CITY OF HOUSTON

PUBLIC WORKS AND ENGINEERING
PLANNING & DEVELOPMENT DIVISION

EXECUTIVE SUMMARY

Project Overview

InControl Technologies, Inc was retained by Differential Development – 1994, Ltd. (the former property owner), to provide environmental consulting services at the Lantern Lane Shopping Center located at 12534 Memorial Drive in Houston, Harris County, Texas. The property is currently owned by amREIT Lantern Lane, LP, a Texas limited partnership. Prior to the sale of the shopping center, it was discovered that the subject property had been impacted by historical dry cleaning operations. As part of the agreement to purchase the property, Differential Development – 1994, Ltd. had to agree to mitigate environmental conditions present on the subject property. The subject property (Site) consists of approximately 6.75-acres of land located west of downtown Houston, Harris County, Texas (**Figure B1**). The subject property is developed with a retail shopping center. The former Pro Cleaners operated a dry cleaning facility in the western portion of the Lantern Lane Shopping Center. Pro Cleaners ceased dry cleaning operations in June 2007.

The subject property is located within the Buffalo Bayou Watershed (**Figure B2**). According to the Flood Insurance Rate Map (**Figure B3**) the site is located outside the 0.2% annual chance floodplain. Approximately 90% of the subject property is covered with parking spaces, walkways and retail space. The remaining 10% is covered with decorative landscaped areas.

The site currently has two PCLE zones; one in the upper groundwater bearing unit (**Figure B4-1**) and one in the lower (**Figure B4-2**).

Historical Environmental Condition

To date, Differential Development – 1994, Ltd. has undertaken extensive site investigation activities designed to define the nature and extent of the environmental impact from historical releases at the Site. The property was developed in 1962 with a multi-tenant retail shopping center. Pro Cleaners operated a dry cleaning facility from 2000 to June 2007. The Pro Cleaners tenant space was formerly occupied by a hardware store. No other dry cleaning facilities were previously located in the Lantern Lane Shopping Center.

In September 2003, McCalley, Frick & Gillman, Inc. (MFG) collected wastewater samples from the lint trap which were analyzed for volatile organic compounds (VOCs). PCE and TCE were detected in both samples indicating that dry cleaning activities had resulted in a release to the sanitary sewer. Results

from wastewater samples collected in March 2004, May 2004 and August 2004 confirmed these findings. Based on these findings the dry cleaner was required to change the dry cleaning equipment. The two PCE-based dry cleaning machines were replaced with hydrocarbons-based machines in February 2005. The hydrocarbon-based machines were in use until the dry cleaners closed in June 2007. Since that time, the dry cleaning equipment has been removed

MFG conducted a soil investigation in November 2003. Three soil borings (B-1, B-2 and B-3) were advanced outside the lease space and two soil borings (B-4 and B-5) were advanced inside the lease space (**Figure B5**). Soil samples were collected from these borings and analyzed for VOCs. Dry cleaning compounds (PCE and its breakdown products) were detected in the soil samples analyzed. The reported concentrations were less than the Tier 1 residential $^{GW}Soil_{Ing}$ PCLs (**Table F-1**). In December 2003, MFG collected groundwater samples from two temporary wells (TW-1 and TW-2) which were advanced near soil borings B-2 and B-1 respectively. The groundwater samples were analyzed for VOCs. TCE and cis-1,2-DCE were detected in the groundwater sample collected from TW-1. The reported concentration of TCE was greater than the Tier 1 residential $^{GW}GW_{Ing}$ PCL (**Table F-2**).

Environeering, Inc. installed three permanent groundwater monitoring wells (MW-1 through MW-3) (**Figure B6**) in February 2004. All three groundwater wells were sampled and the groundwater samples analyzed for VOCs. PCE and its breakdown products were identified in the groundwater sample collected from MW-3. Only TCE was reported at a concentration above the Tier 1 residential $^{GW}GW_{Ing}$ PCL (**Table F-2**).

In April 2004, five additional groundwater monitoring wells (MW-4 through MW-9) were installed and sampled. PCE, TCE and cis-1,2-DCE were reported at concentrations greater than the Tier 1 PCLs in groundwater samples collected from MW-4 and MW-5. PCE was detected at concentrations greater than the Tier 1 PCL in the groundwater samples collected from MW-6 and MW-8. During the installation of monitoring wells MW-6 through MW-8, soil samples were collected from the base of the borings and analyzed for VOCs. PCE was detected in the soil samples collected from all three wells (MW-6, MW-7 and MW-8). PCE was reported at concentrations greater than the Tier 1 residential $^{GW}Soil_{Ing}$ PCLs in soil samples collected from MW-6 and MW-8 (**Table F-1**).

Envirotest Ltd. (Envirotest) installed three additional groundwater monitoring wells (MW-9, MW-10 and MW-11) in February 2005. Soil and groundwater samples were collected and analyzed for VOCs. Acetone and TCE were reported in soil samples collected from MW-9 and MW-11. PCE and TCE were reported at concentrations greater than their respective Tier 1 $^{GW}GW_{Ing}$ PCLs in monitoring wells MW-9, MW-10 and MW-11 (**Table F-2**). Acetone was believed to be a laboratory contaminant and was disregarded as a contaminant of concern.

Envirotest installed and sampled two off-site monitoring wells (TMW-0H and TMW-B) and three angled soil borings (AB-1, AB-2 and AB-3) in March 2005. Groundwater and soil samples were analyzed for VOCs. The angled soil borings were to sample soil under the sanitary sewer line behind the Lantern Lane Shopping Center. VOCs were reported in the soil samples collected beneath the sanitary sewer line (**Table F-1**) but at concentrations below the Tier 1 $^{GW}Soil_{Ing}$ PCLs. PCE, TCE, cis-1,2-DCE and 1,1-

DCE were reported at concentrations greater than the Tier 1 $^{GW}GW_{Ing}$ PCLs in the groundwater samples collected from the two off-site temporary wells (**Table F-2**).

To further delineate impacted groundwater to the north, one permanent groundwater monitoring well (MW-12) was installed north of the shopping center in June 2005. In July 2006, three additional groundwater monitoring wells (1-MW-13, 1-MW-14 and 1-MW-15) were installed to further delineate impacted groundwater to the north and south. To vertically delineate impacted groundwater, two permanent groundwater monitoring wells (2-MW-1 and 2-MW-2) were installed in the second groundwater bearing unit. PCE was detected in the groundwater sample collected from 2-MW-1 and PCE, TCE and cis-1,2-DCE were detected in the groundwater sample collected from 2-MW-2. PCE was reported at concentrations greater than the Tier 1 residential $^{GW}GW_{Ing}$ PCL of 0.005 mg/L in both wells (**Table F-2**).

In August 2006, eleven soil borings (SB-1 through SB-11) were installed to determine if the source of the plume was the sanitary sewer line running along Tallowood Drive. Soil samples collected from these borings were analyzed for VOCs; no VOCs were detected in the soil samples (**Table F-1**).

To complete vertical delineation, SKA advanced a soil boring to a terminal depth of 78-feet below ground surface (bgs). The boring was completed as a permanent groundwater monitoring well (3-MW-1) but did not produce groundwater. The well was subsequently plugged and abandoned. COCs were not detected in the soil samples collected above (78- to 80-ft bgs) and below (115- to 117.5-ft bgs) the unsaturated sand (**Table F-1**).

To further delineate impacted groundwater in the first groundwater bearing unit, four additional groundwater monitoring wells (1-MW-16, 1-MW-20, 1-MW-21 and 1-MW-22) were installed by SKA between November and December 2006. The groundwater samples collected from these wells were analyzed for VOCs (**Table F-2**). Analytical results indicated horizontal delineation was not complete.

In February and March 2007, SKA installed three additional permanent groundwater monitoring wells (2-MW-3, 2-MW-4 and 2-MW-5) in the second groundwater bearing unit. PCE was reported at concentrations greater than the Tier 1 $^{GW}GW_{Ing}$ PCL in all three wells. To further delineate groundwater in the second GWBU, monitoring well 2-MW-6 was installed. PCE was reported at a concentration greater than the Tier 1 $^{GW}GW_{Ing}$ PCL in this well. In October 2007 monitoring well 2-MW-7 was installed in the second groundwater bearing unit to complete delineation to the south. No COCs were detected in the groundwater sample collected from 2-MW-7. Groundwater monitoring well 2-MW-8 was installed in November 2007 to complete delineation in the second groundwater bearing unit to the east. No COCs were detected in the groundwater sample collected from 2-MW-8. In December 2007, groundwater monitoring well 2-MW-9 was installed to complete delineation to the west in the second GWBU. PCE and TCE were reported at concentrations greater than the Tier 1 $^{GW}GW_{Ing}$ PCL in this well. Three additional groundwater monitoring wells (2-MW-10, 2-MW-11 and 2-MW-12) were installed in February and March 2008 to complete delineation in the second GWBU to the south and west (**Table F-2**).

The lateral extent of groundwater impact has been horizontally delineated in all directions. The first groundwater bearing unit is delineated in the upgradient direction by groundwater monitoring wells 1-MW-

12 and 1-MW-17 and by groundwater monitoring wells 1-MW-18, 1-MW-19, 1-MW-20 and 1-MW-22 in downgradient direction (**Figure B4-1**). Groundwater monitoring wells 1-MW-1, 1-MW-7 and 1-MW-16 are the crossgradient delineation points in the first groundwater bearing unit. The second groundwater bearing unit is delineated by groundwater monitoring wells 2-MW-7 and 2-MW-12 in the downgradient direction (**Figure B4-2**).

A comparison of the sampling results from as early as February 2004 through March 2008 indicates that the area of impact has remained stable over time. Monitoring wells 1-MW-9 and 2-MW-2 have historically reported the highest COC concentrations. COC concentrations in monitoring well 1-MW-9 have decreased over the sampling history of the site and have remained stable in monitoring well 2-MW-2 over the sampling history of the site. Compound specific PCLE zones are depicted in **Figure B8-1** through **Figure B8-4**. The groundwater gradient at the site it to the southwest in both the upper (**Figure B7-1**) and lower (**Figure B7-2**) groundwater bearing units.

Six (6) water wells were identified within a ½-mile radius of the proposed MSD boundary. Three (3) of the six (6) identified water wells are listed as domestic wells and one (1) is listed as a public supply well. It is suspected that two (2) of the three (3) domestic water wells are in fact the same well. One (1) of the six (6) water wells is listed as "plugged". The nearest domestic well is located almost 800-feet northwest (upgradient) from the proposed MSD boundary. This well is completed at a depth of 390-feet bgs and screened from 330- to 370-ft bgs. This well is drawing water from a zone much deeper than the impacted zone at the Lantern Lane Shopping Center. The nearest public water supply well is located greater than 2,000-feet west (cross-gradient) from the proposed MSD boundary. The public water supply well is owned by the Grimes Grass Co. Completion information was not available for this well but it is anticipated that the well is drilled to a depth much deeper than the impacted zones at the Lantern Lane Shopping Center. There are no sensitive receptors within 500-feet of the proposed MSD boundary. The nearest receptor is an unnamed creek located approximately 615-feet west of the proposed MSD boundary followed by Buffalo Bayou located greater than 1-mile 1,700-feet southwest of the proposed MSD boundary.