

## CITY OF HOUSTON



## PUBLIC WORKS AND ENGINEERING PLANNING & DEVELOPMENT DIVISION

### EXECUTIVE SUMMARY

#### *Project Overview*

InControl Technologies, Inc. was retained by The Shops at Shepherd, Ltd. to provide environmental consulting services at the Eco Cleaners located at 2620 S. Shepherd Dr., Houston, Harris County, Texas. The subject property (the Site) consists of one strip shopping center totaling 0.3444-acres of land located southwest of downtown Houston, Harris County, Texas (**Figure C1**). The surrounding area is a mix of residential and commercial development (**Figure B**).

The subject property is located on the border of the Brays Bayou and Buffalo Bayou watersheds (**Figure C2**) and the property is not located within the 100-year floodplain (**Figure C3**).

A volatile organic compound (VOC) Protective Concentration Level (PCL) Exceedance (PCLE) zone was identified at the subject property. The PCLE zones are depicted on **Figure C4-1** through **Figure C4-3**.

#### *Historical Environmental Condition*

Eco Cleaners operated on-site tetrachloroethene (PCE) dry cleaning operations from December 1, 1991 to October 2000. Since that time, Eco Cleaners has converted from tetrachloroethene to Stoddard Solvent usage. Eco Cleaners' current unit produces a solvent/water stream which passes through a solvent/water separator. The water that is separated from the solvent is collected in 5-gallon buckets and then placed in an evaporative cooler.

InControl Technologies' initial assessment, which consisted of two hand auger borings advanced next to the dry cleaning equipment and two soil borings that were completed into the groundwater bearing unit, identified the presence of PCE and its breakdown products in both soil and groundwater. Following this assessment, the Site was enrolled in the Texas Commission on Environmental Quality (TCEQ) Voluntary Cleanup Program (VCP) in November 2013. Based on the initial information, InControl Technologies installed seven groundwater monitoring wells to help define groundwater gradient and the potential extent of dry cleaners related impacts in shallow groundwater.

The area of affected groundwater is not fully delineated to the east (**Figure C4-2**). InControl Technologies attempted to install a delineation well on the shopping center property to the east across S. Shepherd, but was denied access to that property. After several months of negotiations with the property owner, InControl Technologies still was denied access to the property. Included in **Appendix D** is the letter denying access to the property.

In the western delineation well (MW-6), chemical of concern (COC) concentrations slightly exceed the Tier 1 <sup>GW</sup>GW<sub>ing</sub> PCL. At this time, it is impractical to further delineate to the west since the next alternative place to install a delineation well in that direction is the next street over (Persa Street). This would place the well approximately 235-ft west of MW-6. At this point, linear extrapolation indicates that the concentrations in a Persa Street delineation well would fall below the Tier 1 groundwater ingestion (<sup>GW</sup>GW<sub>ing</sub>) PCL. With that in mind, and given that the concentrations of PCE in MW-6 just slightly exceed the PCL, it is our opinion that MW-6 provides adequate delineation at this time.

Monitoring wells MW-1 and MW-2 report dry cleaner related compounds in groundwater at concentrations greater than the applicable Tier 1 <sup>GW</sup>GW<sub>ing</sub> PCLs. The PCLE zones are depicted in **Figures C4-1** through **C4-3**. The direction of groundwater flow is toward the northwest (**Figure C7**).

InControl Technologies' drinking water well survey identified three (3) water wells within a ½-mile radius of the proposed MSD boundary (**Appendix P**). Map ID #1 is located at the Admiral Linen Co. approximately 0.130 miles southeast of the site. This well is actively being used. Map ID #2 and #3 are believed to be the same well, located at the Preston Villa Apartments approximately 0.250 miles southwest of the site. InControl identified this well during the field survey. None of these wells are affected or potentially affected by the groundwater contamination from the subject property. All of the wells are completed at depths greater than 400-ft, which is much deeper than the limit of impacted groundwater associated with the proposed MSD area.

Buffalo Bayou is located approximately 1.36-miles north (down gradient) of the proposed Municipal Setting Designation (MSD) boundary. Due to the distance from this water body to the proposed MSD area, the bayou is not directly threatened by natural movement of the affected groundwater identified on the site (**Figure C2**).

## Appendix A

Provide a legal description of the boundaries of the designated property, including metes and bounds, and a copy of the deed for the property. A professional surveyor currently registered with the Texas Board of Professional Surveying must certify that all property descriptions with metes and bounds are accurate.

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The legal description plus a metes and bounds description for the designated property is included in this section.

**Figure A** is the proposed MSD boundary at Eco Cleaners, located at 2620 S. Shepherd in Houston, Texas.

A TRACT OR PARCEL OF LAND CONTAINING 15,000 SQ. FT. OR 0.3444 ACRE BEING ALL OF LOTS 8, 9, AND 10, BLOCK 1 OF "RENE SU COURT" ADDITION OUT OF THE OBEDIENCE SMITH SURVEY ABSTRACT 696, HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 572, PAGE 38 OF THE HARRIS COUNTY DEED RECORDS, SAID 0.3444 ACRE TRACT BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS TO-WIT:

Commencing for reference at a 5/8 inch iron rod marking the intersection of the South right-of-way line of Westhimer Road and the West right-of-way line of South Shepard Dr. and the Northeast corner of said Block 1 as delineated on plat recorded in Volume 572 Page 30 of the Harris County Deed Records;

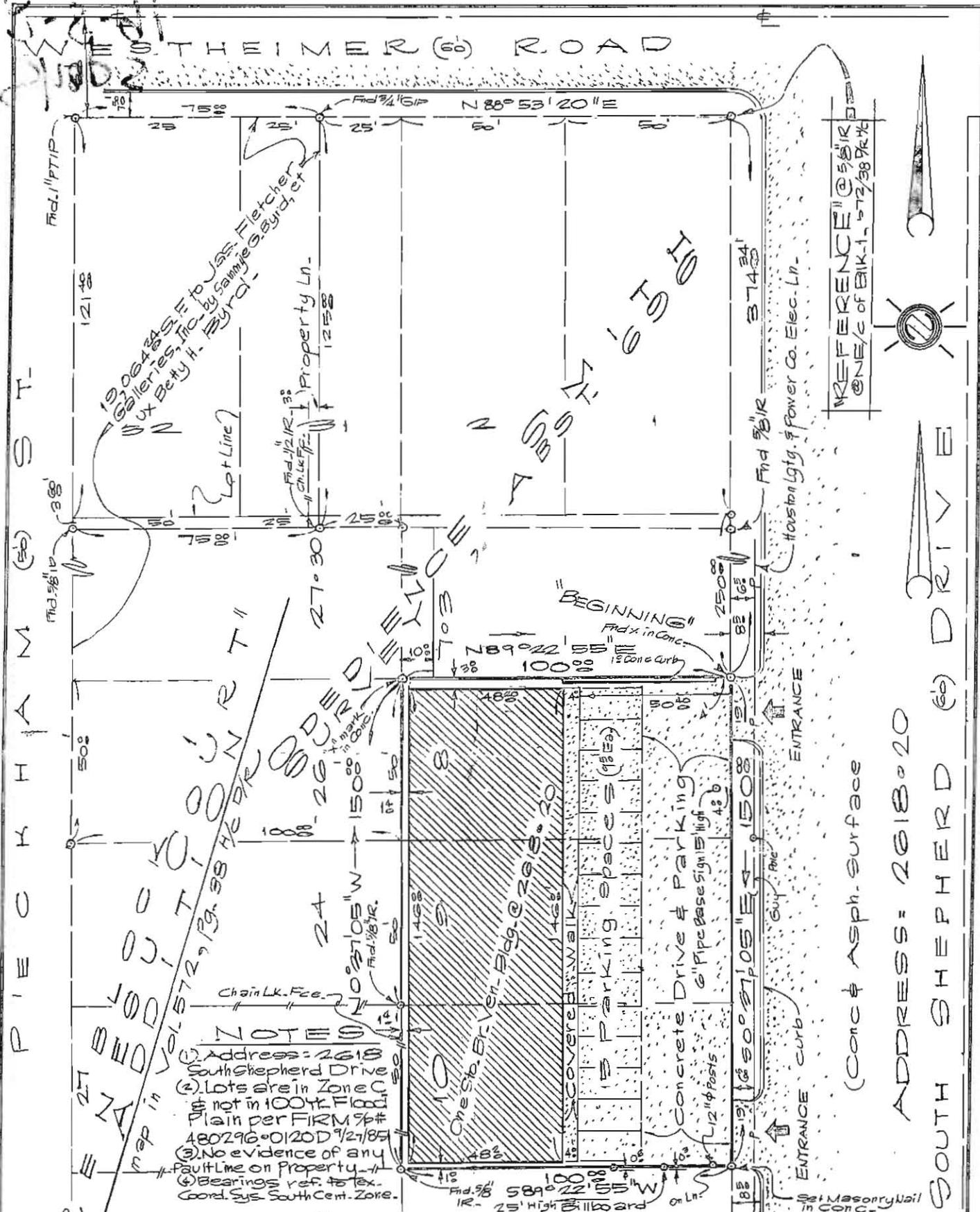
Thence South 0 degrees 37 minutes 05 seconds East with the West right-of-way line of said South Shepard Drive a distance of 374.34 ft. to a X mark found in concrete marking the Northeast corner of Lot 8 and the Southeast corner of Lot 7 and the Northeast corner and PLACE OF BEGINNING of the herein described 0.3444 acre tract;

THENCE continuing South 0 degrees 37 minutes 05 seconds East with the West right-of-way line of said South Shepard Dr. a distance of 150.00 ft. to a masonry nail set in concrete at the Southeast corner of Lot 10 and the Northeast corner of Lot 11;

THENCE South 89 degrees 22 minutes 55 seconds West perpendicular to the afore mentioned line a distance of 100.00 ft. to a 5/8 inch iron rod found at the Southwest corner of Lot 10 and the Northwest corner of Lot 11 and the Northeast corner of Lot 22 and the Southeast corner of Lot 23;

THENCE North 0 degrees 37 minutes 05 seconds West with the West line of Lots 10, 9, and 8 a distance of 150.00 ft. to a X mark in concrete at the Northeast corner of Lot 26 the Northwest corner of lot 8, the Southwest corner of Lot 7 and the Southeast corner of Lot 27;

THENCE North 89 degrees 22 minutes 55 seconds East with the division line between Lots 7 and 8 a distance of 150.00 ft. to the PLACE OF BEGINNING and containing 0.3444 acre being known as 2618 thru 2620 of South Shepard Dr., Houston, Texas 77098



**NOTES**

- Address: 2618 South Shepherd Drive
- Lots are in Zone C & not in 100% Flood Plain per FIRM 97# 480296-0120D 9/2/85
- No evidence of any Fault Line on Property.
- Bearings ref. to Tex. Coord. Sys. South Cent. Zone.

**TO ALL PARTIES INTERESTED IN TITLE TO PREMISES SURVEYED:**

I certify this plat to represent a survey made under my supervision on the ground, showing all improvements and no encroachments exist at the time of this survey, Cat. I.A., Cond. II.

*Charles A. McKinley*  
 Charles A. McKinley, Registered Public Surveyor, No. 1184, STATE OF TEXAS.



**BOUNDARY SURVEY OF 15,000 S.F. OR 0.344 AC. BEING LOTS 8, 9 & 10, BLOCK 1 OF "KENSU COURT" ADDITION OUT OF THE OBEDIENCE SMITH SURVEY, A. 696, CITY OF HOUSTON, HARRIS COUNTY, TEXAS,**

MAP RECORDED IN VOL. 572, PG. 38 OF H.C. DEED RECORDS. DATE: FEB. 8, 1991, SCALE: 1 INCH = 20 FT. OWNER: BERNSTEIN INVESTMENTS

ADDRESS: 2618-20 SOUTH SHEPHERD DRIVE  
 (Conc & Asph. Surface)



030-10-1110

payable to the order of First Interstate Bank of Texas, N.A. ("Beneficiary"), bearing interest and being payable as therein provided, the Note being secured by a vendor's lien herein reserved, and additionally secured by a Deed of Trust, Security Agreement and Financing Statement of even date herewith executed by Grantee to P. Michael Wells, Jr., Trustee, reference to which are made herein for all purposes; and in consideration of the payment of the purchase price to Grantor, Grantor hereby transfers, sets over, assigns and conveys to Beneficiary, its successors and assigns, the vendor's lien and superior title herein retained in the same manner and to the same extent as if the Note had been executed in Grantor's favor and assigned by Grantor to Beneficiary without recourse or warranty.

It is expressly agreed and stipulated that a vendor's lien and superior title are retained against the Property (to the extent of the purchase price therefor), until the Note and all interest thereon is fully paid, when this Deed shall become absolute.

EXECUTED on the date of the acknowledgement hereinbelow, to be effective however as of the 26 day of March, 1991.

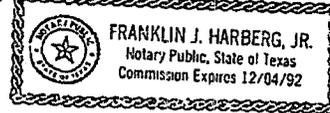
Alan B. Goldman  
Alan B. Goldman

Marcene S. Goldman  
Marcene S. Goldman

STATE OF TEXAS §  
  §  
COUNTY OF HARRIS §

This instrument was acknowledged before me on the 27<sup>th</sup> day of March, 1991, by Alan B. Goldman.

Franklin J. Harberg, Jr.  
Notary Public in and for the State of Texas



STATE OF TEXAS §  
  §  
COUNTY OF HARRIS §

This instrument was acknowledged before me on the 27<sup>th</sup> day of March, 1991, by Marcene S. Goldman.

Franklin J. Harberg, Jr.  
Notary Public in and for the State of Texas



After recording, return to:  
RETURN TO: \_\_\_\_\_  
ENDELHARDT, HARBERG & HUARD  
2100 SUMMIT TOWER  
11 GREENWAY PLAZA  
HOUSTON, TX 77046

BD339F0326911434  
34430587400000

030-10-1111

A TRACT OR PARCEL OF LAND CONTAINING 15,000 SQ. FT. OR 0.3444 ACRE BEING ALL OF LOTS 8, 9, AND 10, BLOCK 1 OF "RENESE COURT" ADDITION OUT OF THE OBEDIENCE SMITH SURVEY, ABSTRACT 696, HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 572, PAGE 38 OF THE HARRIS COUNTY DEED RECORDS, SAID 0.3444 ACRE TRACT BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS TO-WIT:

Commencing for reference at a 5/8 inch iron rod marking the intersection of the South right-of-way line of Westheimer Road and the West right-of-way line of South Shepard Dr. and the Northeast corner of said Block 1 as delineated on plat recorded in Volume 572, Page 38 of the Harris County Deed Records;

Thence South 0 degrees 37 minutes 05 seconds East with the West right-of-way line of said South Shepard Drive a distance of 374.34 ft. to a X mark found in concrete marking the Northeast corner of Lot 8 and the Southeast corner of Lot 7 and the Northeast corner and PLACE OF BEGINNING of the herein described 0.3444 acre tract;

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THENCE North 89 degrees 22 minutes 55 seconds East with the division line between Lots 7 and 8 a distance of 150.00 ft. to the PLACE OF BEGINNING and containing 0.3444 acre being known as 2618 thru 2620 of South Shepard Dr., Houston, Texas 77098.

AKG  
ms

EXHIBIT "A"

EXCEPTIONS

030-10-1112

1. The vendor's lien, Deed of Trust and Security Agreement referred to in the Deed to which this Exhibit "B" is attached.
2. Utility, drainage and sewer easements (if any) respectively for utilities, drainage and sewers serving the Property.
3. Taxes for 1991 (with respect to which the pro ration and adjustment provisions of the Deed to which this Exhibit "B" is attached shall be applicable) and taxes for future years during which Grantee owns the Property.

ANY PROVISION HEREIN WHICH PREVENTS THE SALE, RENTAL OR USE OF THE DESCRIBED REAL PROPERTY BECAUSE OF COLLISION OR IS IN VALID AND UNENFORCEABLE UNDER THE LAWS OF THE STATE OF TEXAS.  
 COUNTY OF HARRIS  
 I hereby certify that this instrument was FILED in File Number \_\_\_\_\_ Sequence on the date and at the time stamped hereon by me; and was duly RECORDED, in the Official Public Records of Real Property of Harris County, Texas on

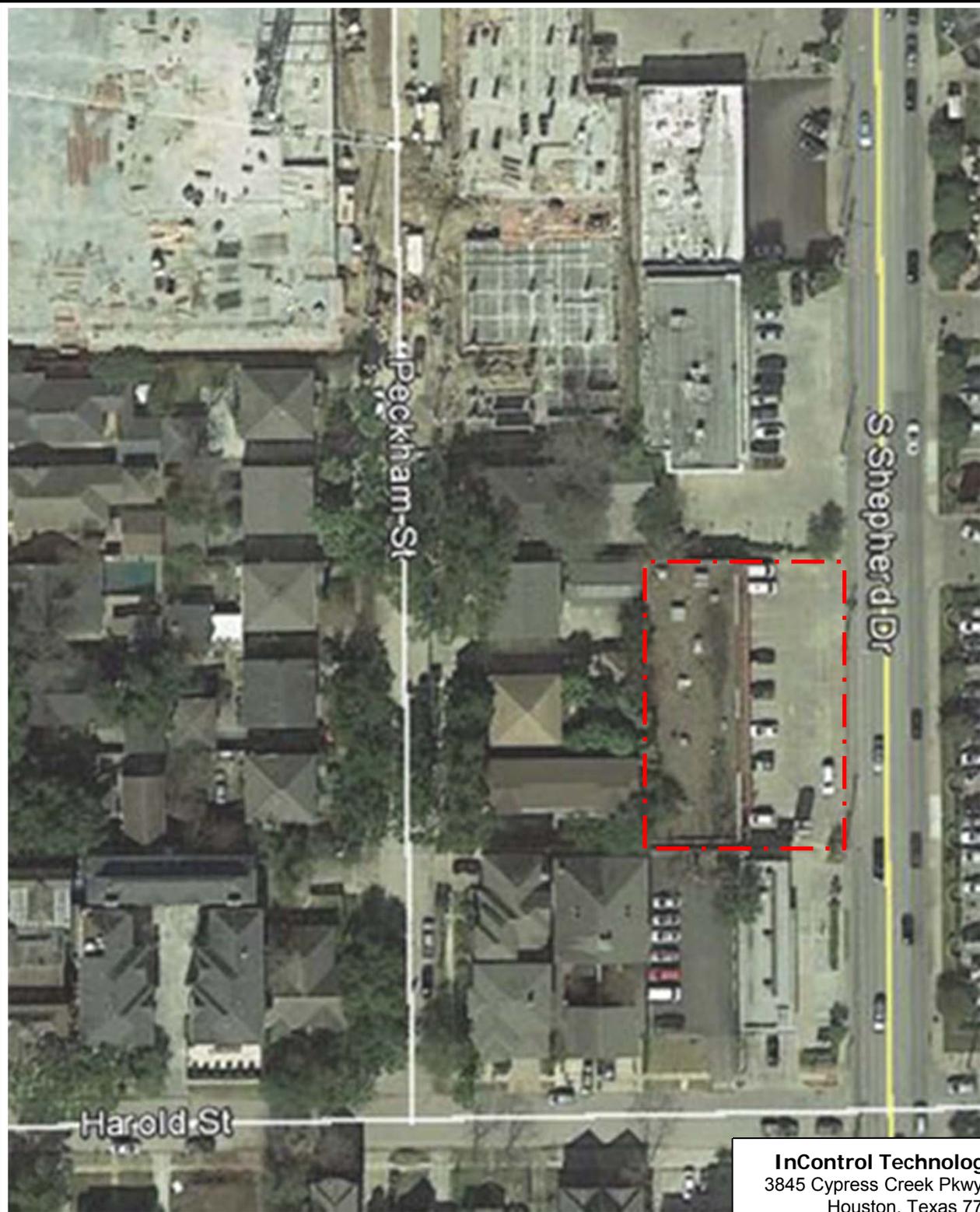
APR 1 1991



*Janita Roddenberry*  
 COUNTY CLERK,  
 HARRIS COUNTY, TEXAS

FILED  
 91 APR -1 PM 3:10  
*Janita Roddenberry*  
 COUNTY CLERK  
 HARRIS COUNTY, TEXAS

*A. P. S.*  
*M. S.*



**LEGEND**



MSD Boundary



Approximate Scale (Feet)

**InControl Technologies, Inc.**  
 3845 Cypress Creek Pkwy., Suite 195  
 Houston, Texas 77068  
 (281) 580-8892 FAX (281) 580-8853

**MSD Boundary Map**

CLIENT:	The Shops at Shepherd, Ltd. Eco Cleaners	PM:	MFM
LOCATION:	2620 S Shepherd Dr. Houston, Texas 77098	CHECKED:	
DETAILED:	DESIGNED:	PROJECT NO:	FIGURE:
7/20/15	LMG	667-103	A

## Appendix B

A description of the current use, and, to the extent known, the anticipated use(s), of the designated property and properties within 500 feet of the boundary of the designated property.

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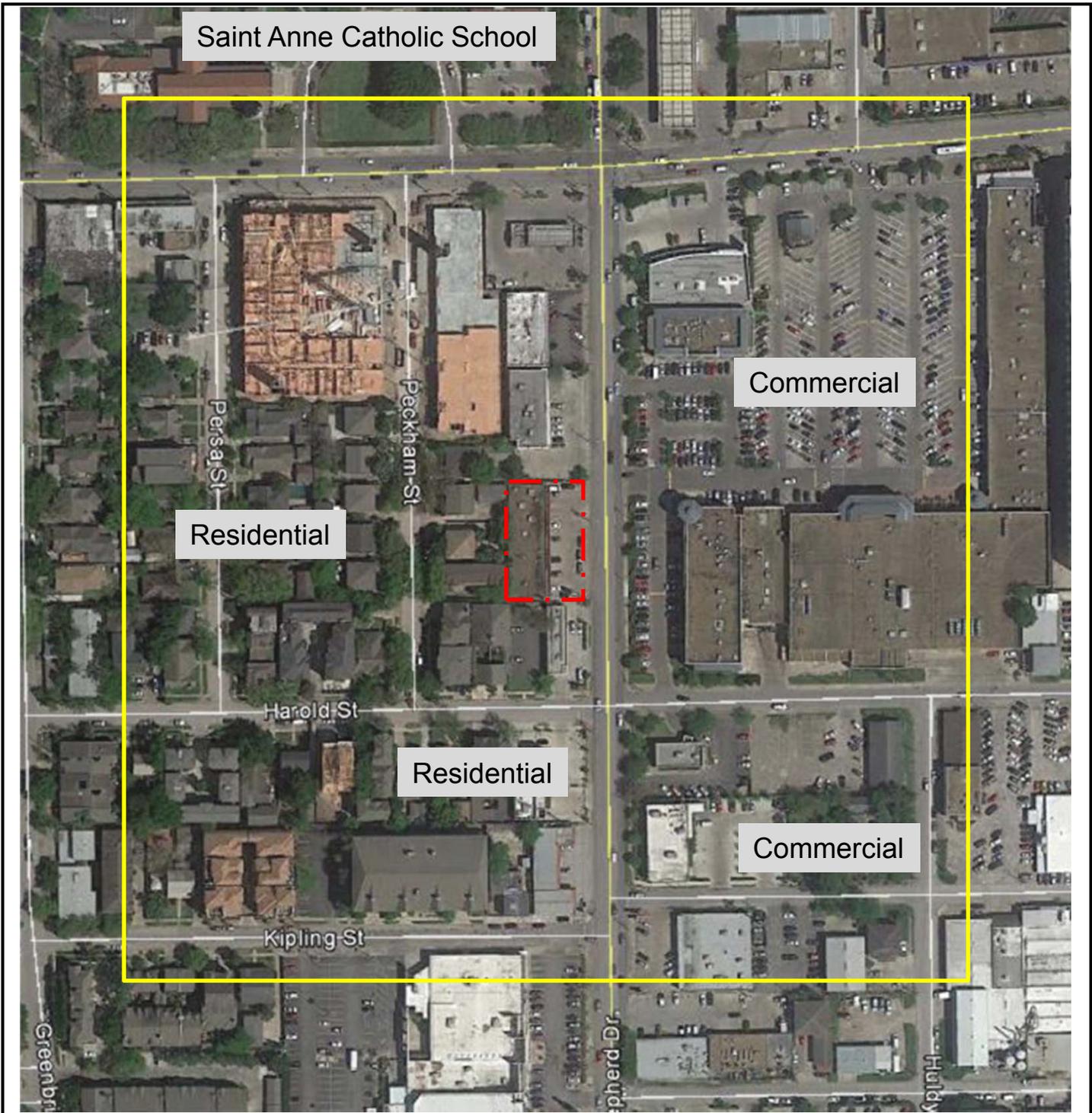
The proposed MSD area is comprised of the shopping center located at 2620 S. Shepherd, which totals 0.3444-acres.

The property is located southwest of downtown Houston, Harris County, Texas and within the City of Houston limits. The affected property is located in a mix of residential and commercial development (**Figure B**). **Figure B** provides a description of the surrounding land use within 500-feet of the site.

The current and future use of the subject property is expected to remain commercial.

- North – Westheimer Rd., followed by St. Anne Catholic School;
- East – S. Shepherd Dr., followed by commercial development;
- South – a mix of residential and commercial development;
- West – residential development.

The area to the west/northwest was recently converted from mixed commercial to multifamily residential.



Saint Anne Catholic School

Commercial

Residential

Residential

Commercial

**LEGEND**



**MSD Boundary**



**500-ft Boundary**

**N**



0 180 360



Approximate Scale (Feet)

**InControl Technologies, Inc.**  
 3845 Cypress Creek Pkwy., Suite 195  
 Houston, Texas 77068  
 (281) 580-8892 FAX (281) 580-8853

**Surrounding Property Use Map**

CLIENT:	The Shops at Shepherd, Ltd. Eco Cleaners	PM:	MFM
LOCATION:	2620 S Shepherd Dr. Houston, Texas 77098	CHECKED:	
DETAILED:	DESIGNED:	PROJECT NO.:	FIGURE:
7/20/15	LMG	667-103	<b>B</b>

## Appendix C

A site map showing:

- a. The location of the designated property.
- b. The topography of the designated property as indicated on publicly available sources, which must note the watershed including the nearest surface water body and whether the designated property is located in a floodplain or floodway, as those terms are defined in Chapter 19 of the Code of Ordinances.
- c. The detected area of groundwater contamination.
- d. The location of all soil sampling locations and all groundwater monitoring wells.
- e. Groundwater gradients, to the extent known, and direction of groundwater flow.
- f. The ingestion protective concentration level exceedence zone for each contaminant of concern, to the extent known.
- g. Depth to groundwater for each affected zone.

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The following is a listing of figures included in **Appendix C**.

Figure C1 – Topographic Map

Figure C2 – Watershed Map

Figure C3 – Flood Plain Map

Figure C4-1 – PCE Concentrations in Soil (April 2013)

Figure C4-2 – PCE Concentrations in Groundwater (June 2016)

Figure C4-3 – TCE Concentrations in Groundwater (June 2016)

Figure C5 – Soil Boring Location Map

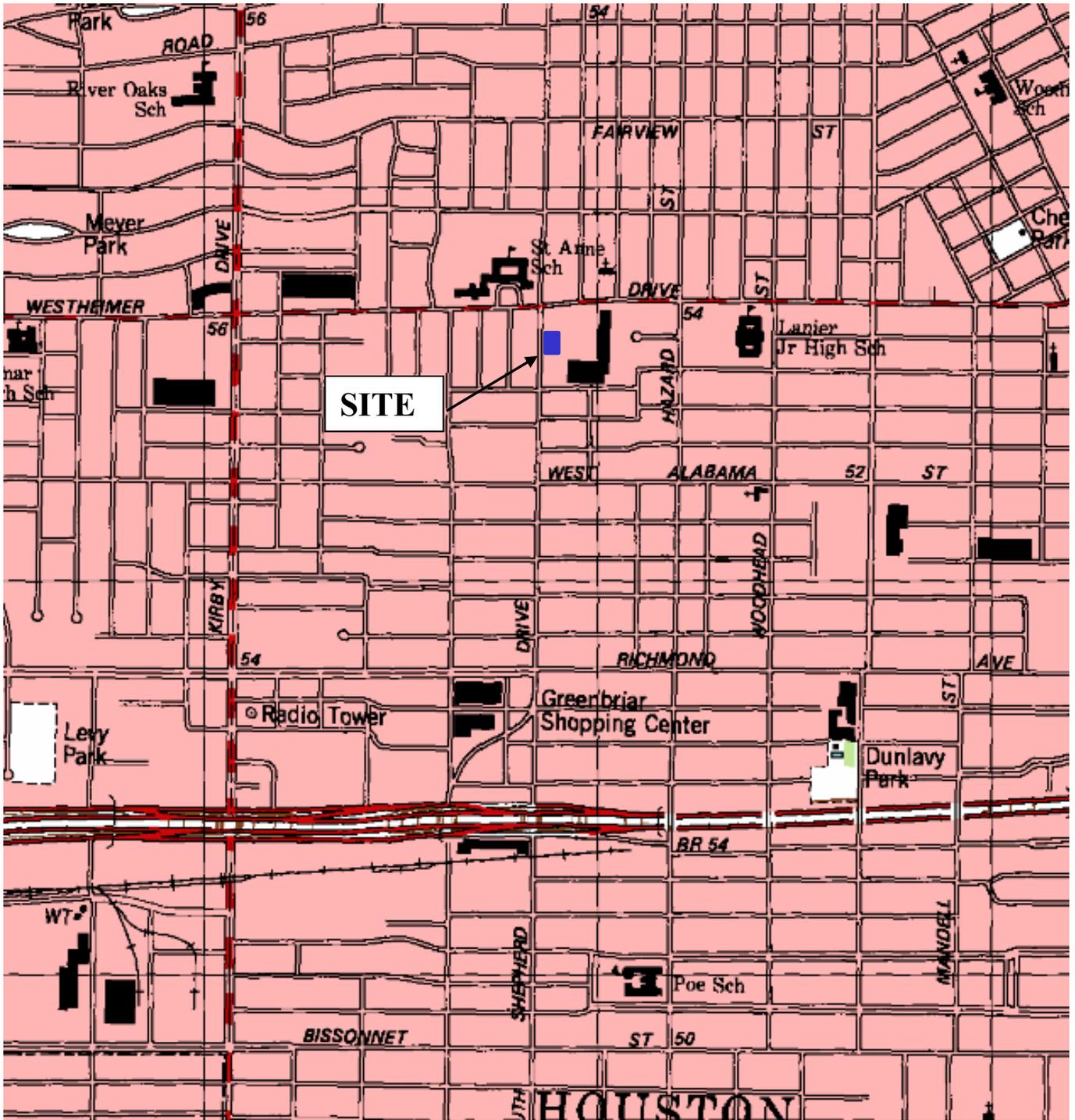
Figure C6 – Groundwater Monitoring Well Location Map

Figure C7 – Groundwater Gradient Map (June 2016)

The subject property is located on the border of the Brays Bayou and Buffalo Bayou watersheds (**Figure C2**) and the property is not located within the 100-year floodplain (**Figure C3**).

**Figure C4-1** depicts the PCE PCLE zone in soil within the proposed MSD boundary during the initial site assessment in April 2013. **Figure C4-2** and **Figure C4-3** depict the tetrachloroethene (PCE) and trichloroethene (TCE) groundwater PCLE zones within the proposed MSD boundary during the most recent sampling event (June 2016). **Figure C5** and **Figure C6** depict the locations of the soil and groundwater samples, respectively. Groundwater in this area tends to flow towards to the northwest (**Figure C7**). The primary chemicals of concern (COCs) are PCE and TCE.

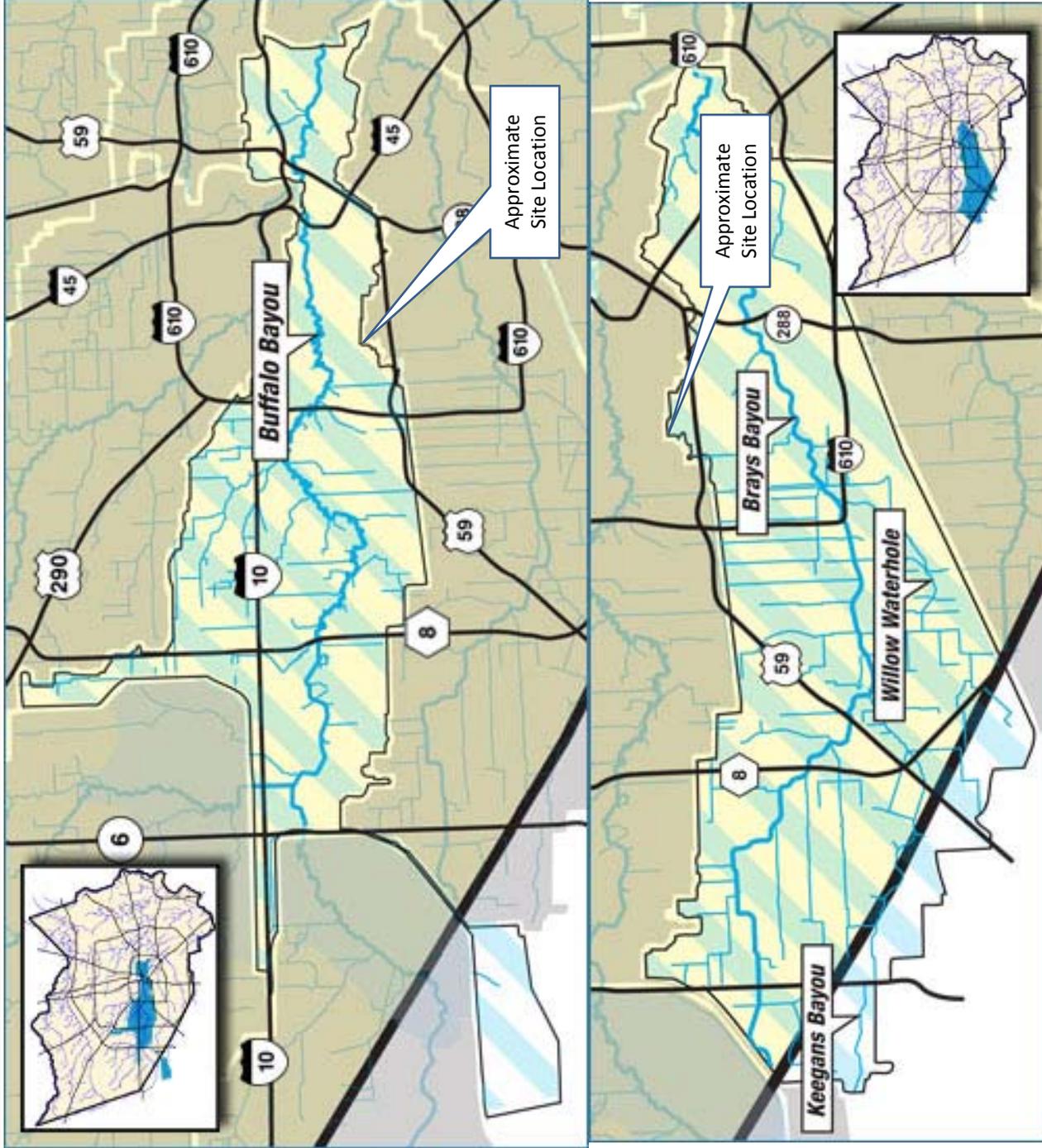
The first groundwater bearing unit is comprised of sand and is encountered at a depth of approximately 32-ft below ground surface (bgs) during drilling. The base of the first groundwater bearing unit is encountered at a depth of approximately 50- to 55-ft bgs and is underlain by a clay and/or sandstone. The average static depth to groundwater in the monitoring wells is 18-ft bgs.



**InControl Technologies, Inc.**  
 3845 Cypress Creek Pkwy., Suite 195  
 Houston, Texas 77068  
 (281) 580-8892 FAX (281) 580-8853

**Topographic Map**  
 (Bellaire Quad)

CLIENT:	The Shops at Shepherd, Ltd. Eco Cleaners	PM:	MFM
LOCATION:	2620 S Shepherd Dr. Houston, Texas 77098	CHECKED:	
DETAILED:	DESIGNED:	PROJECT NO.:	FIGURE:
7/20/15	LMG	667-103	C1



<b>InControl Technologies, Inc.</b> 3845 FM 1960 W, Suite 195 Houston, Texas 77068 (281) 580-8892 FAX (281) 580-8853	<b>Watershed Map</b>		LOCATION: 2620 S. Shepherd Dr. Houston, TX 77098	CHECKED:
	CLIENT: The Shops at Shepherd, Ltd. Eco Cleaners	PM: MFM	DETAILED: 7/20/15	DESIGNED: LMG
Source: Harris County Flood Control District				FIGURE: <b>C2</b>

## LEGEND

**SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT**

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Areas (SFHAs) are defined by the Federal Emergency Management Agency (FEMA) and are shown on the map as follows: Zone A, Zone AE, Zone AH, Zone AO, Zone AR, Zone AV, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

No base flood elevations determined.

Base flood elevations determined.

Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of altitudinal fan flooding, velocities also determined.

Area of special flood hazard formerly protected from the 1% annual chance flood by a levee or flood wall that has been removed, the protection system is being restored to provide protection from the 1% annual chance or greater flood event.

Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.

Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.

Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

**FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of obstructions so that the 1% annual chance flood can be carried without substantial increases in flood heights.

**OTHER FLOOD AREAS**

Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 100 acres; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 100 acres; areas of 1% annual chance flood.

**OTHER AREAS**

Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

**InControl Technologies, Inc.**  
 3845 FM 1960 W, Suite 195  
 Houston, Texas 77068  
 (281) 580-8892 FAX (281) 580-8853

**Flood Insurance Rate Map**

CLIENT:	The Shops at Shepherd, Ltd. Eco Cleaners	PM:	MFM
LOCATION:	2620 S. Shepherd Dr. Houston, TX 77098	CHECKED:	
DETAILED:	7/20/15	DESIGNED:	LMG
		PROJECT NO:	667-103
		FIGURE:	<b>C3</b>

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
 HARRIS COUNTY,  
 TEXAS  
 AND INCORPORATED AREAS

**PANEL 860 OF 1150**

SEE MAP INDEX FOR FIRM PANEL LAYOUT

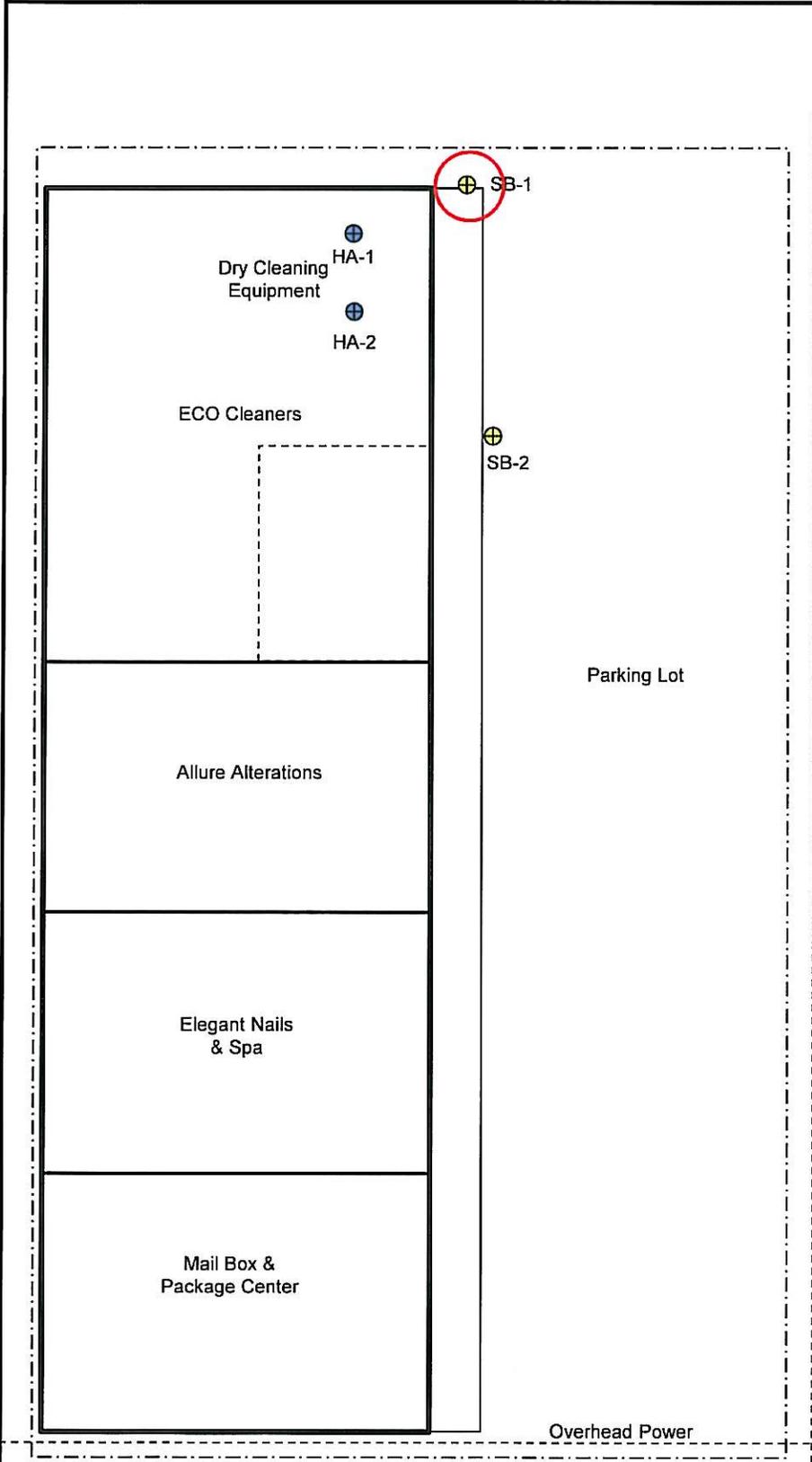
NUMBER	PANEL	DATE
860	1150	11/15/07
860	1150	06/16/2007

**MAP NUMBER 4820CB60L**  
**MAP REVISED: JUNE 16, 2007**

Federal Emergency Management Agency



Source: FEMA



**LEGEND**

- ⊕ Probe Boring Location
- ⊕ Hand Auger Location
- Contaminant Plume

S Shepherd Dr



N



0 20 40

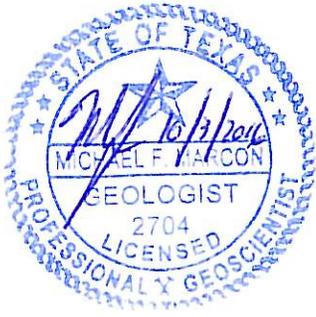


Approximate Scale (Feet)

**InControl Technologies, Inc.**  
 3845 FM 1960 W, Suite 195  
 Houston, Texas 77068  
 (281) 580-8892 FAX (281) 580-8853

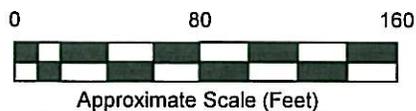
**Soil Boring Location Map**

CLIENT:	The Shops at Shepherd, Ltd. Eco Cleaners	PM:	MFM
LOCATION:	2620 S Shepherd Dr. Houston, Texas 77098	CHECKED:	
DETAILED:	DESIGNED:	PROJECT NO:	FIGURE:
7/20/15	MFM	667-103	C4-1



**LEGEND**

- ⊕ Monitor Well Location
- MSD Boundary
- PCLE Zone

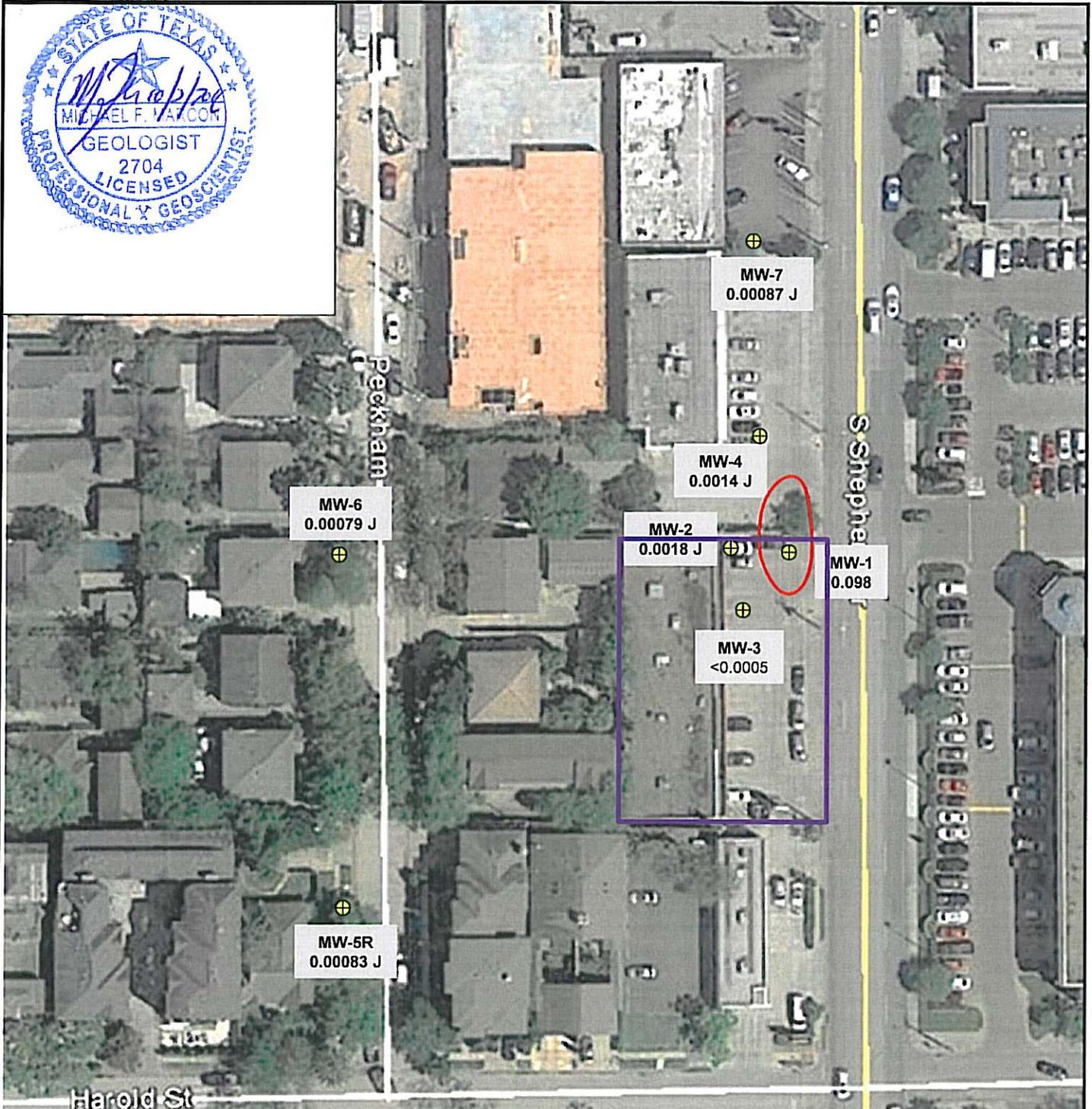
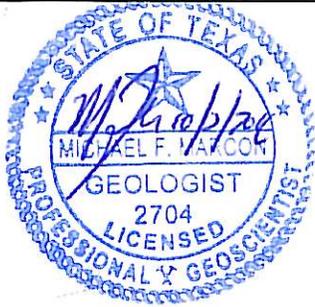


**InControl Technologies, Inc.**

14731 Pebble Bend Drive  
Houston, Texas 77068  
(281) 580-8892 FAX (281) 580-8853

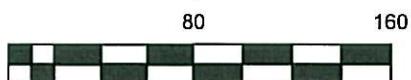
**PCE Concentration Map  
June 2016**

CLIENT:	Bernstein Investments Eco Cleaners	PM:	MFM
LOCATION:	2620 S Shepherd Dr. Houston, Texas 77098	CHECKED:	
DETAILED:	DESIGNED:	PROJECT NO.:	FIGURE:
12/21/15	LMG	667-103	C4-2



**LEGEND**

- ⊕ Monitor Well Location
- MSD Boundary
- PCLE Zone



Approximate Scale (Feet)

**InControl Technologies, Inc.**

14731 Pebble Bend Drive  
Houston, Texas 77068  
(281) 580-8892 FAX (281) 580-8853

**TCE Concentration Map  
June 2016**

CLIENT:	Bernstein Investments Eco Cleaners	PM:	MFM
LOCATION:	2620 S Shepherd Dr. Houston, Texas 77098	CHECKED:	
DETAILED:	DESIGNED:	PROJECT NO.:	FIGURE:
12/21/15	LMG	667-103	<b>C4-3</b>

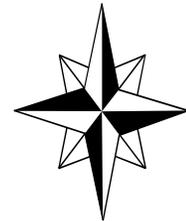
**LEGEND**

- ⊕ Soil Boring Location
- ⊕ Hand Auger Location



S Shepherd Dr

N

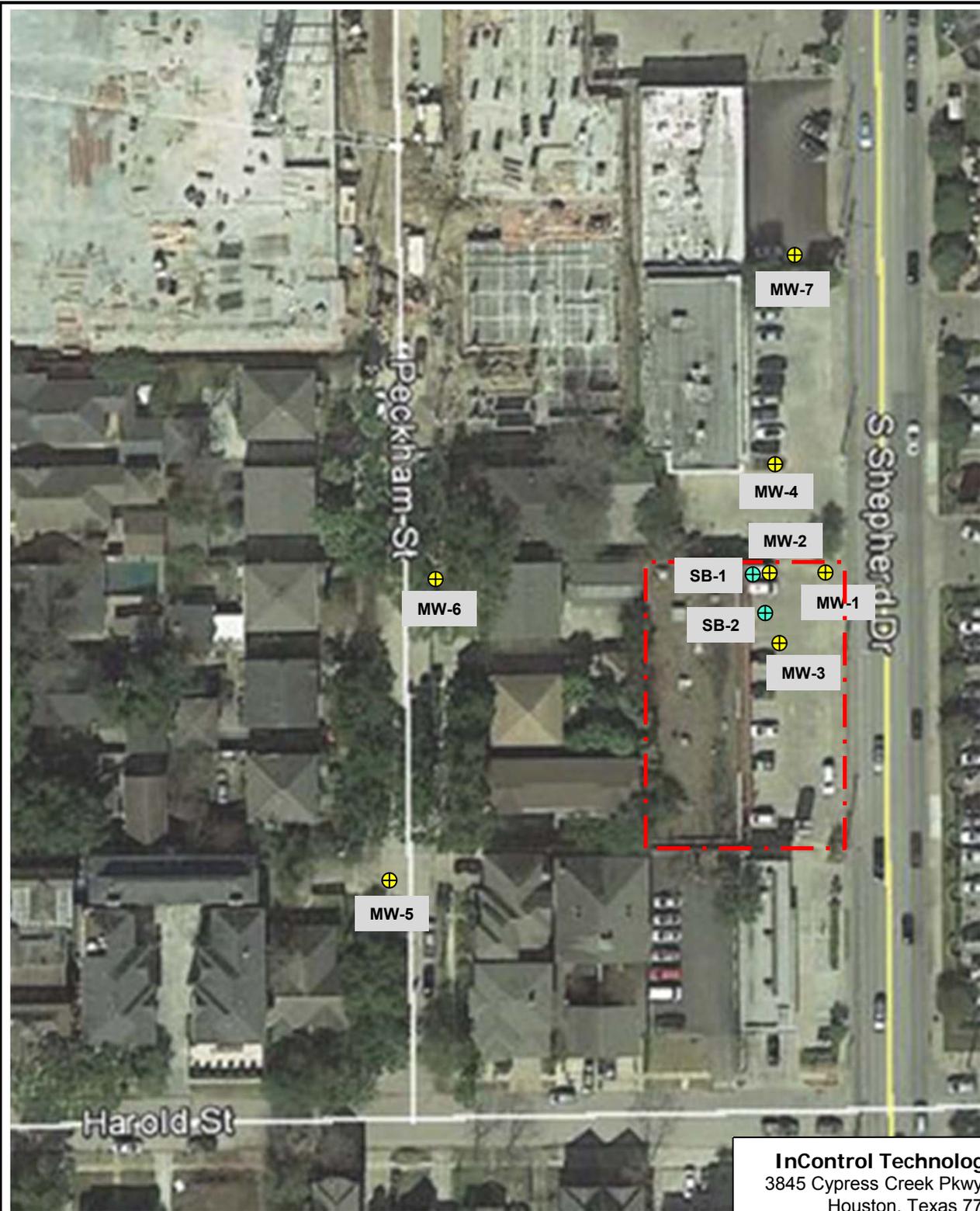


Approximate Scale (Feet)

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 3845 FM 1960 W, Suite 195  
 Houston, Texas 77068  
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**Soil Boring Location Map**

CLIENT:	The Shops at Shepherd, Ltd. Eco Cleaners	PM:	MFM
LOCATION:	2620 S Shepherd Dr. Houston, Texas 77098	CHECKED:	
DETAILED:	DESIGNED:	PROJECT NO:	FIGURE:
7/30/15	MFM	667-103	<b>C5</b>

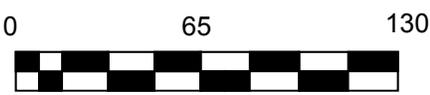


**LEGEND**

-  Permanent Monitoring Well Location
-  Temporary Monitoring Well Location



MSD Boundary

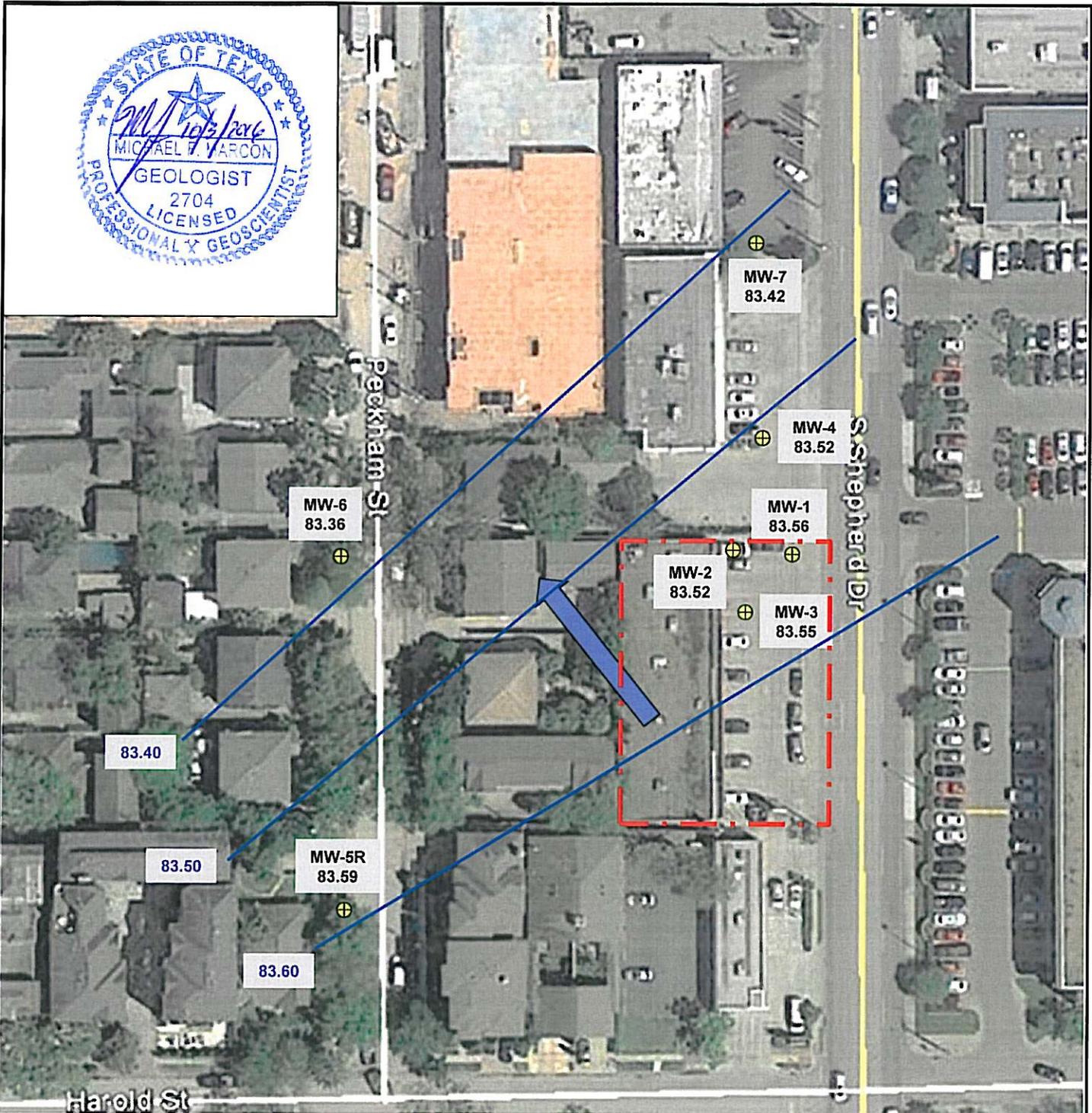


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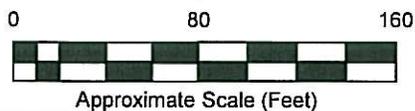
**Groundwater Monitoring Well Location Map**

CLIENT: The Shops at Shepherd, Ltd. Eco Cleaners		PM: MFM	
LOCATION: 2620 S Shepherd Dr. Houston, Texas 77098		CHECKED:	
DETAILED: 9/3/14	DESIGNED: LMG	PROJECT NO: 667-103	FIGURE: C6



**LEGEND**

- ⊕ Monitor Well Location
- ⌈ MSD Boundary
- Groundwater Piezometric Elevation Lines



**InControl Technologies, Inc.**

14731 Pebble Bend Drive  
Houston, Texas 77068  
(281) 580-8892 FAX (281) 580-8853

**Groundwater Gradient Map  
June 2016**

CLIENT:	Bernstein Investments Eco Cleaners	FM:	MFM
LOCATION:	2620 S Shepherd Dr. Houston, Texas 77098	CHECKED:	
DETAILED:	DESIGNED:	PROJECT NO:	FIGURE:
12/21/15	LMG	667-103	C7

## Appendix D

For each contaminant of concern within the designated groundwater:

- a. A description of the ingestion protective concentration level exceedance zone and the non-ingestion protective concentration level exceedance zone, including a specification of the horizontal area and the minimum and maximum depth below ground surface.
- b. The level of contamination, the ingestion protective concentration level, and the non-ingestion protective concentration level, all expressed as mg/L units.
- c. Its basic geochemical properties (e.g. whether the contaminant of concern migrates with groundwater, floats, or is soluble in water).

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**A) Protective Concentration Level Exceedance (PCLE) Zone** – A review of recent groundwater sampling data indicates that the chemicals of concern (COCs) that currently exceed the Tier 1  $^{GW}GW_{ing}$  PCLs are tetrachloroethene (PCE) and trichloroethene (TCE) (**Table D1**). The PCLE zones are depicted on **Figure C4-1** and **Figure C4-2** and are discussed in more detail below. The area of affected groundwater is not fully delineated to the east. An attempt was made to install a delineation well on the shopping center property to the east across S. Shepherd. After several months of negotiations with the property owner, InControl Technologies was denied access to the property. Included in **Appendix D** is the letter we received denying us access. On the western end of the PCLE zone, COC concentrations in MW-6 slightly exceed the Tier 1  $^{GW}GW_{ing}$  PCL. The next alternative place to install a delineation well further westward is on the next street over (Persa Street). This would place the well approximately 235-ft west of MW-6. At this point, the linear extrapolation indicates that the concentrations in a Persa Street delineation well would likely fall below the Tier 1  $^{GW}GW_{ing}$  PCL. A comparison of the groundwater sampling results with applicable non-ingestion protective concentration levels ( $^{Air}GW_{Inh-V}$ ) indicates that none of the groundwater samples reported a COC concentration above the  $^{Air}GW_{Inh-V}$  PCL. Therefore, based on the recent groundwater monitoring results, besides the  $^{GW}GW_{ing}$  exceedances, there are no other protective concentration level exceedance zones within the proposed MSD boundary.

Soil samples were collected from two hand auger borings inside the dry cleaner and two soil borings advanced in front of the dry cleaner. Only the soil sample collected from SB-1 (14-16 ft) reported a COC slightly above the Tier 1  $^{GW}Soil_{ing}$  PCL. The concentration of PCE was 0.0654 mg/kg and the PCL is 0.05 mg/kg.

The groundwater bearing unit is comprised of a sand and is encountered at a depth of approximately 32-ft bgs during drilling. The base of the first groundwater bearing unit is encountered at a depth of approximately 50- to 55-ft bgs and is underlain by a clay or sandstone. The average static depth to groundwater in the monitoring wells is 18-ft bgs. The groundwater bearing unit is a sand unit which is assumed to be a Class 2 groundwater resource.

**B) Groundwater Data Ingestion PCL Exceedences** – The following table represents the most recent groundwater monitoring data for the site collected in June 2016.

**Table D1 – Groundwater Ingestion PCL Exceedences in First Groundwater Bearing Unit**

Monitoring Well ID	PCE (mg/L)	TCE (mg/L)	Cis-1,2- DCE (mg/L)	Trans-1,2- DCE (mg/L)	VC (mg/L)	1,1-DCE (mg/L)
<b>Tier 1 <sup>GW</sup>GW<sub>ing</sub> PCLs</b>	<b>0.005</b>	<b>0.005</b>	<b>0.07</b>	<b>0.1</b>	<b>0.002</b>	<b>0.007</b>
<b>Tier 1 <sup>Air</sup>GW<sub>Inh-v</sub> PCLs</b>	<b>500</b>	<b>24</b>	<b>1,200</b>	<b>770</b>	<b>3.8</b>	<b>1,700</b>
MW-1	<b>0.54</b>	<b>0.098</b>	<b>0.074</b>	<0.0004	<0.0004	<0.0005
MW-2	<b>0.029</b>	0.0018 J	<0.0006	<0.0004	<0.0004	<0.0005
MW-3	<0.0006	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
MW-4	<b>0.0064</b>	0.0014 J	<0.0006	<0.0004	<0.0004	<0.0005
MW-5	0.0016 J	0.00065 J	<0.0006	<0.0004	<0.0004	<0.0005
MW-6	<b>0.0061</b>	0.00079 J	<0.0006	<0.0004	<0.0004	<0.0005
MW-7	0.00076 J	0.00087 J	0.0072	<0.0004	<0.0004	<0.0005

Notes – Values in **Bold** exceed the <sup>GW</sup>GW<sub>ing</sub> PCL (ingestion PCLE)

All groundwater COC concentrations observed at the site to date are less than the <sup>Air</sup>GW<sub>Inh-v</sub> non-ingestion PCL. Therefore, based on the monitoring data there is no non-ingestion PCLE zone on the subject property.

**C) Groundwater COCs** – The chemicals of concern (COCs) detected in groundwater samples (PCE and TCE) are associated with the historic dry cleaner operations within the proposed MSD boundary.

Chlorinated solvents are characterized by their high volatilities, high densities, low viscosities, low interfacial tension, low absolute solubilities, high relative solubilities, low partitioning to soil materials and low degradability. Chlorinated solvents will dissolve in water at low concentrations but once the groundwater has reached the saturation limit for that compound, the chlorinated solvent will form a separate phase in equilibrium with the water. Because chlorinated solvents have higher densities relative to water, the separate phase may “sink”. However, these compounds tend to form micro-droplets which adhere to the soil particles within the saturated unit. It is also common for these chemicals to collect within the capillary fringe between the vadose zone and the saturated unit. Because of these characteristics, these compounds are referred to as “dense non-aqueous phase liquids” (DNAPLs). In extremely high concentrations DNAPLs can penetrate the water table and form “pools” on the top of less permeable layers. Historically, DNAPL has not been identified in any of the monitor wells within the groundwater monitor well network and is not expected to be present at this site given the relatively low concentration of chlorinated solvents detected in groundwater.

Based on the field observations and laboratory results, it appears that the groundwater COCs on the subject property are primarily dissolved in the shallow groundwater.



January 22, 2015

Mr. Lauren Grawey, P.G.  
InControl Technologies  
3845 Cypress Creek Parkway, Suite 195  
Houston, TX 77068

RE: Access for Drilling Sample Well at Shepherd Square  
Shopping Center

Dear Lauren:

Per our conversation the ownership at Shepherd Square has respectfully declined the request to drill a sample well on the property at this time.

Should you need further assistance you can reach me at (713) 600-1723 or by email at [smazewski@wulfe.com](mailto:smazewski@wulfe.com)

Sincerely,

**WULFE MANAGEMENT COMPANY, INC.**  
As Managing Agent for Shepherd Investors, LP

A handwritten signature in blue ink that reads "Susan S. Mazewski".

Susan S. Mazewski, CPM  
Property Manager

## Appendix E

A table displaying the following information for each contaminant of concern, to the extent known:

- a. The maximum concentration level for soil and groundwater, the ingestion protective concentration level, and the non-ingestion protective concentration level, all expressed as mg/L units.
- b. The critical protective concentration level without the municipal setting designation, highlighting any exceedences.

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**Appendix E** contains tables summarizing the concentration levels for the primary chemicals of concern in soil and groundwater. The tables include the concentration level, the ingestion protective concentration limits ( $^{GW}Soil_{Ing}$  for soil and  $^{GW}GW_{Ing}$  for groundwater), the non-ingestion protective concentration limits for soil ( $^{Tot}Soil_{Comb}$  and  $^{Air}Soil_{Inh-V}$ ) and groundwater ( $^{Air}GW_{Inh-V}$ ), the critical protective concentration limits assuming no MSD is in place ( $^{GW}Soil_{Ing}$  for soil and  $^{GW}GW_{Ing}$  for groundwater), and the critical PCLs assuming that an MSD is in place ( $^{Tot}Soil_{Comb}$  for soil and  $^{Air}GW_{Inh-V}$  for groundwater).

**Table E1** is a summary of Volatile Organic Compounds (VOCs) in Soil.

**Table E2** is a summary of Volatile Organic Compounds (VOCs) in Groundwater.

Table E1  
 Summary of Volatile Organic Compounds in Soil  
 Eco Cleaners  
 2620 S. Shepherd Dr., Houston, TX 77098  
 VCP No. 2628

Sample ID	Sample Depth	Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride	1,1-Dichloroethene
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Residential	<sup>Tot</sup> Soil <sub>Comb</sub>		710	18	140	590	3.7	2300
Residential	<sup>GW</sup> Soil <sub>Ing</sub>		0.05	0.034	0.25	0.49	0.022	0.05
Residential	<sup>Air</sup> Soil <sub>Inh-V</sub>		940	31	920	920	43	5200
HA-1	3-4	4/29/2013	0.00663	0.00168	0.000995	0.00137	0.00108	0.00146
	7-8	4/29/2013	0.00318 J	0.00171	0.00101	0.00139	0.0011	0.00149
HA-2	3-4	4/29/2013	0.00217 J	0.00169	0.001	0.00138	0.00109	0.00148
	7-8	4/29/2013	0.0031 J	0.00174	0.00103	0.00141	0.00112	0.00151
SB-1	14-16	4/29/2013	0.0654	0.00324 J	0.00467 J	0.00138	0.00109	0.00148
SB-2	14-16	4/29/2013	0.00722	0.00533 J	0.00183 J	0.00133	0.00105	0.00142

Notes:

Exceeds a PCL

J: Analyte was detected at the concentration less than the method detection limit

Table E2  
 Summary of Volatile Organic Compounds in Groundwater  
 Eco Cleaners  
 2620 S. Shepherd Dr., Houston, TX 77098  
 VCP No. 2628

Sample ID	Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride	1,1-Dichloroethene
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Residential	<sup>GW</sup> GW <sub>Ing</sub>	0.005	0.005	0.07	0.1	0.002	0.007
Residential	<sup>Air</sup> GW <sub>Inh-V</sub>	500	24	1200	770	3.8	1700
MW-1	7/24/2013	0.015	0.00377 J	0.00336 J	<0.00088	<0.00085	<0.00076
	1/7/2014	0.00306 J	<0.00158	0.0111	<0.00088	<0.00085	<0.00076
	7/8/2014	0.14	0.048	0.045	<0.0004	<0.0004	<0.0005
	9/5/2014	0.29	0.10	0.07	<0.0004	<0.0004	<0.0005
	12/23/2014	0.482	0.16	0.0963	<0.0025	<0.0025	<0.0025
	3/10/2015	0.429	0.121	0.0653	<0.001	<0.001	<0.001
	6/2/2015	0.193	0.0568	0.0355	<0.0005	<0.0005	<0.0005
	9/2/2015	0.69	0.20	0.17	0.0022 J	<0.0004	<0.0005
	12/2/2015	0.30	0.096	0.076	0.00043 J	<0.0004	<0.0005
	3/14/2016	0.44	0.14	0.1	0.0005 J	<0.0004	<0.0005
6/10/2016	0.54	0.098	0.074	<0.0004	<0.0004	<0.0005	
MW-2	7/24/2013	0.104	0.0198	0.0242	0.00214 J	<0.00085	<0.00076
	1/7/2014	0.0549	0.0067	0.00248 J	<0.00088	<0.00085	<0.00076
	7/8/2014	0.094	0.0082	<0.0006	<0.0004	<0.0004	<0.0005
	9/5/2014	0.16	0.023	0.022	<0.0004	<0.0004	<0.0005
	12/23/2014	0.215	0.0349	0.0248	<0.0005	<0.0005	<0.0005
	3/10/2015	0.237	0.0263	0.0132	<0.0005	<0.0005	<0.0005
	6/2/2015	0.0767	0.00364	0.00141	<0.0005	<0.0005	<0.0005
	9/2/2015	0.074	0.0039 J	0.0019 J	<0.0004	<0.0004	<0.0005
	12/2/2015	0.058	0.0026 J	0.0014 J	<0.0004	<0.0004	<0.0005
	3/14/2016	0.043	0.0025 J	0.00064 J	<0.0004	<0.0004	<0.0005
6/10/2016	0.029	0.0018 J	<0.0006	<0.0004	<0.0004	<0.0005	

Table E2  
Summary of Volatile Organic Compounds in Groundwater  
Eco Cleaners  
2620 S. Shepherd Dr., Houston, TX 77098  
VCP No. 2628

Sample ID	Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride	1,1-Dichloroethene
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Residential	<sup>GW</sup> GW <sub>Ing</sub>	0.005	0.005	0.07	0.1	0.002	0.007
Residential	<sup>Air</sup> GW <sub>Inh-V</sub>	500	24	1200	770	3.8	1700
MW-3	7/24/2013	<0.00124	<0.00158	<0.00056	<0.00088	<0.00085	<0.00076
	1/7/2014	<0.00124	<0.00158	<0.00056	<0.00088	<0.00085	<0.00076
	7/8/2014	<0.0006	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
	9/5/2014	<0.0006	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
	12/23/2014	<0.00058	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	3/10/2015	<0.00058	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	6/2/2015	<0.00058	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
	9/2/2015	<0.0006	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
	12/2/2015	<0.0006	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
	3/14/2016	<0.0006	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
6/10/2016	<0.0006	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005	
MW-4	3/12/2014	0.0228	0.00597	0.00412 J	<0.00088	<0.00085	<0.00076
	7/8/2014	0.013	0.0022 J	<0.0006	<0.0004	<0.0004	<0.0005
	9/5/2014	0.027	0.0054	0.0037 J	<0.0004	<0.0004	<0.0005
	12/23/2014	0.0255	0.00663	0.00341	<0.0005	<0.0005	<0.0005
	3/10/2015	0.0249	0.00584	0.00278	<0.0005	<0.0005	<0.0005
	6/2/2015	0.00424	0.000756 J	<0.0005	<0.0005	<0.0005	<0.0005
	9/2/2015	0.033	0.0083	0.0033 J	<0.0004	<0.0004	<0.0005
	12/2/2015	0.023	0.0058	0.0026 J	<0.0004	<0.0004	<0.0005
	3/14/2016	0.015	0.0043 J	0.0018 J	<0.0004	<0.0004	<0.0005
	6/10/2016	0.0064	0.0014 J	<0.0006	<0.0004	<0.0004	<0.0005
MW-5	3/12/2014	0.00507	<0.00158	<0.00056	<0.00088	<0.00085	<0.00076
	7/8/2014	0.0062	0.0014 J	<0.0006	<0.0004	<0.0004	<0.0005
	9/5/2014	0.0062	0.0017 J	<0.0006	<0.0004	<0.0004	<0.0005
	12/2/2015	0.0028 J	0.00093 J	0.00079 J	<0.0004	<0.0004	<0.0005
	5/5/2015	0.0014 J	0.0007 J	<0.0006	<0.0004	<0.0004	<0.0005
	6/2/2015	0.00164	0.000786 J	0.0007 J	<0.0005	<0.0005	<0.0005
	9/2/2015	0.0027 J	0.00098 J	0.00089 J	<0.0004	<0.0004	<0.0005
	3/14/2016	0.0022 J	0.00083 J	0.00071 J	<0.0004	<0.0004	<0.0005
	6/10/2016	0.0016 J	0.00065 J	<0.0006	<0.0004	<0.0004	<0.0005

Table E2  
 Summary of Volatile Organic Compounds in Groundwater  
 Eco Cleaners  
 2620 S. Shepherd Dr., Houston, TX 77098  
 VCP No. 2628

Sample ID	Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride	1,1-Dichloroethene
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Residential	<sup>GW</sup> GW <sub>Ing</sub>	0.005	0.005	0.07	0.1	0.002	0.007
Residential	<sup>Air</sup> GW <sub>Inh-V</sub>	500	24	1200	770	3.8	1700
MW-6	7/8/2014	0.0045 J	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
	9/5/2014	<0.0006	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
	12/23/2014	0.00881	0.00121	0.000529 J	<0.0005	<0.0005	<0.0005
	3/10/2015	0.0103	0.00151	0.000513 J	<0.0005	<0.0005	<0.0005
	6/2/2015	0.00934	0.00139	0.000528 J	<0.0005	<0.0005	<0.0005
	9/2/2015	0.0085	0.0013 J	<0.0006	<0.0004	<0.0004	<0.0005
	12/2/2015	0.012	0.0016 J	<0.0006	<0.0004	<0.0004	<0.0005
	3/14/2016	0.011	0.0013 J	<0.0006	<0.0004	<0.0004	<0.0005
	6/10/2016	0.0061	0.00079 J	<0.0006	<0.0004	<0.0004	<0.0005
MW-7	7/8/2014	0.0017 J	<0.0005	<0.0006	<0.0004	<0.0004	<0.0005
	9/5/2014	0.0019 J	0.0016 J	<0.0006	<0.0004	<0.0004	<0.0005
	12/23/2014	0.00188	0.000822 J	0.000817 J	<0.0005	<0.0005	<0.0005
	3/10/2015	0.00337	0.00169	0.00256	<0.0005	<0.0005	<0.0005
	6/2/2015	0.00122	0.000896 J	0.00541	<0.0005	<0.0005	<0.0005
	9/2/2015	0.0012 J	0.0011 J	0.017	<0.0004	<0.0004	<0.0005
	12/2/2015	0.0013 J	0.0013 J	0.013	<0.0004	<0.0004	<0.0005
	3/14/2016	0.00083 J	0.00084 J	0.0042 J	<0.0004	<0.0004	<0.0005
	6/10/2016	0.00076 J	0.00087 J	0.0072	<0.0004	<0.0004	<0.0005

Notes:

  Exceeds a PCL

<: Analyte was not detected at or above the reported sample detection limit

J: Analyte was detected at the concentration less than the method detection limit

## Appendix F

If the plume extends beyond the limits of property owners listed in this application, list the owners of the additional property beneath which the plume(s) extend(s), and a summary of the interactions with those property owners about the plume(s) and this MSD application. *Please Note: You are not required under this item to notify affected property owners, only to provide a summary of who affected property owners are, and if there have been any communications. "No contact" can be an acceptable answer.*

Shallow groundwater has been affected by dissolved phase chemicals including PCE and TCE. The area of affected groundwater is depicted on **Figure C4-2** and **Figure C4-3**. Based on the results of the most recent groundwater monitoring and sampling event conducted in June 2016, the area of affected groundwater extends off-site in the up gradient and downgradient directions.

The plume extends beneath the following properties:

Property Address	Owner Name	Owner Mailing Address	HCAD Property ID No.
<b>2620 S. Shepherd Dr. Houston, TX 77098</b>	<b>The Shops at Shepherd, Ltd.</b>	<b>1800 St. James Place, St. 300 Houston, TX 77056</b>	<b>056-223-000-0008</b>
2612 S. Shepherd Dr. Houston, TX 77098	YJ4300 LP	2612 S. Shepherd Dr. Houston, TX 77098	056-223-000-0005
2606 S. Shepherd Dr. Houston, TX 77098	Billiard Designs, Inc.	2601 W Lane Dr. Apt C Houston, TX 77027	056-223-000-0003
City of Houston Right-of-Way	City of Houston	611 Walker St. Houston, TX 77002	NA
2625 Peckham St. Houston, TX 77098	Clayton & Michele Moliver	PO Box 236 Seabrook, TX 77586	056-223-000-0025
2621 Peckham St. Houston, TX 77098	TN Global Group Corp	11331 Richmond Ave., Ste N107A, Houston, TX 77082	056-223-000-0007
2628 Peckham St. Houston, TX 77098	Janet Ramsey	2628 Peckham St. Houston, TX 77098	115-364-000-0001

InControl has been in contact with the property owners for the properties located at 2606 S. Shepherd Dr. and 2612 S. Shepherd Dr. Both of these property owners are sent a copy of the analytical results for the monitoring well installed on their property after each sampling event. In addition, a letter was sent to the City of Houston, TN Global Group Corp., and Ms. Janet Ramsey.

## Appendix G

A statement as to whether the source of the plume has been removed, the plume of contamination is stable (i.e. no change) or contracting, and the plume is delineated, **with the basis for that statement.** Please include historical sampling data.

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Shallow groundwater is affected by dissolved phase chemicals including PCE and TCE. These chemicals are believed to be associated with the historic dry cleaner operations conducted on the subject property. The historical equipment was removed and Eco Cleaners now uses equipment that cleans with a Stoddard based solvent. The chlorinated solvents tend to move rapidly in the sub-surface environment and quickly reach equilibrium as long as there is no ongoing contributing mass source. The source, perc-based dry cleaning, is no longer active at this site. Therefore, there can be no new mass added to the system.

Six soil samples were collected from the onsite property during the initial Phase II investigation. Only one sample exceeded a <sup>GW</sup>Soil<sub>ing</sub> PCL. SB-1 (14-16) exceeded the PCL for PCE at a concentration of 0.0654 mg/kg (**Table E1**). **Figure C4-1** depicts the PCE plume in shallow soil. There is not believed to be a significant contributing source of mass to groundwater.

The current groundwater monitoring network consists of seven permanent groundwater monitoring wells. Five of these wells have exceeded a PCL at some point during the sampling history. The lateral extent of groundwater impact in the shallow groundwater bearing unit has not been laterally delineated to the east or west. An attempt was made to install a delineation well on the shopping center property to the east across S. Shepherd. After several months of negotiations with the property owner, InControl Technologies was denied access to the property. Included in **Appendix D** is the letter we received denying us access. On the western end of the PCLE zone, COC concentrations in MW-6 slightly exceed the Tier 1 <sup>GW</sup>GW<sub>ing</sub> PCL. The next alternative place to install a delineation well further westward is on the next street over, Persa Street. This would place the well approximately 235-ft west of MW-6. At this point, the linear extrapolation indicates that the concentrations in a Persa Street delineation well would likely fall below the Tier 1 <sup>GW</sup>GW<sub>ing</sub> PCL. According to the most recent groundwater data, the concentrations of COCs within the plume appear to be relatively stable (**Table E2**). **Figure C4-2** and **Figure C4-3** depict the COC plume in shallow groundwater.

In addition, a simple first order decay model was developed to determine the potential edge of the plume near MW-6. The first order decay assumes a logarithmic decay based on distance. A linear regression was developed based on the data collected from MW-1, MW-2 and MW-6. The linear equation is  $\ln(\text{PCE}) = 5.11763907189088 - 0.013877726695259390 * \text{Distance}$ . Solving for distance and setting the PCE concentration to 5 µg/L yields a distance of 252-feet from MW-1. This places the downgradient limit/edge of the plume approximately 5-feet beyond the location of the current well. The extent of the groundwater plume will be set to approximately 5-feet west of MW-6 with a dashed line.

This analysis demonstrates that installing a monitoring well on the street west of Peckham St. would result in a COC detection below the PCL. The next street is an additional 220 feet west of MW-6. It is

our opinion that the expense of the additional well is not justified with the existing data. In addition, the trend of PCE in MW-6 is decreasing. The concentration has gone from 0.012 mg/L to 0.011 mg/L to its current concentration of 0.0061 mg/L. Based on the modeled value combined with the next available location to install a well is over 200-feet away, the additional well is not needed.

The groundwater data collected to date indicates that the area of affected groundwater is stable, and that the groundwater impacts are the result of historic releases associated with prior perc-based dry cleaning operations within the proposed MSD boundary. Given that these chemicals of concern are no longer used, there is no potential for further contribution.

The following discussion gives a brief description of the tenuous relationship between rainfall amounts and contaminant concentrations in groundwater. **Table G1** summarized the cumulative groundwater gauging data. Concentration cycles observed in groundwater monitoring wells across much of Harris County have fluctuated in a cyclical manner. Unfortunately, it is very difficult to align rainfall events to groundwater cycles except in a very general way. Our clayey soils tend to retard groundwater infiltration and make it difficult to correlate the data to actual events. Instead, we rely on generally rainfall trends such as drought years followed by rainy or normal years. For example, there was a significant drought in 2014 followed by normal rainfall in 2015, followed by excessive rainfall events in 2016. The drop in concentrations between December 2014/March 2015 June 2015, may be attributed to the water levels rising approximately 1.50-feet across the site. This concentration drop occurred during the period when the rainfall rates were returning to more normal levels. Between September 2015 and December 2015, water levels rose another 0.50-feet and the COC concentrations dropped again. Again, this was after a relatively wet period. The June 2016 sampling event records the lowest concentrations to date in some wells, but declining concentrations overall across the site, along with a rise in water wells of approximately 0.80-feet. The rise in water again lagging behind the torrential rains that happened at the beginning of the year.

This same cycle has been observed in the groundwater monitoring data from MW-1. The concentration starts low in 2014 and rises through March 2015. The concentration drops again through June 2015 and rises again in September 2015. As the rainfall returns to normal, the concentration again drops and then rises. Over all, the concentration of site related compounds is stable with some wells showing declining trends. The following is a discussion on a well by well basis.

- MW-1: The concentration of PCE and TCE have fluctuated in this well. From December 2014 through today, the concentration for PCE has fluctuated between 0.20 mg/L to 0.69 mg/L with the most current reading being 0.54 mg/L. The concentration for TCE has fluctuated between 0.10 mg/L to 0.20 mg/L with the most current reading being 0.098 mg/L. The concentration of the breakdown products cis 1,2 DCE and vinyl chloride also have remained stable with no evidence of accumulation of either compound.
- MW-2: The concentration of PCE and TCE have declined over time in this well. From March 2015 through today, the concentration for PCE has decreased from 0.237 mg/L to 0.029 mg/L. The concentration for TCE has decreased from 0.0349 mg/L to 0.0018 mg/L. Similar trends were observed for cis 1,2 DCE and vinyl chloride.

- MW-3: All results below the reported detection limit.
- MW-4: The concentration of PCE and TCE have fluctuated in this well similar to MW-1. However, the concentration over the past four monitoring events starting in September 2015 have consistently declined. The concentration for PCE has declined from 0.033 mg/L to 0.0064 mg/L. The concentration for TCE has declined from 0.0083 mg/L to 0.0014 mg/L. The concentration of the breakdown products cis 1,2 DCE and vinyl chloride also have declined between this period.
- MW-5: All results below the Tier 1 PCL.
- MW-6: The concentration of PCE and TCE have remained stable to declining over time in this well. From March 2015 through today, the concentration for PCE has fluctuated from 0.012 mg/L to 0.0061 mg/L with a consistent drop in the last three readings. The concentration for TCE has fluctuated from 0.0015 mg/L to 0.00079 mg/L. These results are all below the Tier 1 Residential PCL. Similar trends were observed for cis 1,2 DCE and vinyl chloride.

MW-7: All results below the Tier 1 PCL.

Overall, the site is showing stable trends as to all contaminants of concern as well as evidence that the plume is shrinking in aerial extent.

Table G1  
Summary of Groundwater Elevations  
Eco Cleaners  
2620 S. Shepherd Dr., Houston, TX 77098  
VCP No. 2628

Sampling Point ID	Gauging Date	Top-of-Casing Elevation (feet)	Depth-to-Groundwater (feet)	Total Depth (feet)	Groundwater Elevation (feet)
MW-1	7/24/13	99.66	20.96	44.70	78.70
	1/7/14		20.41	44.70	79.25
	3/12/14		20.10	44.56	79.56
	3/21/14		19.90	44.56	79.76
	4/24/14		19.96	44.56	79.70
	7/8/14		19.96		79.70
	9/5/14		20.05	44.56	79.61
	12/23/14		19.50		80.16
	3/10/15		19.04		80.62
	6/2/15		17.53		82.13
	9/2/15		17.74		81.92
	12/2/15		17.18		82.48
	3/14/16		16.99		82.67
	6/10/16		16.10		83.56
MW-2	7/24/13	99.86	21.09	49.50	78.77
	1/7/14		20.64	49.50	79.22
	3/12/14		20.34	49.50	79.52
	3/21/14		20.11	49.50	79.75
	4/24/14		20.18	49.50	79.68
	7/8/14		20.17		79.69
	9/5/14		20.25	49.50	79.61
	12/23/14		19.74		80.12
	3/10/15		19.29		80.57
	6/2/15		17.77		82.09
	9/2/15		17.94		81.92
	12/2/15		17.42		82.44
	3/14/16		17.22		82.64
	6/10/16		16.34		83.52
MW-3	7/24/13	100.00	21.18	48.95	78.82
	1/7/14		20.74	48.95	79.26
	3/12/14		20.44	49.98	79.56
	3/21/14		20.21	49.98	79.79
	4/24/14		20.29	49.98	79.71
	7/8/14		20.29		79.71
	9/5/14		20.37	49.98	79.63
	12/23/14		19.92		80.08
	3/10/15		19.37		80.63
	6/2/15		17.88		82.12
	9/2/15		18.06		81.94
	12/2/15		17.54		82.46
	3/14/16		17.30		82.70
	6/10/16		16.45		83.55

Table G1  
 Summary of Groundwater Elevations  
 Eco Cleaners  
 2620 S. Shepherd Dr., Houston, TX 77098  
 VCP No. 2628

Sampling Point ID	Gauging Date	Top-of-Casing Elevation (feet)	Depth-to-Groundwater (feet)	Total Depth (feet)	Groundwater Elevation (feet)
MW-4	3/12/14	101.67	22.13	47.95	79.54
	3/21/14		21.94	47.95	79.73
	4/24/14		21.96	47.95	79.71
	7/8/14		21.99		79.68
	9/5/14		22.04	47.95	79.63
	12/23/14	21.54		80.13	
	3/10/15	21.08		80.59	
	6/2/15	19.59		82.08	
	9/2/15	19.78		81.89	
	12/2/15	19.24		82.43	
	3/14/16	19.02		82.65	
	6/10/16	18.15		83.52	
MW-5	3/12/14	100.13	20.52	49.95	79.61
	3/21/14		20.32	49.95	79.81
	4/24/14		20.36	49.95	79.77
	7/8/14		20.35		79.78
	9/5/14		20.43		79.70
	6/2/15	100.07	18.11	52.28	81.96
	9/2/15		18.14		81.93
	12/2/15		17.65		82.42
	3/14/16		17.42		82.65
	6/10/16		16.48		83.59
MW-6	7/8/14	100.36	20.73	53.50	79.63
	9/5/14		20.79		79.57
	12/23/14		20.31		80.05
	3/10/15		19.89		80.47
	6/2/15		18.51		81.85
	9/2/15		18.53		81.83
	12/2/15		18.04		82.32
	3/14/16		17.83		82.53
6/10/16		17.00		83.36	
MW-7	7/8/14	100.88	21.27	54.58	79.61
	9/5/14		21.35		79.53
	12/23/14		20.89		79.99
	3/10/15		20.34		80.54
	6/2/15		18.89		81.99
	9/2/15		19.06		81.82
	12/2/15		18.54		82.34
	3/14/16		18.32		82.56
6/10/16		17.46		83.42	

## Appendix H

A statement as to whether contamination on and off the designated property without a Municipal Setting Designation will exceed a residential assessment level as defined in the Texas Risk Reduction Program or analogous residential level set by EPA, if known, and the basis for that statement.

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### **On the Designated Property**

As described in **Appendix D**, PCE and TCE were reported at concentrations that exceeded the TRRP residential assessment levels without a Municipal Setting Designation (<sup>GW</sup>GW<sub>Ing</sub>) in two groundwater monitoring wells. Groundwater samples collected from groundwater monitoring wells within the proposed MSD boundary reported one or more COCs (PCE, TCE, and cis-1,2-DCE) at concentrations greater than the TRRP residential ingestion exceedance level without a municipal setting designation (<sup>GW</sup>GW<sub>Ing</sub>) (**Figure C4-2** and **Figure C4-3**, **Table E2**). A review of the most recent groundwater sampling data within the proposed MSD boundary confirms these findings.

### **Off the Designated Property**

Groundwater samples collected from off-site groundwater monitoring points indicate that the area of impacted groundwater has extended beyond the limits of the proposed MSD boundary. The monitoring well (MW-4) located on the property immediately to the north of the subject property reports values of PCE above the <sup>GW</sup>GW<sub>Ing</sub> PCL. The concentration of TCE has decreased for the last four sampling events and has been below the <sup>GW</sup>GW<sub>Ing</sub> PCL for the past two events. Monitoring well MW-7 has never reported a COC concentration above a <sup>GW</sup>GW<sub>Ing</sub> PCL. The concentrations from the last six sampling events at MW-5 report levels below the <sup>GW</sup>GW<sub>Ing</sub> PCL. An attempt was made to install a delineation well on the shopping center property to the east across S. Shepherd. After several months of negotiations with the property owner, they denied InControl Technologies access to their property. On the western end of the PCLE zone, COC concentrations in MW-6 slightly exceed the Tier 1 <sup>GW</sup>GW<sub>Ing</sub> PCL. The next alternative place to install a delineation well further westward is on the next street over, Persa Street. This would place the well approximately 235-ft west of MW-6. At this point, the linear extrapolation indicates that the concentrations in a Persa Street delineation well would likely fall below the Tier 1 <sup>GW</sup>GW<sub>Ing</sub> PCL. The off-site extent of impacted groundwater is considered delineated to the residential assessment level without a MSD.