Phase 2 Groundwater RFI Report for DuPont Oakley Site

EXECUTIVE SUMMARY

This Phase 2 Groundwater Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the E. I. du Pont de Nemours and Company (DuPont) Oakley Site (formerly the DuPont Antioch Works) has been prepared to fulfill the requirements of the Corrective Action Consent Agreement (CACA, Section AN-12) issued by the Department of Toxic Substances Control (DTSC; effective date June 17, 2003). The report was prepared in accordance with Attachment 3.B. of the CACA. It presents results collected during execution of the various Phase 2 Groundwater RFI activities and includes a detailed evaluation of the existing site data. The investigations completed as part of the Phase 2 Groundwater RFI followed work plans developed individually for each of the tasks and generally followed the standard operating procedures for fieldwork outlined in the Phase 1 Groundwater RFI Work Plan (DuPont Corporate Remediation Group [CRG], 2003a). Reports were prepared and submitted to DTSC for the completed investigations. The individual work plans and completion reports are cited in this report in the summary sections for those activities.

DuPont intends to conduct the Groundwater RFI process at the Oakley Site through three phases of investigation. The third phase of the investigation may be completed in conjunction with the Corrective Measures Study (CMS). Consequently, the Phase 2 Groundwater RFI Report is the second of the three reports that DuPont intends to submit under the CACA Groundwater RFI process. This report is intended to serve as a comprehensive analysis of all site data collected through December 2007. The limited additional investigation work completed after December 2007 (including various groundwater monitoring events) are not factored into this evaluation. The analysis provides a basis for updating the conceptual site model (CSM) describing the degree and extent of COPCs at the site, the trend in site COPC data, and the effect of remedial efforts at work at the site. Key points regarding the Phase 2 Groundwater RFI Report are summarized below.

The Phase 2 Groundwater RFI Report focuses on adding information gathered from Phase 2 RFI investigations completed through 2007 to the previously existing data set to allow a thorough evaluation of current conditions at the site. The report also summarizes activities completed to satisfy data gaps identified in the Phase 1 Groundwater RFI Report. An updated review of data gaps is presented in Table 1-1. Overall, the objectives for the Phase 2 Groundwater RFI field activities were to:

- Collect detailed information to characterize the western and central portions of Plume 1
- Collect data to allow an evaluation of the interim remedial measure Permeable Reactive Barrier (PRB) with Enhanced Anaerobic Biodegradation (EAB) in the Upper and Lower Aquifers downgradient of the former Carbon Tetrachloride (CT) release area

- Collect information in the Plume 1 area to refine the understanding of the groundwater flow and delineate the plume distribution
- Continue the delineation of the extent and degree of site impacts associated with the various constituents of potential concern (COPCs) in Plumes 2 and 3.

The report accomplishes the following:

- Activities completed subsequent to April 2004 (Phase 1 Groundwater RFI Report – DuPont CRG, 2008a) are addressed, and data obtained through the fourth quarter 2007 ground water monitoring event is included (these investigations were previously reported to DTSC and therefore only brief discussions are included).
- Analyses of the location and concentration of COPCs in each of the three plumes and four aquifers and COPC data trends through time are included, as well as an evaluation of the transport of COPCs both vertically and horizontally.
- The CSM is updated to discuss each COPC on an individual basis, setting the stage for the CMS.
- Data gaps for further evaluation are discussed.
- The Environmental Visualization System (EVS) software model has been revised to limit the subsurface layering to the primary site aquifers and aquitards. The updated model includes: the Surficial Aquifer, Upper Aquifer, Lower (L1) Aquifer, Lower (L2) Aquifer, Lower (L3) Aquifer, Surficial/Upper Aquitard (S/U), Upper/Lower Aquitard (U/L), and Montezuma Formation. The updated EVS model allows site data to be portrayed in a clear manner that also demonstrates current site knowledge.
- The discrete groundwater data set has been combined with recent groundwater monitoring and surface water monitoring data (through 4Q2007) to develop plume maps for each COPC and aquifer at the site. The plume maps consist of two sets of plume contours including the plumes depicted in the 2007 Annual Groundwater Monitoring Report (based on data from groundwater monitoring wells only) and plumes based on a full groundwater sample data set (includes discrete groundwater sample results). The plume maps based on the full data set represent the most comprehensive maps completed to date and provide a significant refinement of the CSM for each of the site COPCs.
- COPC plume maps have been compared to the Phase 2 membrane interface probe system (MIPs) data and the GORE-SORBER® data to identify if there are any additional areas at the site where these semi-quantitative data indicate the presence of site COPCs.
- General chemistry and COPC daughter product data have been evaluated to allow an initial evaluation of the state of natural attenuation at the site.

The site has been inactive since 1999, and all of the former manufacturing or handling facilities have been demolished. As a result, there are no new sources of site COPCs contributing to the concentrations observed in groundwater. The evaluation therefore assumes that the only sources contributing to groundwater impacts downgradient of former release areas are residual COPCs in

saturated and unsaturated soil and sorbed COPCs in the site aquifers and aquitards. Based on the evaluation presented in this report for the site COPCs, the following conclusions can be made about their current distribution at the site, their migration following release, the current trends in concentration, and their anticipated fate.

- CT – This COPC is present primarily in Plumes 1 and 2 in the Surficial Aquifer and in Plume 1 in the underlying aquifers as well. The concentration in Plume 1 is significantly higher than in Plume 2 and is several orders of magnitude greater than the site groundwater water quality objective (WQO) of 0.1 micrograms per liter (µg/L). CT in the plumes appears to originate near the intersection of Sixth Street and "B" Avenue (for Plume 1) and in the vicinity of the former TEL Ponds and Wood-lined Trench (for Plume 2). The exact release point for CT has not been identified. The CT in Plume 1 appears to migrate downward from the Upper to the Lower (L1/L2) Aquifer as it moves downgradient, extending to the San Joaquin River in the Lower (L1/L2 and L3) Aquifers. CT extends to Little Break in the Surficial Aquifer of Plume 2, but is detected in only two, isolated monitoring wells, indicating either attenuation of the plume in this portion of the site or multiple or intermittent releases.

  Concentration trends in the Surficial and Upper Aquifers are stable to decreasing, with the decreasing trends indicating attenuation of the plume. Concentration trends in the Lower Aquifers are mixed with increasing, stable, and decreasing concentrations. Many of the increasing trends are located in downgradient portions of the site, suggesting continuing downgradient migration of a higher relative concentration pulse of CT in these aquifers. CT is degrading as it passes through the PRB wall. Further evaluation of the effectiveness of the PRB wall and associated EAB will be completed during the CMS and the Phase 3 RFI process.

  The CT plumes that do not currently reach the downgradient margins of the site appear to be stable. The plumes that do extend to surface water bodies are bounded on the downgradient margin where the associated aquifer and surface water bodies intercept. Tidal action is believed to be one factor aiding in attenuation of the plume at the groundwater-surface water interface, as demonstrated by the lack of detections of CT in the surface water and flux chamber samples.

- Tetrachloroethene (PCE) – This COPC is present in Plumes 1, 2, and 3 in the Surficial and Upper Aquifers and primarily in Plumes 1 and 2 in the Lower (L1/L2 and L3) Aquifers. PCE is observed in a very limited area in the Lower (L1/L2 and L3) Aquifers of Plume 3 and is not considered to be an issue of concern in this portion of the site. PCE concentrations are approximately the same in all three plumes and range up to three orders of magnitude greater than the WQO (5 µg/L) in the Surficial and Upper Aquifers. PCE in the plumes appears to originate in the vicinity of the Sixth Street and "B" Avenue intersections in Plume 1, in the vicinity of the former TEL Ponds and Wood-lined Trench in Plume 2, and in the vicinity of the former TiO_2 Manufacturing Area/North and South Retention Ponds and associated Wood-lined Trench in Plume 3. The exact release point of PCE has not been identified. PCE in Plume 1 appears to have migrated downgradient in the Upper

Aquifer to the southeastern corner of the Lauritzen Yacht Harbor. The PCE plume appears to move downward from the Surficial to the Upper Aquifer in Plume 2 as it moves downgradient, extending to Little Break. The plumes are smaller in the Lower (L1/L2 and L3) Aquifers of Plume 2, indicating either attenuation of PCE as it moves downward or limited migration of PCE to the Lower (L1/L2 and L3) Aquifers.

Concentration trends are mostly stable or decreasing in the Surficial and Lower (L1/L2 and L3) Aquifers. Concentration trends are mixed in the Upper Aquifer with increasing, stable, and decreasing trends. Increasing trends in the Upper Aquifer are located along the downgradient margins of the site near the Lauritzen Yacht Harbor and Little Break, suggesting that a higher relative concentration pulse of PCE continues to migrate downgradient in these areas. Recent surface water samples from the Lauritzen Yacht Harbor area contained PCE, indicating that the plume has intercepted the harbor.

Generally, the plumes that do not currently reach the downgradient margins of the site appear to be stable. The plumes that do extend to surface water bodies are bounded on the downgradient margin where the associated aquifer and surface water bodies intercept. Tidal action is believed to be one factor aiding in attenuation of the plume at the groundwater-surface water interface, as demonstrated by the lack of detections of PCE above the site WQO in surface water and the lack of detections of PCE in the flux chamber samples.

- 1,2-Dibromoethane (1,2-DBA) – This COPC is present primarily in Plume 2 in each of the aquifers at the site. The concentration of 1,2-DBA ranges up to several orders of magnitude greater than the WQO (0.05 µg/L). The main 1,2-DBA plume appears to originate in the vicinity of the former TEL ponds and Wood-lined Trench. The exact release point for the 1,2-DBA has not been identified. The plume appears to have moved downward from the Surficial to the Upper Aquifer as it moves downgradient, where it extends to Little Break. The plume appears to be smaller in the Lower (L1/L2 and L3) Aquifers, as a result of either attenuation or limited migration of the COPC and does not extend to the downgradient property boundary in these aquifers. The concentrations in monitoring wells in all four aquifers are stable or decreasing through time, indicating that the COPC is attenuating within the aquifer.

  Tidal action is believed to be one factor aiding in attenuation of the plume at the groundwater-surface water interface in the Upper Aquifer where Plume 2 intersects surface water in Little Break, as demonstrated by the lack of detections of 1,2-DBA in the surface water and flux chamber samples. The plumes in the Surficial and Lower (L1/L2 and L3) Aquifers do not currently reach the downgradient margins of the site and appear to be stable.

- 1,2-Dichloroethane (1,2-DCA) – This COPC is present primarily in Plumes 1 and 2 in two distinct plumes. The concentration of 1,2-DCA is approximately equal in both plumes and ranges up to several orders of magnitude greater than the WQO (0.5 µg/L). The 1,2-DCA plumes appear to originate from two separate source areas, one located in the vicinity of the corner of Sixth Street and "B" Avenue and the other

in the vicinity of the former TEL ponds. A third source area may have been present south of the former West, East, and Emergency Basins. The exact release point(s) of 1,2-DCA are not known. 1,2-DCA appears to have migrated downward from the Surficial to Lower (L3) Aquifer as it moved downgradient, and in some cases extends to Little Break and the San Joaquin River.

In general, the concentration of 1,2-DCA in all aquifers is either stable or decreasing through time, indicating that the COPC is attenuating within the aquifer. The 1,2-DCA concentrations in Plume 1 extend to the downgradient margins of the site at the San Joaquin River in the Upper and Lower (L3) Aquifers. 1,2-DCA in Plume 1 of the Lower (L1/L2) Aquifer does not appear to extend to a surface water body and appears to be stable due to the non-detect values observed in wells along the downgradient margin of the site. However, the data in the wells along the downgradient margin of the site in the Lower (L1/L2) Aquifer have elevated non-detect values that may be masking the presence of 1,2-DCA. The 1,2-DCA concentrations in Plume 2 extend to the downgradient margins of the site at Little Break in all four of the site aquifers. The plumes that do extend to surface water bodies are bounded on the downgradient margin where the associated aquifer and surface water bodies intercept. Tidal action is believed to be one factor aiding in attenuation of the plume at the groundwater-surface water interface, as demonstrated by the lack of detections of 1,2-DCA in the surface water and flux chamber samples.

- Trichlorofluoromethane (CFC-11) – This COPC is present primarily in Plume 1 and appears to originate in the Freon Manufacturing Area. The exact release point for CFC-11 has not been identified. The concentration of CFC-11 ranges up to two orders of magnitude greater than the WQO (150 µg/L). The CFC-11 plume appears to move downward from the Upper to the Lower (L3) Aquifer as it moves downgradient. Concentration trends are mostly stable in the Surficial Aquifer, but some increasing trends are observed in the Upper and Lower (L1/L2 and L3) Aquifers, suggesting that a higher relative concentration pulse of CFC-11 may continue to migrate downgradient in these aquifers.

  The CFC-11 plume in the Surficial Aquifer appears to be stable, with most wells exhibiting stable concentration trends and no increasing trends along the downgradient margin of the plume. The CFC-11 plume in the Upper Aquifer includes two wells with increasing concentrations along the downgradient margin of the site in the vicinity of the Lauritzen Yacht Harbor. The increasing concentration trends in these wells are an indication that the plume is expanding downgradient in the aquifer within the southern portion and along the eastern border of the Lauritzen Yacht Harbor, intercepting the Lauritzen Yacht Harbor. Surface water samples from the Lauritzen Yacht Harbor area contain CFC-11. Increasing concentrations are observed along the San Joaquin River in the Lower (L1/L2 and L3) Aquifers. The plumes that do extend to surface water bodies are bounded on the downgradient margin where the associated aquifer and surface water bodies intercept. Tidal action is believed to be one factor aiding in attenuation of the plume at the groundwater-surface water interface, as demonstrated by the lack of detections of CFC-11 above

the site WQO in the surface water and the lack of detections of CFC-11 in the flux chamber samples.

- 1,1,2-Trichlorotrifluoroethane (CFC-113) – This COPC is present at concentrations greater than the site WQO (1,200 µg/L) primarily in Plume 1 and appears to originate largely in the CFC-113 Spill and CFC-113 Tank Farm areas where reported releases of CFC-113 occurred in the 1970s and 1980s. The concentration of CFC-113 ranges up to two orders of magnitude greater than the WQO. CFC-113 is observed in Plume 2 at concentrations less than the site WQO in the vicinity of, and downgradient of the former TEL Ponds and associated Wood-lined Trench. The CFC-113 in Plume 1 appears to move downward from the Surficial Aquifer to the underlying layers as it moves downgradient.

  Concentration trends in all four aquifers show a mixture of increasing, stable, and decreasing trends, with many of the increasing trends located at the downgradient margins of the site. The concentration trend data suggests that a higher relative concentration pulse of CFC-113 may be migrating downgradient. The CFC-113 plume has demonstrated increasing concentration trends in three Surficial Aquifer wells. The increasing concentration trends in these wells are an indication that the plume may be expanding downgradient in the aquifer in the vicinity of the southeast corner of the Lauritzen Yacht Harbor. CFC-113 is currently detected in surface water samples in the Lauritzen Yacht Harbor, indicating that the plumes in the Surficial and Upper Aquifers intercept the harbor. Increasing concentrations are observed in monitoring wells along the San Joaquin River in the Lower (L1/L2 and L3) Aquifers of Plume 1. Increasing concentration trends in Plume 2 of the Upper Aquifer are not considered to be a concern since there are no detections of CFC-113 in the plume that are greater than the site WQO. The plumes in Plume 1 and Plume 2 are bounded on the downgradient margin where the associated aquifer and surface water bodies intercept. Tidal action is believed to be one factor aiding in attenuation of the plumes at the groundwater-surface water interface, as demonstrated by the lack of detections of CFC-113 at concentrations greater than the WQO in the surface water and lack of detections of CFC-113 in the flux chamber samples.

- Organolead – This COPC is present primarily in Plumes 1 and 2. The concentration of organolead ranges up to two orders of magnitude greater than the WQO (0.0007 µg/L). Organolead in Plume 1 appears to originate in one of three areas at the site including the upgradient former Building 10 TEL Manufacturing Area, various former TEL manufacturing and blending areas immediately north of Sixth Street, and the former Basins Cleanup Loading Area. The exact release point for organolead has not been identified. The organolead plume in Plume 1 appears to reduce in size and concentration with depth and does not appear to be migrating downgradient. Organolead in Plume 2 appears to originate in the vicinity of former TEL ponds B and C and the Wood-lined Trench. The organolead plume in Plume 2 moves downward from the Surficial to the Upper Aquifer as it migrates and expands downgradient, extending to Little Break. The organolead plume appears to decrease in size and concentration as it moves from the Upper Aquifer to the Lower (L1/L2 and L3) Aquifers.

Concentration trends are predominantly stable or decreasing in the plumes. One increasing trend is observed in the Upper Aquifer of Plume 2, indicating that a higher relative concentration pulse of organolead may be migrating downgradient. Tidal action is believed to be one factor aiding in attenuation of the plumes at the groundwater-surface water interface, as demonstrated by the lack of detections of organolead in the surface water and flux chamber samples.

- Lead – This COPC is present at concentrations greater than the site WQO primarily in Plumes 1 and 2, with lead in Plume 2 extending to Little Break. The concentration of lead ranges up to two orders of magnitude greater than the WQO (15 µg/L). The location of the lead plume in Plume 1 appears to move downward from the Surficial to the Lower (L3) Aquifer as it migrates downgradient, where it extends to the San Joaquin River. Lead in Plume 1 appears to originate from several potential sources in the vicinity of the former TEL manufacturing and blending areas. Lead in Plume 2 appears to originate in the vicinity of former TEL Ponds B and C and the Wood-lined Trench. The lead plume in Plume 2 extends to Little Break in the Surficial and Upper Aquifers and expands as it moves to the Upper Aquifer. The lead plume becomes smaller in the Lower (L1/L2 and L3) Aquifers of Plume 2 and does not extend to Little Break. The exact release point for lead in the plumes has not been identified.

  Concentration trends in most aquifers are predominantly stable or decreasing, indicating attenuation of the plumes. However, increasing trends in the Lower (L3) Aquifer of Plume 1 indicate that a higher relative concentration pulse of lead may be continuing to migrate downgradient. Tidal action is believed to be one factor aiding in attenuation of the plumes at the groundwater-surface water interface, as demonstrated by the lack of detections of lead in recent surface water samples and the lack of detections of lead in the flux chamber samples at concentrations greater than the baseline surface water samples during the flux chamber investigation.

- Arsenic – This COPC is present at concentrations greater than the WQO (10 µg/L) in Plumes 1, 2, and 3 in the Surficial, Upper, and Lower (L1/L2) Aquifers and is present in Plumes 1 and 2 in the Lower (L3) Aquifer. Arsenic is a known byproduct of the CFC manufacturing process and can also be mobilized due to low ORP. The concentration of arsenic ranges up to one order of magnitude greater than the WQO. In the Surficial Aquifer, the arsenic appears to originate in the vicinity of the various TEL manufacturing areas and the Railcar Load/Unloading Area. Higher concentrations of arsenic are also observed in the vicinity of the former Emergency Basin. The exact release points for arsenic have not been identified. Arsenic in the Surficial Aquifer appears to extend to the downgradient margin of the site in the vicinity of the Lauritzen Yacht Harbor. In the Upper Aquifer, the plume extends to the downgradient margin of the site in Plumes 1, 2, and 3. In the Lower (L1/L2 and L3) Aquifers, the arsenic plume appears to have decreased in size and concentration compared to the overlying aquifers, but still extends to the downgradient margins of the site.

  The concentration trends of arsenic in the Surficial Aquifer are predominantly stable. The Upper Aquifer has a mixture of increasing, stable, and decreasing concentration

trends. The increasing trends appear primarily in the northern portion of Plume 2. The increasing trend in monitoring wells in the Upper Aquifer suggests that arsenic is moving downward from the Surficial to the Upper Aquifer as it migrates downgradient. Concentration trends in the Lower (L1/L2 and L3) Aquifers are primarily stable or decreasing, consistent with the smaller size of the plumes in these aquifers compared to the overlying layers. Tidal action is believed to be one factor aiding in attenuation of the plumes at the groundwater-surface water interface, as demonstrated by the lack of detections of arsenic in the surface water samples.

- Fluoride – This COPC is present at concentrations greater than the site WQO primarily in Plume 1. The concentration of fluoride ranges up to one order of magnitude greater than the WQO (2,000 µg/L). The plume appears to be centered in the vicinity of the former Emergency Basin and the West and East Basins in the Surficial and Upper Aquifers. Fluoride is present mostly in the PRB wall area and the former Basins Cleanup Loading Area in the Lower (L1/L2 and L3) Aquifers. The plume is smaller in the Lower (L1/L2 and L3) Aquifers than in the overlying layers. The exact release points for fluoride have not been identified.

  Concentration trends in the Surficial Aquifer are mixed with increasing, stable, and decreasing concentrations. Most of the groundwater monitoring locations have stable concentrations, consistent with the localized nature of the plume. Concentration trends in the Upper Aquifer are also mixed; however, there are many more wells with increasing trends. Concentration trends in the Lower (L1/L2 and L3) Aquifers are also mixed, with increasing trends occurring in the PRB wall area and along the downgradient margins of Plume 1. Although there is not a perfect correlation between declining CFC concentrations and increasing fluoride concentrations for many of the wells in the PRB area, it is possible that the increasing fluoride concentrations in the vicinity of the PRB wall are a result of the degradation of CFCs by the PRB. CFC concentrations in some wells in the vicinity of the PRB have been on a declining trend. Fluoride is present in many groundwater monitoring wells located along the downgradient margins of the site near surrounding surface water bodies; however, the concentrations are less than the site WQO in these wells. Tidal action is believed to be one factor aiding in attenuation of the plumes at the groundwater-surface water interface.

General chemistry parameters were evaluated to identify if site conditions are favorable for reductive dechlorination of many of the site COPCs. Review of the data indicates the following about the potential for groundwater remedies that would take advantage of biological reductive dechlorination as a means to remediate the site:

- pH and dissolved oxygen are within ranges considered optimal for anaerobic biodegradation of chlorinated organic compounds
- Terminal electron acceptors (nitrate, iron, and manganese) are reduced to varying degrees, providing evidence that biological processes are active at the site
- Oxidation-reduction potential is low (low positive to negative) indicating conditions that favor reductive dechlorination of chlorinated organic compounds

- Dissolved oxygen concentrations are low indicating conditions favorable for anaerobic biodegradation of chlorinated organic compounds
- The rate of anaerobic biodegradation appears to be limited due to low concentrations of total organic carbon; additional evaluation is necessary to identify if greater concentrations of total organic carbon would enhance rates of biodegradation
- The presence of daughter products of chlorinated compounds is an indication that COPCs at the site are naturally biodegrading at the site
- The presence of microbes capable of dechlorinating organic molecules is further evidence indicating that site COPCs are being actively degraded at the site

The tidal modeling study completed for the Oakley Site has calculated that concentrations of site COPCs in groundwater from the Upper Aquifer and Lower (L1/L2 and L3) Aquifers will be reduced significantly as a result of tidal attenuation. The model predicts the following reductions in concentration of the site COPCs:

- Volatile organic compounds (VOCs) from the Upper Aquifer are reduced in concentration by a factor of greater than 86
- Inorganic compounds from the Upper Aquifer are reduced in concentration by a factor of greater than 1,000
- VOCs from the Lower (L1/L2 and L3) Aquifers are reduced in concentration by a factor of greater than 3.34
- Inorganic compounds from the Lower (L1/L2 and L3) Aquifers are reduced in concentration by a factor of greater than 124

The delineation of the COPC plumes at the site is essentially complete for the purposes of evaluation for a CMS. Several areas may require additional minor delineation along the margins of the plumes to complete the groundwater monitoring well network or to resolve questions identified during the CMS. Areas where delineation through the installation of additional groundwater monitoring wells may be valuable are listed below:

1) A cluster of wells in the TiO_2 Manufacturing Area in the Surficial and Upper Aquifers to evaluate potential impacts by PCE. CT has also been detected in the TiO_2 Manufacturing Area in historical discrete groundwater samples, but has not been observed in existing groundwater monitoring wells in the same general vicinity. Since historical information indicates that CT was also used in the area, any new groundwater monitoring wells installed in the TiO_2 Manufacturing Area should also be evaluated for CT.
2) A cluster of wells in the area between the Retention Ponds and TEL Pond C in the Surficial, Upper, and Lower (L1/L2) Aquifers to evaluate potential impacts by PCE, 1,2-DCA, lead, and organolead
3) A cluster of wells in the block bounded by Fifth and Sixth Streets and “B” and “C” Avenues in all four aquifers to delineate the upgradient margin of 1,2-DCA, lead, organolead, and arsenic

4) One well in the block bounded by Fifth and Sixth Streets and "B" and "C" Avenues, south of the former Building 10 TEL Manufacturing Area in the Surficial Aquifer and south of the well cluster listed above, to delineate the upgradient margin of lead and organolead.
5) A cluster of wells in the block bounded by Fifth and Sixth Streets and "A" and "B" Avenues in the Upper, Lower (L1/L2), and Lower (L3) Aquifers to delineate the upgradient margin and/or verify high concentration detections in discrete samples of CT, PCE, 1,2-DCA, CFC-11, CFC-113, lead, and organolead
6) An additional well in the vicinity of existing monitoring well PZ-31 near the Central Slough in the Lower (L1/L2) Aquifer to delineate the eastern margin of the CT, PCE, 1,2-DCA, CFC-11, and CFC-113 plumes
7) An additional well near the southeast corner of the Lauritzen Yacht Harbor near existing monitoring well MW-66 in the Lower (L1/L2) Aquifer to monitor the northwest extent of the CT, CFC-11, and CFC-113 plumes
8) An additional well along the eastern side of Plume 3 near Little Break and existing monitoring well MW-77 in the Surficial Aquifer to delineate the eastern extent of the PCE plume
9) An additional well immediately north of the Cline Vineyard Property in the Surficial Aquifer to monitor the southern extent of the PCE in Plume 3
10) A pair of additional wells to the north of Seventh Street and west of "B" Avenue in the Lower (L1/L2) and Lower (L3) Aquifers to evaluate for site COPCs between upgradient and downgradient well locations where no data from groundwater monitoring wells exists (many of the plume maps depict an upgradient plume and a downgradient plume with only limited data to evaluate if the plumes are connected)
11) An additional well near existing monitoring well LF-05 in the Upper Aquifer to evaluate the presence of organolead and lead where high concentrations were detected in discrete sample locations