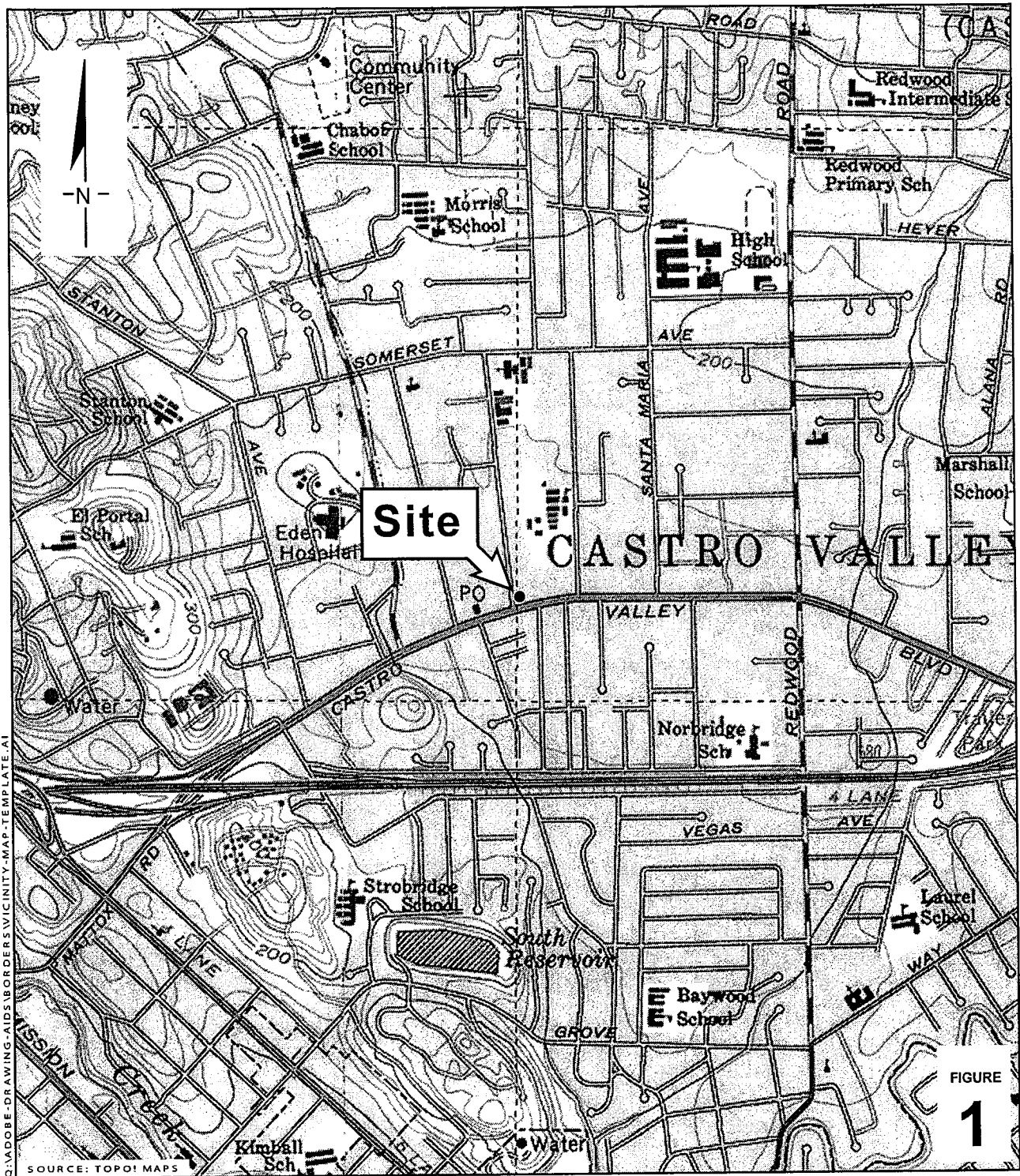
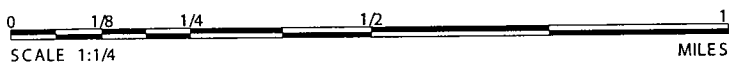


FIGURE 1



**Chevron Service Station 9-6991**  
 2920 Castro Valley Boulevard  
 Castro Valley, California



C A M B R I A

Vicinity Map



**EXPLANATION**

- MW-7 ● Monitoring well location
- SB-5 ● Soil boring location
- Storm Drain
- Water Line
- - - Sanitary Sewer

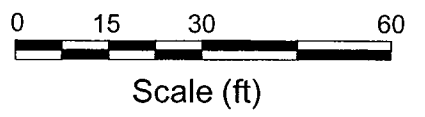
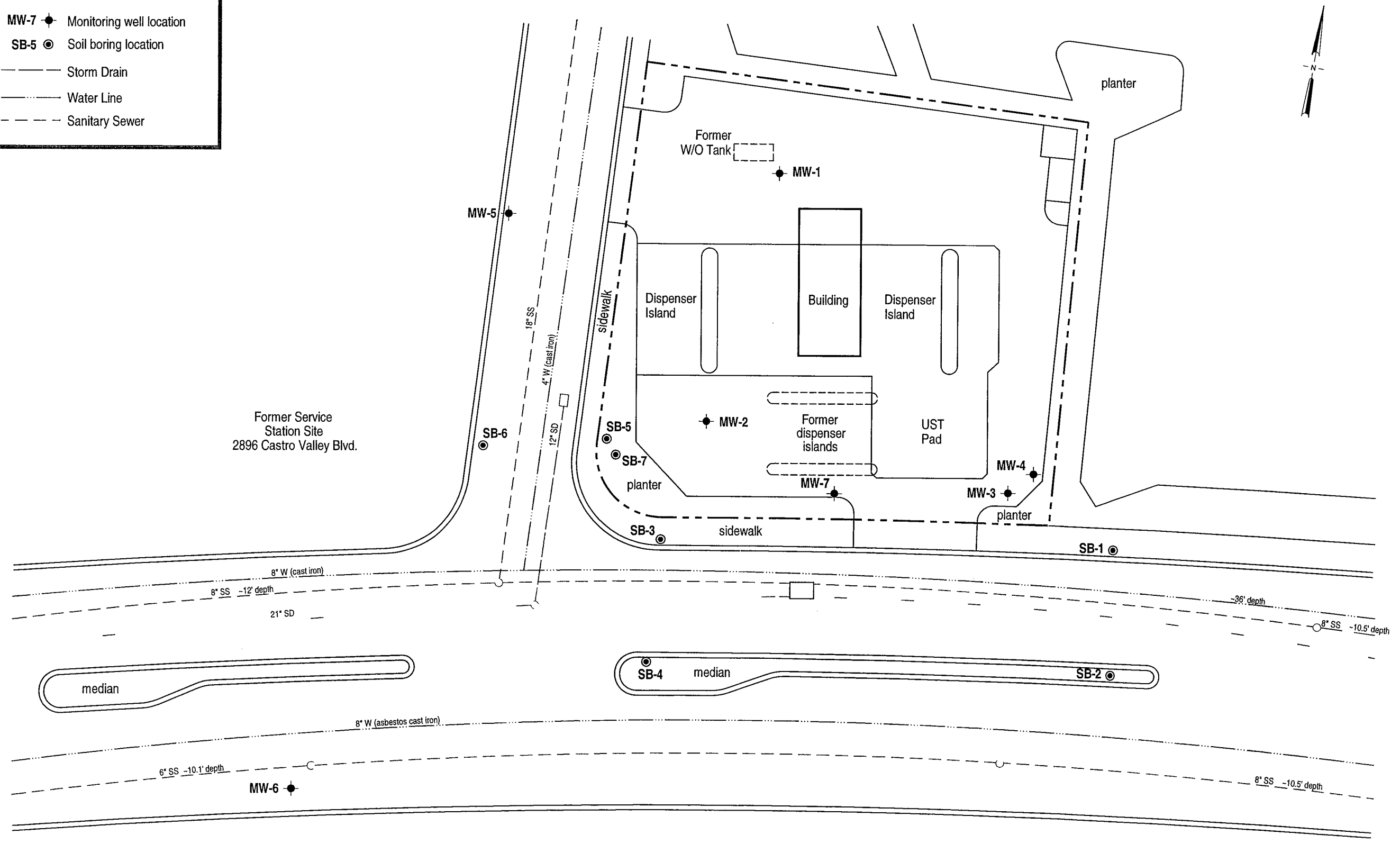


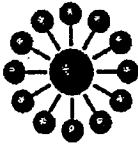
FIGURE  
**2**

I:\9-6991 CASTRO VALLEY\FIGURES\SITEPLAN.DWG

**ATTACHMENT A**

**Ivey-sol<sup>®</sup> SPTT MSDS**





Ivey International Inc.

MSDS NUMBER: 100764/02

## MATERIAL SAFETY DATA SHEET SELECTIVE PHASE TRANSFER TECHNOLOGY

*IVEY-SOL® • Selective Phase Transfer Technology (SPTT®)*

### SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Ivey-sol/SPTT (Stock Mixtures: SPTT#101-104)  
Chemical Name: Not Applicable (mixture)  
Chemical Family: Non-ionic Surfactant  
Formula: Not Applicable (mixture)  
Synonym(s): Ivey-sol® and SPTT®

#### COMPANY IDENTIFICATION

Ivey International (USA) Inc. 26 Berkeley Place, Newington, CT USA 06111  
Ivey International (CAN) Inc. PO Box 706 Campbell River BC Canada V9W 6J3  
Prepared By: Technical Products Department  
Telephone Number: 1-800-246-2744 (Emergency Also)  
Prepared: April 2005 (Last Updated)

Ivey International Inc. (III) urges each customer or receipt of this MSDS to study it carefully to become aware of and understand the proper use and handling of the subject product. The reader should consider consulting reference materials, and/or III technical support personal, and/or other recognized experts, as necessary or appropriate to the use and understanding of the data contained in this MSDS. To promote the safe handling, storage and use of this product, each customer or recipient should (1) notify his employees, agents, contractors, and others whom he knows or believes will use this product, of the information in this MSDS and any other information regarding product use, storage and handling, (2) furnish this same information to each of his customers for the product, and (3) request his customers to notify their employees, customers, and other users of the product, and of this information.

### SECTION 2: COMPOSITION INFORMATION

Components:  
Ivey-sol 101 3% (By-volume)  
Ivey-sol 102 3% (By-volume)  
Ivey-sol 103 3% (By-volume)  
Ivey-sol 104 3% (By-volume)

Ivey-sol® / SPT® Technology - Stock Mixtures. Patented and or proprietary blends. Information in this MSDS is applicable for all component products listed.

### SECTION 3: HAZARDS IDENTIFICATION

#### Effects Of A Single Exposure

Swallowing: Slightly toxic. May cause abdominal discomfort, nausea, vomiting, and diarrhea.  
Skin Absorption: No evidence of harmful effects from available information.  
Inhalation: No evidence of harmful effects from available information.  
Skin Contact: Brief contact should result in not significant effects. Prolong exposure may cause mild irritation with local itching and redness.  
Eye Contact: May cause mild to moderate irritation, experienced as discomfort or pain.  
Effects Of  
Repeated Exposure: Repeated skin contact may cause mild dermatitis.  
Medical Conditions: Existing dermatitis may be aggravated through repeated skin contact.  
Other Effects: None currently known.

#### **Section 4: FIRST AID MEASURES**

Swallowing: If patient is fully conscious, give two glasses of water  
Skin Absorption: Wash with soap and water. Obtain medical attention if irritation or dermatitis persists.  
Wash any exposed clothing before reuse.  
Inhalation: Not applicable.  
Eye Contact: Immediately flush eyes with water and continue to flush as required. Remove any contact lenses, if worn. Obtain medical attention if deemed necessary  
Note To Physician: There is no antidote. Treatment should be directed at the control of symptoms and the clinical condition of the patient.

#### **Section 5: FIRE FIGHTER MEASURES**

Flammability: Not Flammable.  
Auto Ignition Temp. Not Available  
Upper Flammable Limit Not Established  
Lower Flammable Limit Not Established  
Explosive Data: Explosive Power Not Available  
Rate Of Burning Not Available.

Hazardous Combustion Products: Burning can produce the following combustion products: Carbon monoxide, and/or Carbon Dioxide. Carbon monoxide is highly toxic if inhaled; carbon dioxide is sufficient concentrations can act as an asphyxiant.  
Special Protective Equipment: Use self contained breathing apparatus and protective clothing.  
Extinguishing Media: Apply alcohol type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use water spray, carbon dioxide, or dry chemical for small fires.  
Extinguishing Media To Be Avoided: None.  
Special Fire Fighting Procedures: Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity.

#### **Section 6: ACCIDENTAL RELEASE MEASURES**

Step To Be Taken If Material Is Released or Spilled: Eliminate and/or contain source with inert material (sand, earth, absorbent pads, etc.). Wear eye and skin protective. Floor may be slippery; use care to avoid falling. Avoid discharge to natural waters. Transfer liquids and solid diking material to suitable containers for recovery or disposal. Contact III for technical assistance if required.

#### **Section 7: HANDLING AND STORAGE**

Handling Procedures: Avoid contact with eyes, skin, and clothing. Do not swallow. Keep containers closed or sealed when not in use. Wash thoroughly after handling.  
Storage: Keep closed or sealed when not in use. Do not allow to freeze.  
Ventilation: General (mechanical) room ventilation is expected to be satisfactory.

#### **Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

Gloves / Type: Latex would be sufficient.  
Respiratory / Type: None expected to be needed. However, if an engineered / industrial application where vapors and/or misting may occur, wear MSHA/NIOSH approved half mask air purifying respirator.  
Eye / Type: Mono Goggles  
Footwear / Type: No special requirements.  
Clothing / Type: Wear an apron and /or coveralls.  
Other / Type: Eye bath.  
Engineering Controls: General (mechanical) room ventilation is expected to be satisfactory.

### Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Appearance:	Transparent
Odor:	Mild
Molecular Weight:	Mixture (Not Applicable)
Boiling Point:	260 C (Average At 760 mm Hg)
Freezing Point:	Not Applicable
Pour Point:	Not Applicable
Melting Point:	Not Applicable
Specific Gravity:	0.99-1.04 (Water = 1.0)
Vapor Pressure:	<0.01 mm Hg <sup>i</sup>
Vapor Density:	> 1 (Air = 1.00)
Ph:	Not Available
Solubility In Water:	100%
Evaporation Rate:	<0.01
Coefficient of Oil/Water Distribution	Not Determined

### Section 10: STABILITY AND REACTIVITY

Stability:	Stable
Conditions To Avoid:	Prolonged excessive heat may cause product decomposition. Freezing should also be avoided as it may cause product decomposition.
Incompatible Materials:	Normally un-reactive; however avoid strong bases at high temperatures, strong acids, strong oxidizing agents, and materials with reactive hydroxyl compounds.
Hazardous Decomposition Products:	Burning may produce carbon monoxide and/or carbon dioxide.
Hazardous Polymerization:	Will not occur.

### Section 11: TOXICOLOGICAL INFORMATION

Exposure Limit of Material:	Not Established
LD/50:	48 Hour: 0.11 %, Species: Daphnia magna 96 Hour: 0.07695%      Species: Daphnia magna
LC/50:	Not Available      (Route Species)
EL:	Not Established
Carcinogenicity of Material:	None Known
Reproductive Effects:	Not Available.
Irritancy of Material:	See Section 3
Sensitizing Capability:	Not Available
Synergistic Materials:	Not Available

LD: Lethal Dose    LC: Lethal Concentration    EL: Exposure Limit

### Section 12: ECOLOGICAL CONSIDERATIONS

Environmental Toxicity:	Low Potential to affect aquatic organisms*
Biodegradability:	>90% in 28 days**

\* When used in accordance with Ivey International Inc. In-situ and Ex-situ Remediation Application Guidelines.

\*\* Based on actual testing or on data for similar material(s). Degradation Biodegradation reached in Modified OECD Screening Test (OECD Test No.301 E) after 28 days: 90 %. Biodegradation reached in CO2 Evolution Test (Modified Sturm Test, OECD Test No. 301 B) after 28 days: 70 %.

All available ecological data have been taken into account for the development of the hazard and precautionary information contained in this Material safety data Sheet.

**Section 13: DISPOSAL CONSIDERATIONS**

Waste Disposal Method: For aqueous Ivey-sol mixture solutions; aerobic biological wastewater treatment systems are effective in treating said mixtures.

Disposal methods identified are for the product as sold. For proper disposal of used materials, an assessment may be required to determine the proper and permissible waste management option permissible under applicable rules, regulations, and/or laws.

**Section 14: TRANSPORTATION INFORMATION**

UN Number: Not Applicable  
TDG Classification: Not Required  
Shipping Name: Selective Phase Transfer Mixture (Ivey-sol)  
Packing Group: Not Applicable  
Special Shipping Instructions: Do not allow to freeze

**Section 15: REGULATORY INFORMATION**

WHMIS Classification: D2B  
CPR Compliance: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

**Section 16: OTHER INFORMATION**

Available Literature and Brochures: Additional information on this product may be obtained by calling our customer service representative.

Recommended Uses and restrictions: For the application of air, soil, groundwater, shoreline, and off-shore spill petroleum reclamations purposes. Secondary recoveries of petroleum products from crude-oil, oil-shale, and oil-sands. Additional information on uses can be made available by contacting out technical sales director.

Legend: TS - Trade Secret  
D2B - Toxic Material causing Other Effects.  
< - Less Than  
mm - Millimeters  
LD - Lethal Dose  
LC - Lethal Concentration  
EL - Exposure Limit  
Hg - Mercury (760 mm Hg = 1 Atmosphere, Sea Level)

Notes:

i) Revised Sections In This Issue: Section 5: Fire-Fighter Measures  
Section 8: Latex Gloves Sufficient  
Section 1: Trade Mark Registrations ®