

**Five-Year Review Report**

**Third Five-Year Review Report  
for**

**Piper Aircraft Corp./Vero Beach Water and Sewer Department Site  
FLD004054284**

**Vero Beach  
Indian River County, Florida**

May 2014

United States Environmental Protection Agency  
Region 4  
Atlanta, Georgia

Approved by:



Franklin E. Hill, Director  
Superfund Division

Date:

5/5/14



**Third Five-Year Review Report  
for  
Piper Aircraft Corp./Vero Beach Water & Sewer Department  
2926 Piper Drive  
Vero Beach  
Indian River County, Florida**

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## List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CIC	Community Involvement Coordinator
CFR	Code of Federal Regulations
COC	Contaminant of Concern
1,2-DCE	cis-1,2-Dichloroethene
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FYR	Five-Year Review
IC	Institutional Control
MCL	Maximum Contaminant Level
µg/L	micrograms per liter
MW	Monitoring Well
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TCE	Trichloroethene
UST	Underground Storage Tank
UVB	Unterdruck-Verdampfer-Brunnen
VBWSD	Vero Beach Water & Sewer Department
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound

## **Executive Summary**

The Piper Aircraft Corp./Vero Beach Water & Sewer Department Superfund site (the Site) is located near the eastern coast of central Florida, in the City of Vero Beach, Indian River County. Ground water beneath the Site is contaminated primarily by volatile organic compounds (VOCs), trichloroethene (TCE) and its degradation products, cis-1, 2-dichloroethene (1,2-DCE), 1, 1-dichloroethene and vinyl chloride. The contamination came from an underground storage tank (UST) leaking TCE. The surrounding area is primarily commercial and industrial properties.

The United States Environmental Protection Agency (EPA) addressed the Site as one Operable Unit (OU). EPA approved a remedy for the Site in a Record of Decision (ROD) signed on December 23, 1993. The remedy includes ex-situ treatment of ground water and institutional controls.

The ROD did not specifically spell out remedial action objectives (RAOs), but states that ground water treatment is intended to protect human health and the environment by reducing or preventing further migration of the contaminated ground water and by reducing the contaminant concentrations in ground water until the concentrations are less than or equal to the performance standards.

The remedial actions continue to operate and function as designed, though the contaminant levels are not yet below maximum contaminant levels (MCLs). The ground water treatment system continues to function as designed, but the potentially responsible party (PRP), has begun exploring opportunities for optimization to expedite cleanup, such as bioremediation. The Site's institutional controls have been established and are sufficient for preventing exposure to contaminated ground water.

The potential for vapor intrusion exists at the site, but no vapor intrusion assessment had been completed during the last five-year period. During this five-year review (FYR), the first level screening was completed using the most recent EPA vapor intrusion screening level (VISL) calculator and the maximum contaminant concentrations detected in December 2013. The results indicate the December 2013 concentrations do not exceed EPA's acceptable risk levels for commercial use. EPA and the PRPs are still considering additional methods to more precisely determine any potential vapor intrusion risk posed to the workers at the Site. Florida Department of Environmental Protection (FDEP) has also requested a direct-push technology system installation in Building #4 to optimize remedial efforts and ensure that cleanup eliminated all source materials.

The remedy currently protects human health and the environment, because exposure to contaminated ground water is prevented through the implementation of institutional controls and the first level screening of vapor intrusion indicated that current contaminant levels are within an acceptable risk range. However, in order for the remedy to be protective in the long term, a site-specific vapor intrusion assessment may still be needed to ensure protectiveness since the contaminant concentrations tend to fluctuate.

## Five-Year Review Summary Form

SITE IDENTIFICATION		
<b>Site Name:</b> Piper Aircraft Corp./Vero Beach Water & Sewer Department		
<b>EPA ID:</b> FLD004054284		
<b>Region:</b> 4	<b>State:</b> FL	<b>City/County:</b> Vero Beach/Indian River County
SITE STATUS		
<b>NPL Status:</b> Final		
<b>Multiple OUs?</b> No	<b>Has the site achieved construction completion?</b> Yes	
REVIEW STATUS		
<b>Lead agency:</b> EPA If "Other Federal Agency" selected above, enter Agency name: N/A		
<b>Author name:</b> Ryan Burdge and Sarah Alfano (Reviewed by EPA)		
<b>Author affiliation:</b> Skeo Solutions		
<b>Review period:</b> 10/2013 – 5/2014		
<b>Date of site inspection:</b> 1/7/2014		
<b>Type of review:</b> Policy		
<b>Review number:</b> 3		
<b>Triggering action date:</b> 05/05/2009		
<b>Due date (five years after triggering action date):</b> 05/05/2014		

**Five-Year Review Summary Form (continued)**

**Issues/Recommendations**

**Issues and Recommendations Identified in the Five-Year Review:**

<b>OU 1:</b> <a href="#">Click here to enter text.</a>	<b>Issue Category: Remedy Performance</b>			
	<b>Issue:</b> The PRPs have not completed a site-specific vapor intrusion assessment.			
	<b>Recommendation:</b> Conduct a site-specific vapor intrusion assessment in accordance with the most recent EPA vapor intrusion guidance.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA	5/12/2015

**Sitewide Protectiveness Statement**

<i>Protectiveness Determination:</i> Short-term Protective	<i>Addendum Due Date (if applicable):</i> N/A
<i>Protectiveness Statement:</i> The remedy currently protects human health and the environment, because exposure to contaminated ground water is prevented through the implementation of institutional controls and the first level screening of vapor intrusion indicated that current contaminant levels are within an acceptable risk range. However, in order for the remedy to be protective in the long term, a site-specific vapor intrusion assessment may still be needed to ensure protectiveness since the contaminant concentrations tend to fluctuate.	

**Five-Year Review Summary Form (continued)**

**Environmental Indicators**

-Current human exposures at this site are under control.  
-Contaminated ground water migration is under control.

**Are Necessary Institutional Controls in Place?**

All  Some  None

**Has EPA Designated the Site as Sitewide Ready for Anticipated Use?**

Yes  No

**Has the Site Been Put into Reuse?**

Yes  No (Site remains in continued industrial use by Piper Aircraft)



**Third Five-Year Review Report  
for  
Piper Aircraft Corp./Vero Beach Water and  
Sewer Department Superfund Site**

**1.0 Introduction**

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo Solutions, an EPA Region 4 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the Piper Aircraft Corp./Vero Beach Water and Sewer Department Superfund site (the Site) in Vero Beach, Indian River County, Florida. EPA Region 4's contractor conducted this FYR from October 2013 to May 2014. EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP) financed cleanup at the Site. FDEP, as the support agency representing the State of Florida, has reviewed all supporting documentation and provided input to EPA during the FYR process.

This is the third FYR for the Site. The triggering action for this policy review is the previous FYR, signed on May 5, 2009. The FYR is required due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit (OU), which is addressed in this FYR report.

## 2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

**Table 1: Chronology of Site Events**

Event	Date
Piper Aircraft Corporation (Piper Aircraft) installed a trichloroethene (TCE) tank and supply system on site	1975
Vero Beach Water & Sewer Department (VBWSD) detected TCE in municipal supply well, CVB-15	October 1978
City of Vero Beach and Piper Aircraft developed pump & treat system under Florida Department of Environmental Regulation (FDER) oversight	March 1979
Site operators installed a dewatering well	August 1, 1980
Piper Aircraft signed Consent Agreement for remediation of TCE. Pump-and-treat system operations began.	October 1981
FDEP began preliminary assessment	October 1, 1984
EPA proposed the Site to the National Priorities List (NPL)	June 10, 1986
Piper Aircraft removed the underground storage tank (UST) and contaminated soil in the spill area, treated the soil, and returned it to the excavated area	June 1989
EPA finalized the Site on the NPL	February 21, 1990
EPA notified Piper Aircraft of potential liability and necessary investigative activities at the Site	October 21, 1991
EPA-lead remedial investigation/feasibility study (RI/FS) and risk assessment began	April 29, 1992
EPA conducted an ecological risk assessment and human health risk assessment	July 15, 1993
EPA-lead RI/FS concluded and EPA signed a Record of Decision (ROD)	December 23, 1993
EPA began remedial design (RD)	September 22, 1994
EPA-lead RD concluded and Piper began RD for an improved ground water remediation system	December 11, 1995
Piper Aircraft signed a Consent Decree with EPA to implement the selected remedy	July 16, 1996
Piper Aircraft completed RD and began remedial action	September 30, 1997
Piper Aircraft completed installation of in-situ vertical circulation systems (UVB wells)	January 23, 1998
Piper Aircraft completed UVB well development	January 26, 1998
EPA issued the Preliminary Close-Out Report	September 21, 1998
Piper Aircraft concluded remedial action and began developing a Long-Term Response Action	March 3, 2000
EPA signed the first FYR report	May 13, 2004
Piper Aircraft submitted an initial proposal for a Bioremediation Pilot Study	May 27, 2004
Hurricane Frances forced the UVB wells to shut down	September 3, 2004
Hurricane Jeanne forced the UVB wells to shut down	October 29, 2004
Piper Aircraft submitted a revised proposal for a Bioremediation Pilot Study	September 23, 2005
Hurricane Wilma forced the UVB-1A well to shut down	October 2005
Piper Aircraft submitted Bioremediation Pilot Study Phase One Activities Report	May 1, 2008
Piper Aircraft submitted Bioremediation Pilot Study Phase Two Activities Report (Revised)	January 30, 2009
EPA signed the second FYR report	May 5, 2009
EPA issued an Explanation of Significant Differences (ESD) to the 1993 ROD	September 28, 2009

## **3.0 Background**

### **3.1 Physical Characteristics**

The approximately 80-acre Site is located at 2926 Piper Drive, in the City of Vero Beach, Indian River County, Florida, about five miles from the Atlantic Ocean (Figure 1). The Indian River is approximately two miles east of the Site. The property includes several buildings used for manufacturing of general aviation aircraft and aircraft parts, storage, training and administrative purposes (Figure 2).

A trichloroethene (TCE) underground storage tank (UST) located on the Site property since 1975 contaminated site ground water. The UST and surrounding soils were excavated and removed in 1989. The Site spans one property parcel (32393400004000000001.0), but the contaminated ground water plume historically extended beyond this parcel boundary to the southeast. The City of Vero Beach (the City) operates a municipal well field in the area, and the Vero Beach Water Supply Well CVB-15 is located across Aviation Boulevard, 300 feet downgradient from the southern boundary of the Site (Figure 2). The City detected TCE contamination in CVB-15 in October 1978.

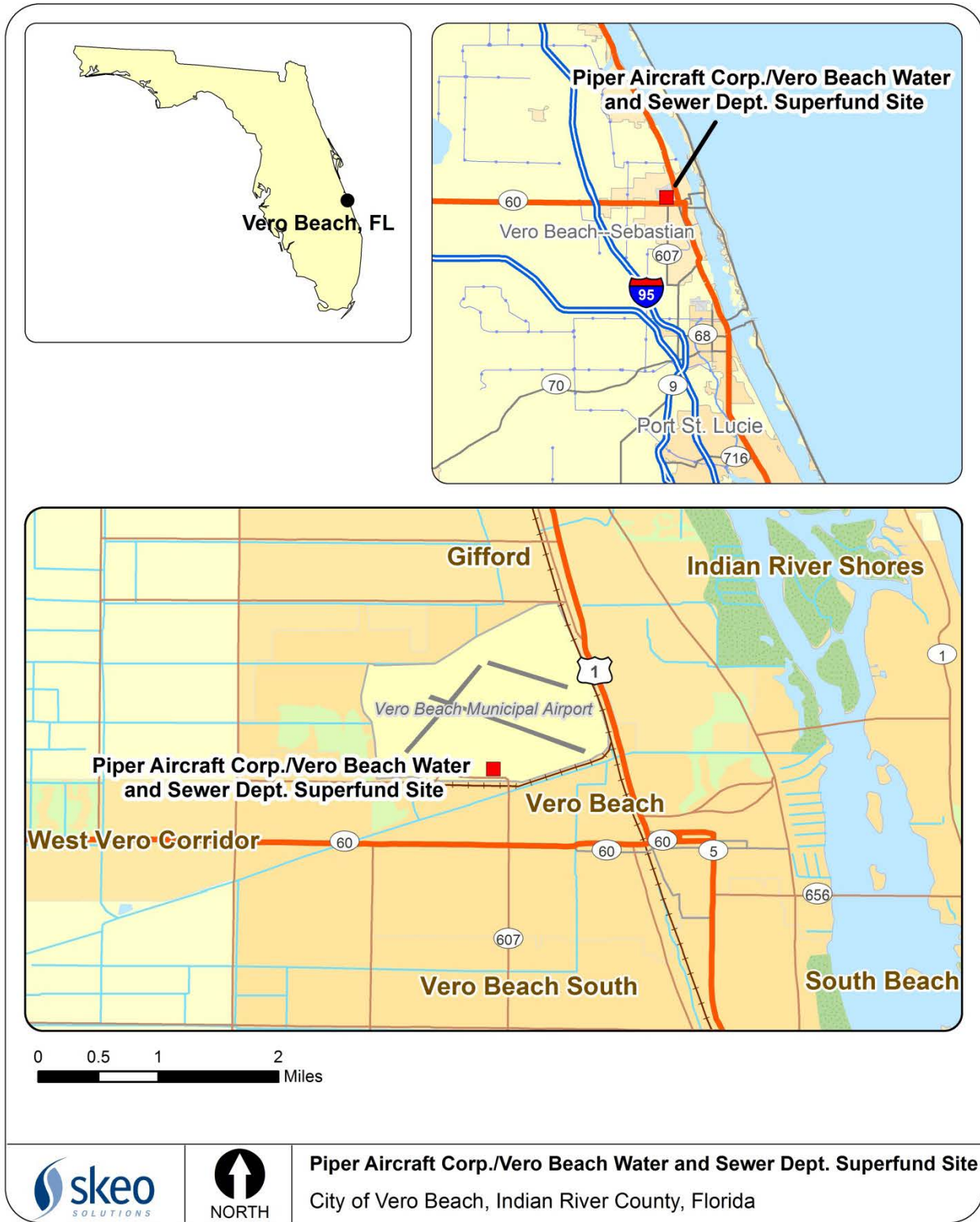
Due to well CVB-15 influence, ground water at the Site flows toward that well. The surficial aquifer beneath the Site exists in a layered sequence of permeable, silty sands and clay aquitards. As a result, the surficial aquifer exists under semi-confined water table to semi-artesian conditions. The surficial aquifer within the vicinity of the Site has an average depth of eight feet below surface and a saturated thickness of approximately 87 feet.

### **3.2 Land and Resource Use**

Several buildings compose the Piper Aircraft, Inc. complex. The company uses these buildings for manufacturing and assembly of general aviation aircraft and aircraft parts, painting, storage, training and administrative purposes. Manufacturing operations at the facility are ongoing. The surrounding areas are zoned for commercial, industrial and residential use, and the land use is not expected to change.

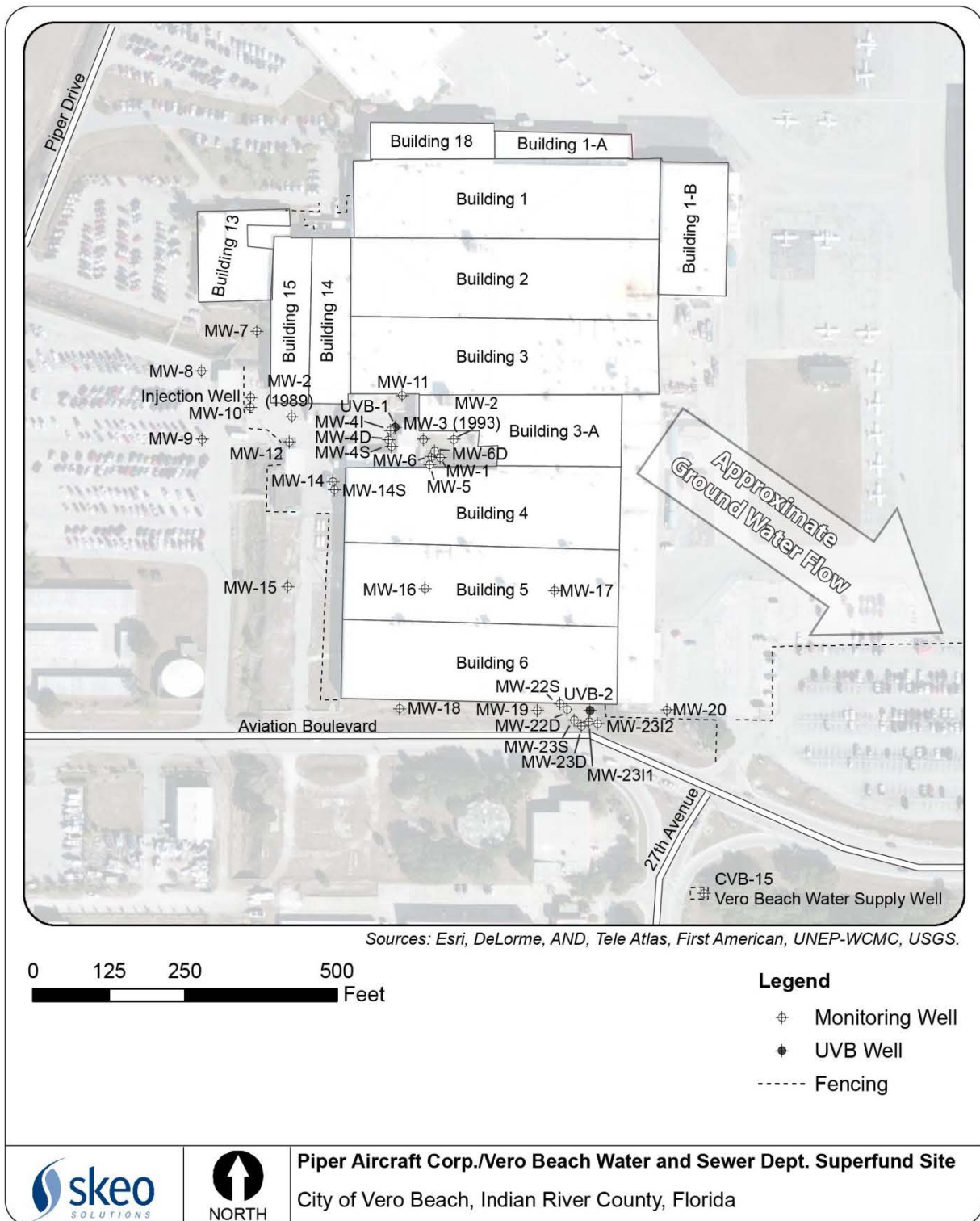
Vero Beach Water & Sewer Department (VBWSD) provides potable water as well as sewage treatment and disposal for residents of Vero Beach. The Site lies on the southeastern section of the municipal well field. Municipal supply well CVB -15 is the closest downgradient municipal well in the plume. The operation of this well is continuous, with the exception of down time for routine maintenance or at the request of Piper Aircraft. The well operation also fluctuates depending on water demands of the City. The City treats all water pumped for potable water sources to acceptable levels before releasing it into the distribution system.

**Figure 1: Site Location Map**



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

**Figure 2: Detailed Site Map**



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

### **3.3 History of Contamination**

In October 1978, VBWSD detected TCE in municipal water well CVB-15, located 1,050 feet southeast and downgradient of Piper Aircraft's 5,000-gallon TCE storage tank. In October 1978, samples of shallow ground water adjacent to the UST revealed a TCE concentration of 39,000 micrograms per liter ( $\mu\text{g/L}$ ). Investigations by the City and Piper Aircraft determined that TCE leaked from a malfunctioning fitting on the UST. Investigations could not determine the duration and rate of leakage.

### **3.4 Initial Response**

Promptly after VBWSD detected TCE in CVB-15 and traced it back to the Piper Aircraft tank, VBWSD discontinued use of well CVB-15 and Piper Aircraft removed the TCE from the UST. Six months later, the City developed two other wells, CVB-19 and CVB-20, to replace non-operational CVB-15. CVB-15 is now used as needed.

In March 1979, VBWSD and Piper Aircraft, with assistance from FDEP, installed a six-inch diameter ground water extraction well adjacent to the tank site for remediation at the source area. The pumping rate was approximately 200 gallons per minute. Extracted water was discharged via a mile-long pipeline to a spray-header assembly installed across a flood control canal. Between April 1981 and February 1992, the extraction well removed approximately 1,162 pounds of contaminants.

In October 1981, Piper Aircraft signed a Consent Agreement with FDEP for continuing the remediation of the TCE contamination levels via ground water extraction. On June 10, 1986, EPA proposed the Site for inclusion on the National Priorities List (NPL), and by March 1988, EPA completed a site inspection.

Piper Aircraft removed the TCE storage tank and excavated soil to a depth of 14 feet below land surface in June 1989. A total of 740 cubic yards of TCE-contaminated soils were landfarmed, an above-ground remediation technology for soils that reduces concentrations of petroleum constituents through biodegradation.

### **3.5 Basis for Taking Action**

EPA finalized the Site on the NPL on February 21, 1990 and conducted a removal assessment in October 1991. EPA began the remedial investigation/feasibility study (RI/FS) on August 3, 1992, and collected 34 ground water samples. Investigations found TCE and its degradation products, cis-1,2-dichloroethene (1,2-DCE), 1,1-dichloroethene and vinyl chloride, in the ground water beneath the Site.

The baseline risk assessment indicated a cumulative potential residential carcinogenic risk level of  $1.1 \times 10^{-3}$ . The two media pathways responsible for this risk level are ground water and air. The ground water risk ( $3.9 \times 10^{-4}$ ) is due to the presence of vinyl chloride.

The air pathway risk ( $6.8 \times 10^{-4}$ ) is due to the presence of 1,1-dichloroethene near the spray treatment nozzle. The exposure to surface water and sediments and the ingestion of fish did not produce unacceptable risk levels.

Several contaminant levels exceeded federal maximum contaminant levels (MCLs) and warranted remediation, including TCE, cis-1,2-dichloroethene, 1,1-dichloroethene, and vinyl chloride.



## 4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e) (9) (iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment.
2. Compliance with ARARs.
3. Long-Term Effectiveness and Permanence.
4. Reduction of Toxicity, Mobility or Volume through Treatment.
5. Short-Term Effectiveness.
6. Implementability.
7. Cost.
8. State Acceptance.
9. Community Acceptance.

### 4.1 Remedy Selection

EPA issued the Record of Decision (ROD) for the Site on December 23, 1993, selecting a remedy for contaminated ground water.

The ROD did not specifically spell out remedial action objectives, but Section 10.1 of the ROD states:

*The ground water treatment component of the selected remedy will protect human health and the environment by reducing or preventing further migration of the contaminated ground water and by reducing the contaminant concentrations in ground water until the concentrations are less than or equal to the performance standards. Compliance with MCLs will be protective at this site. The long-term cancer risk associated with possible ingestion of the ground water will be reduced to within EPA's acceptable risk range of  $1 \times 10^{-4}$  and  $1 \times 10^{-6}$  and the non-carcinogenic risk would be reduced to the EPA goal of 1.*

EPA selected ex-situ treatment of ground water with surface water discharge as the remedy for the Site. The remedy components included:

- Ground water withdrawal using extraction wells.
- Treatment of ground water via air stripping.
- Discharge of treated effluent to surface water.
- If necessary, treatment of air emissions.

Table 2 presents the cleanup goals specified in the 1993 ROD.

**Table 2: Ground Water Contaminant of Concern (COC) Cleanup Goals**

Ground Water COC	ROD Cleanup Goal (µg/L)
TCE	3.0
1,2-DCE	70.0
1,1-dichloroethene	7.0
Vinyl chloride	1.0

EPA issued an Explanation of Significant Differences (ESD) in 2009 to document the approval of an alternate treatment technology and to require institutional controls to restrict ground water use. The alternate treatment technology consists of a proprietary in-well aeration and stripping system, called an Unterdruck-Verdampfer-Brunnen (UVB) vacuum vaporizing well system. The UVB system pumps contaminated water from the ground, treats the water with an air stripper just below the ground surface at the location of the well, and then pumps the treated water back into the ground at that same location.

#### **4.2 Remedy Implementation**

EPA began the remedial design (RD) process on September 22, 1994. Piper Aircraft entered into a consent decree with EPA on November 7, 1995, requiring Piper Aircraft to complete the RD and implement the selected remedy.

The PRP-led RD and focused feasibility study concluded in June 1997, and Piper Aircraft requested that EPA approve the use of the UVB system. EPA agreed to the PRP-proposed alternate technology approach, and Piper incorporated the UVB wells into the RD. The RD phase concluded on September 30, 1997. Piper Aircraft initiated the UVB system in January 1998.

EPA approved another system improvement project engineered in 2001, because well UVB-1 had not recovered significant quantities of contaminated ground water to date. The PRPs constructed well UVB-1A over a monitored “hot spot” of residual contamination near monitoring well 14 (MW-14). A redeveloped well UVB-1 would remove soft iron deposits from the deeper screen section and accept treated effluent originating from well UVB-1A. An aboveground aeration system replaced UVB-2 in November 2001.

With the approval of EPA in 2007, Piper Aircraft has begun investigations to determine if bioremediation would expedite ground water remediation with special regard to treatment of the TCE source area. A proposal to move forward with implementation is currently under review with EPA considering the possibility of adding a second component to address the persistent vinyl chloride contamination.

### 4.3 Operation and Maintenance (O&M)

Two recovery wells, have been in operation since December 1998. Since July 2001, well UVB-1A has replaced UVB-1 as a contaminant recovery well and UVB-1 is used as a return well for treated ground water effluent.

During the past five years, the recovery wells have operated continuously with the exception of brief periods of down time due to system maintenance. During the 3<sup>rd</sup> and 4<sup>th</sup> quarters of 2010, well UVB-1A did not operate due to repairs/replacement of the aerator blower and motor assemblies. Well UVB-1A also did not operate continuously during the 3<sup>rd</sup> quarter 2011 due to system repairs and well redevelopment. Well UVB-2 did not operate during the 2<sup>nd</sup> quarter 2012 due to well redevelopment and pump replacement.

Piper personnel collect influent and effluent samples from the recovery wells on a quarterly basis with the results presented in quarterly UVB systems operation reports. An independent laboratory analyzes samples for volatile organic compounds (VOCs). Piper personnel collect ground water level measurements semi-annually and collect ground water samples from select wells either semi-annually or annually for VOC analysis by an independent laboratory. The quarterly reports present the results of these data.

Piper Aircraft inspects the monitoring wells weekly as part of routine facility maintenance. Staff also replace and repair remedial components on a timely as-needed basis.

The ROD estimated that O&M could cost \$155,125 per year. Actual O&M expenses during the past five years appear in Table 4 below. Because O&M is performed by Piper Aircraft personnel, the costs below are for expenditures only and do not account for electricity expenses or labor. The actual O&M costs are presented in Table 3. For a more detailed breakdown of expenditures, refer to Appendix I.

**Table 3: Annual O&M Costs**

<b>Year</b>	<b>Actual Costs</b>
2009	\$39,000
2010	\$24,000
2011	\$11,000
2012	\$9,000
2013	\$7,000

## 5.0 Progress since the Last Five-Year Review

The protectiveness statement from the 2009 FYR for the Site stated the following:

*The remedy at the Piper Aircraft Vero Beach Site is protective of human health and the environment in the short-term because contaminated ground water is not being used for potable purposes without prior treatment, the treatment system is operating as expected, the newly identified benzene is found along the axis of the plume and can be treated by the remediation system, and Institutional Controls are in place. However, in order for the remedy to be protective in the long-term, the following actions are needed: review historic solvent usage areas to determine if there is another source area, evaluate the vapor intrusion pathway, and modify the ROD to include the requirement of Institutional Controls and document the changes in the treated water discharge. Although the remedy is protective, it may not be the most effective means of attaining cleanup goals and is therefore, being re-evaluated through the implementation of a bioremediation pilot study.*

The 2009 FYR included nine issues and recommendations. This report summarizes each recommendation and its status below.

**Table 4: Progress on Recommendations from the 2009 FYR**

<b>Recommendations</b>	<b>Party Responsible</b>	<b>Milestone Date</b>	<b>Action Taken and Outcome</b>	<b>Date of Action</b>
Continue analyzing ground water samples for benzene	Piper Aircraft	5/1/14	Piper Aircraft has continued monitoring for benzene during the past five years. In summary, based on the lack of recent detections of benzene in ground water at the Site above MCLs, residual soil contamination, if any, does not appear to be acting as a continuing source of benzene contamination in ground water. See section 6.4 for more information.	Ongoing
Use direct-push technology to conduct an investigation to select the best location for an additional monitoring well east of MW-20	Piper Aircraft	5/1/10	As noted by the 1992-1993 remedial investigation documents, remedial workers installed three temporary monitoring wells, TW-04, TW-05 and TW-06, east of the Site during Phase III of the remedial investigations at two depths, 40 feet below land surface and 80 feet below land surface. See Appendix F for related map. These wells did not detect COCs above MCLs.	3/26/2009

<b>Recommendations</b>	<b>Party Responsible</b>	<b>Milestone Date</b>	<b>Action Taken and Outcome</b>	<b>Date of Action</b>
Use direct-push technology (mini drill rig) to conduct additional investigation inside the building(s)	Piper Aircraft	5/1/10	Piper Aircraft considered potential actions, but found that installing a mini drill rig would not be financially or structurally feasible. The FDEP representative noted during the site inspection that a system installation in Building #4 might be helpful and feasible. No installation actions occurred during this FYR period. EPA, FDEP and Piper Aircraft are currently working together to determine the best course of action for conducting additional source investigations.	3/26/2009
Review historic solvent use/storage areas and perform assessment where appropriate	Piper Aircraft	5/1/10	Piper Aircraft performed an in-house search for records and documents regarding historic solvent use, but did not find anything that would warrant additional assessment.	3/26/2009
Conduct vapor intrusion evaluation	Piper Aircraft	5/1/11	Piper Aircraft will conduct a vapor intrusion assessment and is reviewing indoor air-sampling reports to see if historic or recent reports have detected VOCs.	Ongoing
Modify the ROD to require institutional controls in the form of Florida Ground Water Delineation Area	EPA	5/1/10	EPA issued an ESD on September 28, 2009, to require institutional controls in the form of a Florida Ground Water Delineated Area until all COCs meet MCLs.	9/28/2009
Modify the ROD to document the change in the way treated water is discharged	EPA	5/1/10	EPA documented the change in treatment and discharge in an ESD on September 28, 2009.	9/28/2009
Continue implementation of bioremediation pilot study	Piper Aircraft	5/1/14	Piper Aircraft conducted the first two phases of a pilot study to employ bioremediation at the Site. The company's investigations suggested that Piper Aircraft use the maintenance yard as the location for further pilot studies. Piper Aircraft submitted this proposal to EPA in January 2009.	1/30/2009
Reduce sampling frequency from semi-annually to annually for the following wells: MW-2(89), MW4(1), MW-4(D), MW-6(S), MW-6(O), MW-7, MW-10, MW-11, MW-12, MW-14(S), MW-15, MW-18	Piper Aircraft	5/1/10	Piper Aircraft implemented the suggested reduced sampling frequency, but has not updated the O&M plan to reflect these changes.	6/2009

## **6.0 Five-Year Review Process**

### **6.1 Administrative Components**

EPA Region 4 initiated the FYR in October 2013 and scheduled its completion for May 2014. The EPA remedial project manager (RPM) Shelby Johnston led the EPA site review team, which also included the EPA site attorney Elisa Roberts, the EPA community involvement coordinator (CIC) L'Tonya Spencer and contractor support provided to EPA by Skeo Solutions. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

### **6.2 Community Involvement**

In January 2014, EPA published a public notice in the *Vero Beach News Weekly* newspaper announcing the commencement of the FYR process for the Site, providing contact information for Shelby Johnston and L'Tonya Spencer and inviting community participation. The press notice is available in Appendix B. No one contacted EPA as a result of the advertisement.

EPA will make the final FYR Report available to the public. Upon completion of the FYR, EPA will place copies of the document in the designated site information repository: Indian River County Main Library, located at 1600 21st Street, Vero Beach, Florida, 32960.

### **6.3 Document Review**

#### ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain “a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment.” The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate.

- Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically

address a hazardous substance, remedial action, location, or other circumstance found at a CERCLA site.

- Relevant and appropriate requirements are those standards that, while not “applicable,” address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are more stringent than federal requirements may be applicable or relevant and appropriate.
- To-Be-Considered criteria are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary remedial action. For example, To-Be-Considered criteria may be particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish an acceptable amount or concentration of a chemical that may remain in, or discharged to, the ambient environment. Examples of chemical-specific ARARs include MCLs under the federal Safe Drinking Water Act and ambient water quality criteria enumerated under the federal Clean Water Act.

Action-specific ARARs are technology- or activity-based requirements or limits on actions taken with respect to a particular hazardous substance. These requirements are triggered by a particular remedial activity, such as discharge of contaminated ground water or in-situ remediation.

Location-specific ARARs are restrictions on hazardous substances or the conduct of the response activities solely based on their location in a special geographic area. Examples include restrictions on activities in wetlands, sensitive habitats and historic places.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the Five-Year Review for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

#### *Ground Water ARARs*

According to the 1993 ROD, the ground water ARARs are the National Primary Drinking Water Standards and Florida Drinking Water Standards. The Florida Primary Drinking Water Standards are the same as the Federal Primary Drinking Water Standards, except for TCE and vinyl chloride. The Florida standards are more stringent than the federal standards for those two contaminants, and are therefore considered the ARARs. As shown in Table 5, drinking water standards have not changed since the remedy selection.

**Table 5: Previous and Current ARARs for Ground Water COCs**

COCs <sup>a</sup>	1993 ROD MCL <sup>b</sup> (µg/L)	Current (2013) MCL <sup>c</sup> (µg/L)	ARAR Changes
TCE	3.0 <sup>d</sup>	3.0 <sup>d</sup>	None
1,1-dichloroethene	7.0	7.0	None
1,2-DCE	70.0	70.0	None
Vinyl chloride	1.0 <sup>e</sup>	1.0 <sup>e</sup>	None

a. COCs as identified in the site’s 1993 remedial investigation.  
b. The 1993 ROD listed both the current federal and Florida Maximum Contamination Levels (MCLs) as ground water ARARs. The ARAR values listed in this column are the more stringent values of the two MCL values.  
c. This review examined both the current federal and Florida MCLs. The ARAR value listed is the more stringent of the two MCL values. The source for the National Primary and Secondary Drinking Water Maximum Contamination Levels (MCLs) is <http://water.epa.gov/drink/contaminants/index.cfm> (accessed on 12/2/2013). State standards are based on Florida State Primary Drinking Water MCLs: [http://www.dep.state.fl.us/water/drinkingwater/vol\\_con.htm](http://www.dep.state.fl.us/water/drinkingwater/vol_con.htm) (accessed on 12/2/2013).  
d. The less stringent federal MCL for TCE is 5.0 micrograms per liter (µg/L).  
e. The less stringent federal MCL for vinyl chloride is 2.0 micrograms per liter (µg/L).

*Surface Water*

The 2009 ESD modified the ground water remedy to omit the surface water discharge component. Therefore, there are no current surface water ARARs.

*Soil ARARs*

The 1993 ROD did not establish soil ARARs.

Institutional Control Review

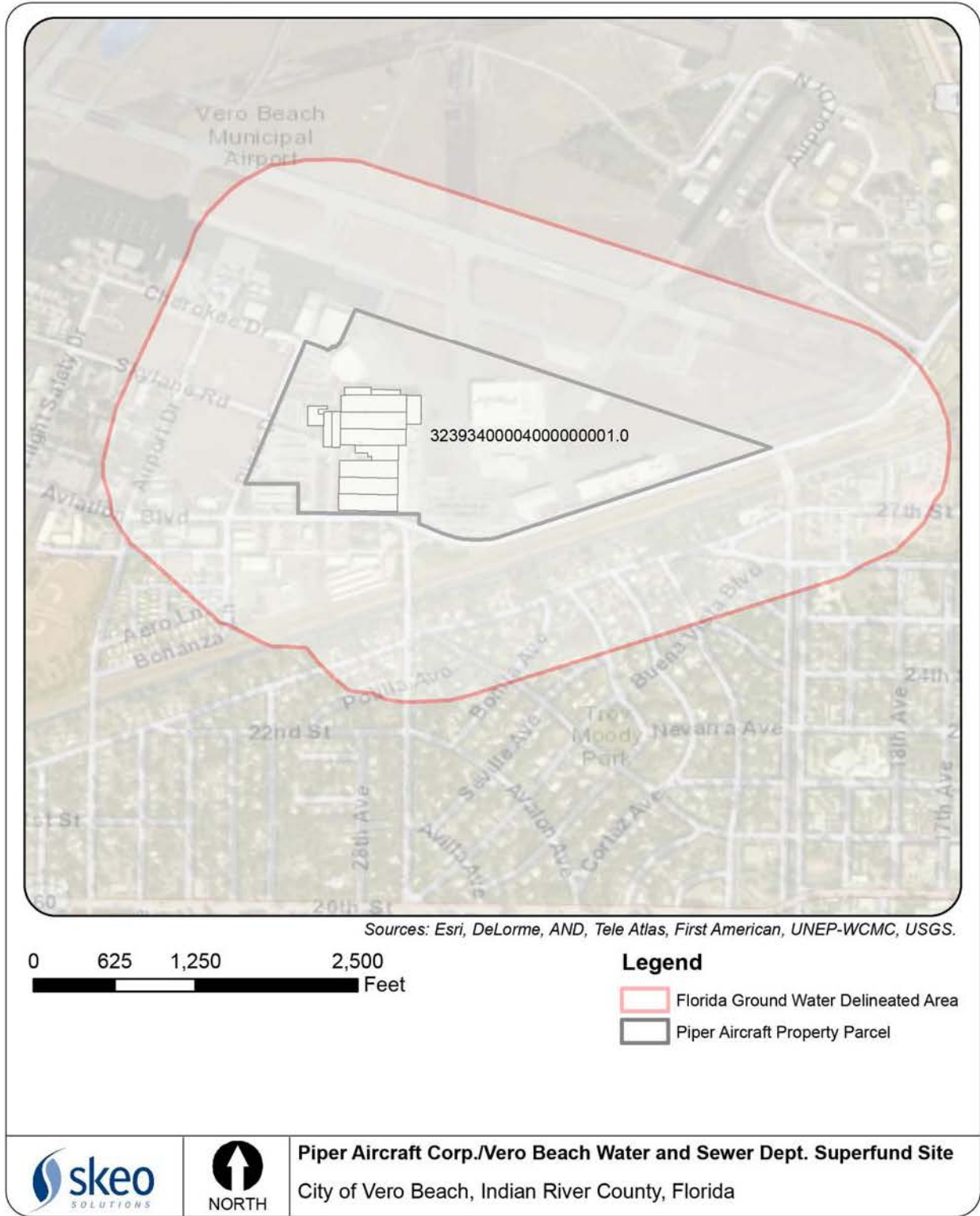
By issuing the ESD in 2009, EPA required institutional controls in the form of the Florida Ground Water Delineated Area designation. FDEP and the water management district monitor well construction and require all users within the area to connect to the city water system for potable water. The ROD stated that in 1989, Piper removed contaminated soil surrounding an UST, with oversight by the Florida Department of Environmental Regulation (now FDEP) According to EPA’s 1992 confirmatory soil sampling, there was no indication of any remaining soil contamination; therefore, land use controls are not necessary. Table 6 lists the institutional controls associated with the Site. Figure 3 shows the relevant Florida Delineated Ground Water Area.



**Table 6: Institutional Control (IC) Summary Table**

Area of Interest – Site-Wide (Parcel: 32393400004000000001.0)					
Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place
Ground Water	Yes	Yes, 2009 ESD document required institutional controls in the form of a ground water delineated area as part of the ground water remedy.	32393400004000000001.0	Restrict installation of ground water wells and ground water use.	The Site and a buffer zone around the perimeter are located within a Florida Delineated Ground Water Area, in which well placement is restricted. <sup>1</sup>
<p>1. Florida's ground water delineation information is available online at:  <a href="http://www.dep.state.fl.us/water/ground_water/delineate.htm">http://www.dep.state.fl.us/water/ground_water/delineate.htm</a>.</p>					

**Figure 3: Florida Ground Water Delineated Area Map**



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

## 6.4 Data Review

### Ground Water

Piper Aircraft personnel collect ground water samples from select wells either semi-annually or annually for VOC analysis. Piper Aircraft personnel also collect samples of influent and effluent from the treatment system on a quarterly basis for VOC analysis.

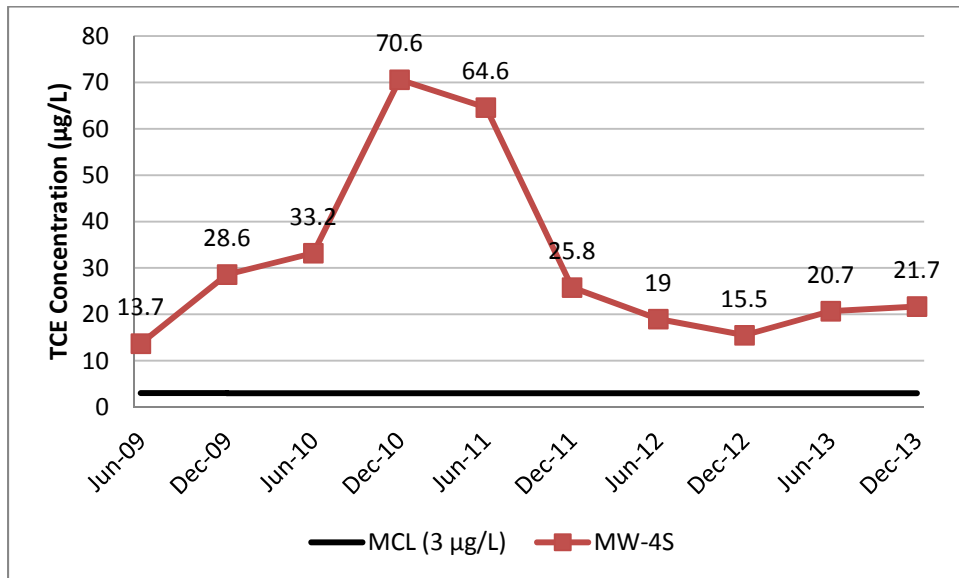
The data review included quarterly reports dated June 2009 through December 2013. During this period, detected concentrations of TCE, 1,2-DCE, vinyl chloride and benzene exceeded current MCLs in one or more samples. Concentrations of 1,1-dichloroethene did not exceed its MCL in any sampling event during the evaluation period.

Appendix G also presents a summary of ground water analytical data for those wells that had at least one COC concentration above the applicable cleanup goal. Appendix H includes a map of well concentrations.

### *TCE*

During the evaluation period, only one monitoring well (MW-4S) contained TCE at or above the cleanup goal of 3 µg/L. TCE concentrations in MW-4S exceeded the cleanup goal in every sampling event during the evaluation period. MW-4S is located in the outer maintenance yard, approximately 250 feet downgradient of the former underground storage tank that historically contained TCE. Figure 4 illustrates the concentrations of TCE in MW-4S.

**Figure 4. TCE Concentrations, Well MW-4S**



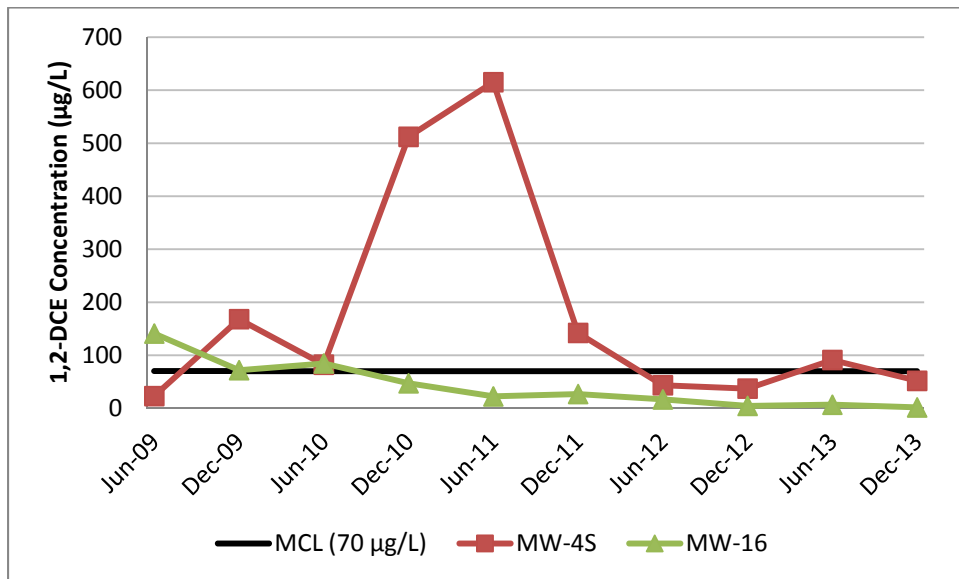
The cause of the increase in TCE concentrations in MW-4S in December 2010 and June 2011 is unknown; however, it does appear to correlate with the lowest recorded ground water levels during the evaluation period. It should also be noted that pumping well

UVB-1, which is located in close proximity to MW-4S, did not operate during the third and fourth quarter of 2010 due to blower unit replacement. MW-4S may have been experiencing rebound conditions during December 2010 and June 2011. TCE was not detected in any of the influent samples (UVB-1A or UVB-2) during the evaluation period.

*1,2-DCE*

During the evaluation period, two monitoring wells (MW-4S and MW-16) had 1,2-DCE concentrations at or above the cleanup goal of 70 µg/L. MW-4S is located in the outer maintenance yard, approximately 250 feet downgradient of the former UST that historically contained TCE. MW-16 is located within Building 5, downgradient of MW-4S. Figure 5 illustrates the concentrations of 1,2-DCE in MW-4S and MW-16 during the evaluation period. Concentrations of 1,2-DCE in MW-4S spiked in 2010 and 2011 and have since declined in the past four sampling events.

**Figure 5. 1,2-DCE Concentrations, Wells MW-4S and MW-16**

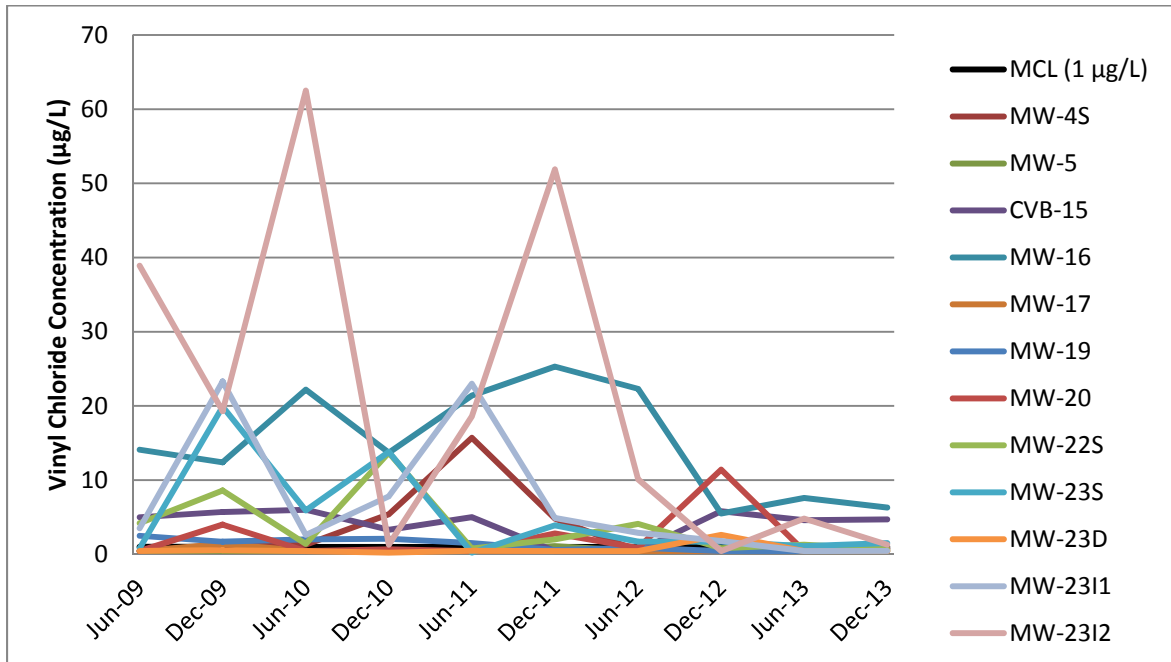


1,2-DCE was detected in both of the influent samples (UVB-1A or UVB-2) during the evaluation period at concentrations below the cleanup goal. The maximum detected influent concentration of 1,2-DCE was 36.3 µg/L in UVB-2 in March 2011.

*Vinyl Chloride*

During the evaluation period, vinyl chloride was detected above the cleanup goal of 1 µg/L in twelve different wells. Figure 6 illustrates the concentrations of vinyl chloride in those wells where concentrations exceeded the cleanup goal at least once during the evaluation period. The maximum detected concentration of vinyl chloride was 62.5 µg/L in MW-23-I2 in June 2010. Vinyl chloride was also detected above the cleanup goal for the first time in deeper well MW-23D at a concentration of 2.6 µg/L during the December 2012 sampling event. In general, vinyl chloride concentrations at the Site have fluctuated over time with no apparent trends.

**Figure 6. Vinyl Chloride Concentrations in Wells with MCL Exceedances**



Vinyl chloride has also been detected above cleanup goals in the influent samples. The maximum detected concentration of vinyl chloride in UVB-1A is 3.7 µg/L (June 2009). Vinyl chloride has not been detected in UVB-1A in recent sampling events (December 2012 and June 2013). The maximum detected concentration of vinyl chloride in UVB-2 is 75.4 µg/L (March 2011). Vinyl chloride was detected at 19.4 µg/L and 14.7 during the two most recent sampling events at UVB-2 (October and December 2013, respectively).

*Benzene*

Although not a COC, samples are tested for benzene. The June 2011 sample from MW-1 exceeded the federal MCL for benzene (5 µg/L). In addition, three samples from MW-1 contained benzene above the state MCL (1 µg/L) in the December 2011, June 2012 and June 2013 sampling event. Benzene was not detected in MW-1 in the December 2013 sampling event.

*City of Vero Beach Municipal Supply Well*

1,2-DCE and vinyl chloride were detected in CVB-15 during the evaluation period; however, only vinyl chloride exceeded its cleanup goal. 1,1-dichloroethene and TCE were not detected in CVB-15 during any of the sampling events conducted during the evaluation period.

The concentrations of COCs in this well have been reduced since the original sampling in 1979. During the current evaluation period, concentrations of 1,2-DCE have fluctuated between non-detect and a maximum detection of 33.1 µg/L in December 2012. Concentrations of vinyl chloride have fluctuated between non-detect and a maximum detection of 6 µg/L in June 2010.

## **6.5 Site Inspection**

The FYR site inspection occurred on January 7, 2014. The attendees were:

- John Sykes III, FDEP, Environmental Specialist III
- John Ten Eyck, VBWSD Assistant Director
- Todd Wegenast, Piper Aircraft, Senior Environmental Health and Safety Manager
- Lars Persson, Piper Aircraft, Professional Geologist
- Ryan Burdge and Sarah Alfano, Skeo Solutions, EPA contractors

Shelby Johnston, EPA RPM, Samantha Urquhart-Foster, EPA RPM, and L'Tonya Spencer, EPA CIC, were unable to attend the site inspection. Piper Aircraft staff members John Bowman and Tony Cotrell attended portions of the site inspection and site tour. The site inspection checklist is included in Appendix D of this FYR report. Photographs from the site inspection are located in Appendix E.

During the initial part of the site inspection, on-site participants and Shelby Johnston (by telephone) met in a conference room to discuss the Site's remedial components and the status of the 2009 FYR recommendations. Then site inspection participants proceeded by foot to tour the manufacturing and storage buildings for the purposes of inspecting the pumping and monitoring wells. All indoor and maintenance yard remedial components appeared secure, in good condition and clearly labeled. Piper Aircraft staff also pointed out various geoprobe locations and components from Phase 1 and Phase 2 of the bioremediation project. FDEP representative John Sykes III noted during the inspection that Building #4 seemed large enough to accommodate equipment needed for subsurface investigations requested in the 2009 FYR. Outdoor monitoring well components appeared secure, in good condition and clearly labeled. City well CVB-15 appeared to be in good condition and Vero Beach representative John Ten Eyck did not voice concerns during the site inspection.

On January 7, 2014, Skeo Solutions staff visited the designated site information repository, Indian River County Main Library, as part of the site inspection. Contractors found site-related documents, including recent FYRs, the ROD and ESD as well as other remedial documents.

## **6.6 Interviews**

The FYR process included interviews with parties affected by the Site, including the current landowners and regulatory agencies involved in Site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. All of the interviews took place over email or phone after the site inspection. The section below summarizes the interview results. Appendix C provides the complete interviews.

Samantha Urquhart-Foster

Ms. Urquhart-Foster, EPA remedial project manager for the Site, believes the pump and treatment system appears to be effective at reducing contaminant concentrations in ground water, with the exception of MW-4S. The surrounding community relies on municipal water and therefore the contaminated ground water is not consumed by nearby residents.

Todd Wegenast

Mr. Todd Wegenast, Piper Aircraft, Inc. Senior Environmental Health and Safety Manager, believes the current remedial system is adequate for the protection of human health and the environment while not posing an undue financial burden on Piper Aircraft. He stated that Piper Aircraft and the City of Vero Beach have worked well together and that there have been no impacts on the surrounding community. He hopes to work with EPA and FDEP to close the project within the next five years.

John Ten Eyck

Mr. John Ten Eyck, VBWSD Assistant Director, has been involved with the cleanup since 1978 and stated he is well informed about the project. He reviews Piper Aircraft's sampling reports on a regular basis and feels confident in the status of the cleanup.

Resident #1

Resident #1 was unaware of the Site and is interested in learning more about the cleanup and current status.

Resident #2

Resident #2 is aware of the Site and is concerned about its impact on the area. He understands the City water serving the community is no contaminated.

## 7.0 Technical Assessment

### 7.1 **Question A: Is the remedy functioning as intended by the decision documents?**

The remedial actions continue to operate and function as designed. Contaminant concentrations have decreased over the years, but using current UVB technology, it may be difficult to bring all contaminant levels below MCLs within a reasonable time frame. Bioremediation is being considered to accelerate the cleanup.

O&M activities have maintained the effectiveness of the remedial actions as expected. Piper Aircraft inspects remedial components on an as-needed or weekly basis and makes repairs and replacements in a prompt manner. Over the past five years, Piper Aircraft has decreased the sampling frequency of several wells that consistently had contaminant levels below the MCL.

In September 2009, EPA issued an ESD to require institutional controls in the form of a Florida Ground Water Delineated Area until all COCs meet MCLs. FDEP and the water management district monitor well construction and require all users within the area to connect to the city water system for potable water. These institutional controls are sufficient and in place to prevent exposure to contaminated ground water.

### 7.2 **Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?**

Ground water cleanup goals are based on ARARs, all of which have remained the same. There have been no changes to exposure assumptions, toxicity data or RAOs that would call into question the ground water cleanup goals. Both on-site and off-site land use has remained the same over the past five years and site stakeholders do not anticipate those land uses to change.

During the last FYR, EPA recommended that Piper Aircraft perform a vapor intrusion evaluation to ensure that vapor intrusion is not an issue for workers within the on-site manufacturing buildings; Piper Aircraft has not yet performed an evaluation. EPA recently issued additional guidance recommending the use of multiple lines of evidence to evaluate the vapor intrusion pathway because this pathway is influenced by many variables, including the geology and hydrogeology of a site, building characteristics and seasonal changes.

For this FYR, the maximum contaminant concentrations detected in December 2013 were entered into the most recent EPA vapor intrusion screening level (VISL) calculator, integrating the most recent toxicity data (Table 7). The VISL calculator provides conservative estimates of risk and noncancer hazards, because the predicted indoor air concentrations are empirically based using conservative “generic” attenuation factors. These factors reflect worst-case conditions and do not take into account any site-specific conditions such as site soil strata, depth to water table, and building properties that may reduce the transport of vapors from ground water through the soil column. The calculator



was run to estimate indoor air risks using a ground water temperature of 25 degrees Celsius for the State of Florida, obtained from EPA’s vapor intrusion guidance.<sup>1</sup> Monitoring data from shallow and intermediate ground water wells located near buildings were used to evaluate on-site worker exposure and hypothetical residential exposure.

The results indicate the December 2013 concentrations do not exceed EPA’s acceptable risk levels for commercial land use. However, inputting the TCE concentrations in MW-4S for December 2009 through December 2011 caused exceedance of the VISL for acceptable noncancer Hazard Index of 1.0 for commercial land use during that time (Appendix G). EPA and the PRPs are still considering additional methods to more precisely determine any vapor intrusion risks posed to workers at the Site. One method currently being considered would include addition of the vinyl chloride and TCE to the analytes routinely monitored as a requirement for the personnel monitoring by the industrial hygiene standards. This type of sampling method would allow the concise analysis of what vapor if any the workers are being exposed to that may be attributed to the plume below the building.

**Table 7: Vapor Intrusion Screening-Level Assessment**

COC	Maximum Ground Water Concentration in December 2013	Ground Water Target Level	Calculated Indoor Air Concentration <sup>a</sup>	Vapor Intrusion Carcinogenic Risk	Vapor Intrusion Hazard
<i>Commercial Scenario</i>					
TCE	21.7 µg/L (MW-4S)	7.4 µg/L	8.33 µg/m <sup>3</sup>	2.9x10 <sup>-6</sup>	0.99
Vinyl chloride	14.7 µg/L (UVB-2)	2.5 µg/L	17.4 µg/m <sup>3</sup>	6.0x10 <sup>-6</sup>	0.38
<i>Residential Scenario*</i>					
TCE	21.7 µg/L (MW-4S)	1.1 µg/L	8.33 µg/m <sup>3</sup>	2.0x10 <sup>-5</sup>	<b>4.2</b>
Vinyl chloride	14.7 µg/L (UVB-2)	0.14 µg/L	17.4 µg/m <sup>3</sup>	<b>1.0x10<sup>-4</sup></b>	0.16
a. EPA Vapor Intrusion Screening Level Calculator, June 2013 <a href="http://www.epa.gov/oswer/vaporintrusion/documents/VISL-Calculator.xlsm">http://www.epa.gov/oswer/vaporintrusion/documents/VISL-Calculator.xlsm</a> b. Bold indicates exceedance of EPA’s acceptable risk. *The Residential scenario was evaluated for the future possible risk to residential inhabitants although the plant is expected to remain industrial for the foreseeable future.					

The ground water monitoring plan does not include analysis for the presence of 1,4-dioxane, a compound that is commonly used in industry as a stabilizer for chlorinated solvents. EPA will determine if additional sampling is necessary to determine if 1,4-dioxane is present at the Site. Due to the institutional controls in place at the Site, the potential presence of 1,4-dioxane is not believed to affect human health and the environment.

<sup>1</sup> User’s Guide for Evaluating Subsurface Vapor Intrusion into Buildings. The EPA’s Office of Emergency and Remedial Response. February 2004 [http://www.epa.gov/oswer/riskassessment/airmodel/pdf/2004\\_0222\\_3phase\\_users\\_guide.pdf](http://www.epa.gov/oswer/riskassessment/airmodel/pdf/2004_0222_3phase_users_guide.pdf).

**7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?**

There do not appear to be any new ecological risks associated with site use or site cleanup. There have not been any impacts from natural disasters noted since the hurricanes in 2003 and 2004.

**7.4 Technical Assessment Summary**

The remedial actions continue to operate and function as designed, though cleanup efforts have not lowered contaminant levels below MCLs. In general, contaminant levels have been going down since remedial actions began, but vinyl chloride levels consistently remain above the MCL at several monitoring wells. Using UVB technology, it may be difficult to bring all contaminant levels below MCLs within a reasonable period. Piper Aircraft has been investigating the use of bioremediation technologies to reduce remaining contaminant levels and will work with EPA and FDEP to implement these technologies. FDEP has also requested a direct-push technology system installation in Building #4 to optimize remedial efforts and ensure that cleanup eliminated all source materials. The Site's institutional controls are sufficient and in place to prevent exposure to contaminated ground water.

During the second FYR, EPA recommended that Piper Aircraft perform a vapor intrusion assessment, but Piper Aircraft has not performed an evaluation to ensure protectiveness. Further assessment may be needed to provide multiple lines of evidence to conclude that vapor intrusion is not posing unacceptable risk to on-site workers.

## 8.0 Issues

Table 8 summarizes the current site issues.

**Table 8: Current Site Issues**

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
The PRPs have not completed a site-specific vapor intrusion assessment.	No	Yes

## 9.0 Recommendations and Follow-up Actions

Table 9 provides recommendations to address the current site issues.

**Table 9: Recommendations to Address Current Site Issues**

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
The PRPs have not completed a site-specific vapor intrusion assessment.	Conduct a site-specific vapor intrusion assessment in accordance with the most recent EPA vapor intrusion guidance.	PRP	EPA	05/12/2015	No	Yes

## **10.0 Protectiveness Statement**

The remedy currently protects human health and the environment, because exposure to contaminated ground water is prevented through the implementation of institutional controls and the first level screening of vapor intrusion indicated that current contaminant levels are within an acceptable risk range. However, in order for the remedy to be protective in the long term, a site-specific vapor intrusion assessment may still be needed to ensure protectiveness since the contaminant concentrations tend to fluctuate.

## **11.0 Next Review**

The next FYR will be due within five years of the signature/approval date of this FYR.

## **Appendix A: List of Documents Reviewed**

Bio-Remediation Pilot Study, Phase Two Activities Report (Revised) for Piper Aircraft NPL Site – Piper Aircraft, Inc. Vero Beach, Florida. January 30, 2009.

Explanation of Significant Difference for Piper Aircraft/Vero Beach Water and Sewer Superfund Site. Vero Beach, Florida. September 28, 2009.

Final Construction Report for New Piper Aircraft, Inc. Superfund Site. Vero Beach, Florida. Prepared for New Piper Aircraft, Inc. December 4, 1998.

First Five-Year Review Report for Piper Aircraft Superfund Site. Vero Beach, Indian River County, Florida. May 13, 2004.

Notice to Property Owners of City of Vero Beach. FDEP. November 18, 2011.

NPL Site Narrative for Piper Aircraft/Vero Beach Water & Sewer.  
<http://www.epa.gov/superfund/sites/npl/nl/n0400512.pdf>. Accessed October 1, 2013.

Piper Aircraft – Vero Beach Water & Sewer, Piper Drive and Aviation Boulevard, HWC #026. Site Summary. FDEP. No Date Available.

Piper Aircraft Corp./Vero Beach Water and Sewer Dept. Region 4 Site Summary Profile.  
<http://www.epa.gov/region4/superfund/sites/npl/florida/piperacfl.html>. Accessed on October 1, 2013.

Proposed Plan Fact Sheet for the Explanation of Significant Differences to the Record of Decision for the Piper Aircraft/Vero Beach Water and Sewer Superfund Site. July 23, 2009.

Record of Decision. Piper Aircraft Corp./Vero Beach Water & Sewer Department. EPA ID: FLD004054284. OU 01. Vero Beach, FL. December 23, 1993.

Second Five-Year Review Report for Piper Aircraft Corp./ Vero Beach Water & Sewer Department Site. EPA ID: FLD004054284. Vero Beach, Indian River County, Florida. May 5, 2009.

Superfund Site Progress Profile for Piper Aircraft Corp./ Vero Beach Water & Sewer Department. <http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0400512>. Accessed October 1, 2013.

U.S. Environmental Protection Agency Remedial Investigation. Piper Aircraft Vero Beach, Florida. 1992/1993.

## O&M Reports

Eleventh Year, Second Quarter and June 2009 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Eleventh Year, Third Quarter and September 2009 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Eleventh Year, Fourth Quarter and December 2009 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Twelfth Year, First Quarter and March 2010 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Twelfth Year, Second Quarter and June 2010 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Twelfth Year, Third Quarter and September 2010 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Twelfth Year, Fourth Quarter and December 2010 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Thirteenth Year, First Quarter and March 2011 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Thirteenth Year, Second Quarter and June 2011 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Thirteenth Year, Third Quarter and September 2011 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Thirteenth Year, Fourth Quarter and December 2012 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Fourteenth Year, First Quarter and March 2012 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Fourteenth Year, Second Quarter and June 2012 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Fourteenth Year, Third Quarter and September 2012 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Fourteenth Year, Fourth Quarter and December 2013 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Fifteenth Year, First Quarter and March 2013 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Fifteenth Year, Second Quarter and June 2013 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Fifteenth Year, Third Quarter and September 2013 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.

Fifteenth Year, Fourth Quarter and December 2013 Operating Report. Piper Aircraft NPL Site- Piper Aircraft, Inc. Vero Beach, Florida.



## Appendix B: Press Notice



### **The U.S. Environmental Protection Agency, Region 4 Announces a Five-Year Review for the Piper Aircraft Corp./Vero Beach Water & Sewer Department Superfund Site, Vero Beach, Indian River County, Florida**

**Purpose/Objective:** EPA is conducting a Five-Year Review of the remedy for the Piper Aircraft Corp./Vero Beach Water & Sewer Department Superfund site (the Site) in Vero Beach, Florida. The purpose of the Five-Year Review is to make sure the selected cleanup actions effectively protect human health and the environment.

**Site Background:** The 80-acre Site is located on Piper Drive next to the Vero Beach municipal airport in east-central Florida. In 1975, Piper Aircraft Corporation began storing trichloroethene (TCE), a volatile organic compound (VOC), in an underground storage tank on site. A leak from the storage tank affected soils and a public well across the street from the Site. The City of Vero Beach discontinued use of the well. In 1989, cleanup crews removed the underground storage tank and dug up contaminated soil. Investigations showed the ground water was still contaminated with TCE and its degradation products. In 1990, EPA listed the Site on the Superfund program's National Priorities List (NPL).

**Cleanup Actions:** EPA selected a remedy to address contaminated ground water in the Site's December 1993 Record of Decision (ROD). It included extraction and treatment of ground water contaminated with VOCs. The selected remedy calls for remediation to continue until monitoring shows aquifer contaminant levels meet cleanup goals and ground water discharge meets surface water standards. EPA updated the remedy in 2009, including institutional controls and use of an in-well aeration/stripping system for more efficient ground water treatment.

**Five-Year Review Schedule:** The National Contingency Plan requires review of remedial actions that result in any hazardous substances, pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The fourth Five-Year Review for the Site will be completed by May 2014.

**EPA Invites Community Participation in the Five-Year Review Process:** EPA is conducting this Five-Year Review to evaluate the effectiveness of the Site's remedy and to ensure that the remedy remains protective of human health and the environment. As part of the Five-Year Review process, EPA staff is available to answer any questions about the Site. Community

members who have questions about the Site or the Five-Year Review process, or who would like to participate in a community interview, are asked to contact:

Samantha Urquhart-Foster, EPA Remedial Project Manager

Community Involvement Coordinator

Phone: (404) 562-8760

(877) 178-3752 (toll-free)

Email: [urquhart-foster.samantha@epa.gov](mailto:urquhart-foster.samantha@epa.gov)

[spencer.latonya@epa.gov](mailto:spencer.latonya@epa.gov)

L'Tonya Spencer, EPA

Phone: (404) 562-8463 |

Email:

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional information is available at the Site's local document repository, located at Indian River County Main Library, 1600 21st Street, Vero Beach, Florida, 32960, and online at:

<http://www.epa.gov/region4/superfund/sites/npl/florida/piperacfl.html>.

## Appendix C: Interview Forms

### Piper Aircraft Corp./Vero Beach Water & Sewer Department Superfund Site Five-Year Review Interview Questions

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Site Name: Piper Aircraft Corp./Vero Beach Water & Sewer Department EPA ID No.: FLD004054284  
Interviewer Name: Sarah Alfano Affiliation: Skeo Solutions  
Subject Name: Samantha Urquhart-Foster Affiliation: EPA Region 4  
Subject Contact Information: 404-562-8760; Urquhart-Foster.Samantha@epa.gov  
Interview Format: Email

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#### Interview Category: Remedial Project Manager (RPM)

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

The operation of the pump and treatment system appears to be effective at reducing contaminant concentrations in ground water. Over the past five years, concentrations of contaminants have generally decreased in all of the wells except for monitoring well MW-4(S). Piper conducts operations, maintenance and sampling activities as scheduled and/or needed. The property is in current use as an airplane manufacturing facility, which provides jobs to local residents.

2. What have been the effects of this Site on the surrounding community, if any?

The property is in current use as an airplane manufacturing facility, which has provided jobs to local residents. The surrounding community relies on municipal water and therefore the contaminated ground water is not consumed by nearby residents. I am not aware of the Site impacting the surrounding community negatively in recent years.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup?

I have not been involved with the Site since the beginning of the cleanup. However, in the past five years, only one individual has expressed concerns about how the Site impacted his former business which was located near the facility at the time the contamination was discovered in the ground water, three decades ago.

4. What is your assessment of the current performance of the remedy in place at the Site?

With the exception of the area of monitoring well MW-4(S), the remedy appears to be effective at decreasing contaminant concentrations throughout the contaminated ground water plume.

5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

Yes

6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details.

No. I am not aware of any community concerns regarding the current operations and management of the remedy. The only community member that has contacted EPA in recent years was discussed in response to question 3.

7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

**Piper Aircraft Corp./Vero Beach Water & Sewer Department Superfund Site**

**Site Name:** Piper Aircraft Corp./Vero Beach Water & Sewer Department      **EPA ID No.:** FLD004054284

**Interviewer Name:** Sarah Alfano

**Affiliation:** Skeo Solutions

**Subject Name:** John Ten Eyck

**Affiliation:** City of Vero Beach

**Subject Contact Information:** JTenEyck@covb.org

**Interview Format:** Email

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**Interview Category: Local Government**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?  
Yes. I have been involved with the site since 1978.
2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?  
Yes. The quarterly and annual reports submitted by Piper Aircraft provide the data necessary to assess the progress of the remediation.
3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?  
N/A
4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?  
No.
5. Are you aware of any changes in projected land use(s) at the Site?  
No.
6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?  
The City of Vero Beach Water & Sewer Department has been kept adequately informed. Reports, such as those currently being provided, and notices received by email are adequate for providing future information. Delivery of reports by electronic means could replace the current system of paper reports, if EPA so desired.
7. Do you have any comments, suggestions or recommendations regarding the project?  
The remediation process has proceeded at a rate that is satisfactory to the City.

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**Site Name:** Piper Aircraft Corp./Vero Beach Water & Sewer Department      **EPA ID No.:** FLD004054284  
**Interviewer Name:** Sarah Alfano      **Affiliation:** Skeo Solutions  
**Subject Name:** Todd Wegenast      **Affiliation:** Piper Aircraft, Inc.  
**Subject Contact Information:** Todd.wegenast@piper.com  
**Interview Format:**      Email

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**Interview Category:**      **Potentially Responsible Parties (PRPs)**

1. What is your overall impression of the remedial activities at the Site?  
I believe the current system is adequate for the protection of human health and the environment, while not posing an undue financial burden on Piper Aircraft. This system has proven to be fairly effective at lowering the contaminant levels and reducing the size of the plume.
  
2. What have been the effects of this Site on the surrounding community, if any?  
There have been no effects to the surrounding community to my knowledge. Piper Aircraft and the City of Vero Beach have worked well together.
  
3. What is your assessment of the current performance of the remedy in place at the Site?  
As stated above. I believe the current remedy in place is effective and with the current institutional controls, a solid plan.
  
4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?  
I am not aware of any complaints or other issues.
  
5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?  
I believe I am well informed and my staff is very knowledgeable of the remediation activities.
  
6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?  
Piper Aircraft will work with the EPA and FDEP to ensure adequate protection of human health and the environment with a goal of closing the project within the next five years.

## Appendix D: Site Inspection Checklist

<b>FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST</b>															
<b>I. SITE INFORMATION</b>															
<b>Site Name: Piper Aircraft Corp./Vero Beach Water &amp; Sewer Department</b>		<b>Date of Inspection: January 7, 2014</b>													
<b>Location and Region: Vero Beach, Florida; Region 4</b>		<b>EPA ID: FLD004054284</b>													
<b>Agency, Office or Company Leading the Five-Year Review: US EPA, Region 4</b>		<b>Weather/Temperature: sunny and chilly</b>													
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Landfill cover/containment</td> <td><input type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input type="checkbox"/> Access controls</td> <td><input type="checkbox"/> Ground water containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input checked="" type="checkbox"/> Ground water pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Other: _____</td> <td></td> </tr> </table>				<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> Access controls	<input type="checkbox"/> Ground water containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input checked="" type="checkbox"/> Ground water pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input type="checkbox"/> Other: _____	
<input type="checkbox"/> Landfill cover/containment	<input type="checkbox"/> Monitored natural attenuation														
<input type="checkbox"/> Access controls	<input type="checkbox"/> Ground water containment														
<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls														
<input checked="" type="checkbox"/> Ground water pump and treatment															
<input type="checkbox"/> Surface water collection and treatment															
<input type="checkbox"/> Other: _____															
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached (see Section 6.5) <input checked="" type="checkbox"/> Site map attached (see Figure 2)															
<b>II. INTERVIEWS</b> (check all that apply)															
1. <b>O&amp;M Site Manager</b>	<u>Todd Wegenast</u> Name	<u>Senior Environmental Health and Safety Manager</u> Title	<u>01/10/2014</u> Date												
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by email Problems, suggestions <input type="checkbox"/> Report attached: <u>See Appendix C.</u>															
2. <b>O&amp;M Staff</b>	_____ Name	_____ Title	_____/_____/_____ Date												
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone: _____ Problems/suggestions <input type="checkbox"/> Report attached: _____															
3.	<b>Local Regulatory Authorities and Response Agencies</b> (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.														
	Agency <u>FDEP</u>														
	Contact <u>John Sykes III</u> Name	<u>Environmental Specialist III Hazardous Waste Cleanup Section</u> Title	_____ Date												
			<u>(850) 245-8960</u> Phone No.												
	Problems/suggestions <input type="checkbox"/> Report attached: <u>See Appendix C.</u>														
	Agency <u>City of Vero Beach Water &amp; Sewer Department</u>														
	Contact <u>John Ten Eyck</u> Name	<u>Assistant Director</u> Title	_____ Date												
			<u>(772) 978-5205</u> Phone No.												
	Problems/suggestions <input type="checkbox"/> Report attached: <u>See Appendix C.</u>														
4.	<b>Other Interviews</b> (optional) <input type="checkbox"/> Report attached: _____														

<b>III. ON-SITE DOCUMENTS AND RECORDS VERIFIED</b> (check all that apply)					
1.	<b>O&amp;M Documents</b>	<input type="checkbox"/> O&M manual	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
		<input checked="" type="checkbox"/> As-built drawings	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
		<input type="checkbox"/> Maintenance logs	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: <u>Piper Aircraft staff replace and repair remedial components as needed in a timely manner.</u>					
2.	<b>Site-Specific Health and Safety Plan</b>		<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
		<input checked="" type="checkbox"/> Contingency plan/emergency response plan	<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: <u>Piper Aircraft has a detailed safety plan for the facility, but due to the low risk associated with the current remedial actions, there is no separate portion for precautions dealing with remedial components.</u>					
3.	<b>O&amp;M and OSHA Training Records</b>		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
4.	<b>Permits and Service Agreements</b>				
		<input checked="" type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
		<input checked="" type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
		<input checked="" type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
		<input type="checkbox"/> Other permits: _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____					
5.	<b>Gas Generation Records</b>		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
6.	<b>Settlement Monument Records</b>		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
7.	<b>Ground Water Monitoring Records</b>		<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____					
8.	<b>Leachate Extraction Records</b>		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
Remarks: _____					
9.	<b>Discharge Compliance Records</b>				
		<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
		<input checked="" type="checkbox"/> Water (effluent)	<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: _____					
10.	<b>Daily Access/Security Logs</b>		<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
Remarks: <u>Piper Aircraft has a security checkpoint when entering the visitor's building. Other entrances are gated and secure.</u>					
<b>IV. O&amp;M COSTS</b>					



1.	<b>O&amp;M Organization</b>	<input type="checkbox"/> State in-house	<input type="checkbox"/> Contractor for state
		<input checked="" type="checkbox"/> PRP in-house	<input type="checkbox"/> Contractor for PRP
		<input type="checkbox"/> Federal facility in-house	<input type="checkbox"/> Contractor for Federal facility
		<input type="checkbox"/> _____	
2.	<b>O&amp;M Cost Records</b>	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date
		<input type="checkbox"/> Funding mechanism/agreement in place	<input type="checkbox"/> Unavailable
		Original O&M cost estimate: _____ <input type="checkbox"/> Breakdown attached	
		Total annual cost by year for review period if available	
	From: <u>mm/dd/yyyy</u>	To: <u>mm/dd/yyyy</u>	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
	From: <u>mm/dd/yyyy</u>	To: <u>mm/dd/yyyy</u>	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
	From: <u>mm/dd/yyyy</u>	To: <u>mm/dd/yyyy</u>	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
	From: <u>mm/dd/yyyy</u>	To: <u>mm/dd/yyyy</u>	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
	From: <u>mm/dd/yyyy</u>	To: <u>mm/dd/yyyy</u>	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
3.	<b>Unanticipated or Unusually High O&amp;M Costs during Review Period</b>		
	Describe costs and reasons: _____		
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<b>A. Fencing</b>			
1.	<b>Fencing Damaged</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Gates secured <input type="checkbox"/> N/A
	Remarks: _____		
<b>B. Other Access Restrictions</b>			
1.	<b>Signs and Other Security Measures</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	Remarks: <u>Piper Aircraft has a security fence around the facility and requires checking in when entering the visitor's building. Other entrances are gated and secure.</u>		
<b>C. Institutional Controls (ICs)</b>			

<b>1. Implementation and Enforcement</b>			
Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Type of monitoring (e.g., self-reporting, drive by): <u>Remedial components are checked at least weekly by Piper Aircraft staff. The Site is located within a Florida Ground Water Delineated Area so strict and sufficient well-construction standards through permitting requirements apply to the area.</u>			
Frequency: _____			
Responsible party/agency: <u>Piper Aircraft, Inc.</u>			
Contact	<u>Todd Wegenast</u>	<u>Senior Environmental Health and Safety Manager</u>	<u>01/07/2014 (772) 299-2476</u>
Name	Title	Date	Phone no.
Reporting is up to date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Violations have been reported	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Other problems or suggestions: <input type="checkbox"/> Report attached			
<b>2. Adequacy</b> <input checked="" type="checkbox"/> ICs are adequate <input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A			
Remarks: <u>A 2009 ESD calls for institutional controls and the Site is in a Florida Ground Water Delineated Area.</u>			
<b>D. General</b>			
<b>1. Vandalism/Trespassing</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No vandalism evident			
Remarks: _____			
<b>2. Land Use Changes On Site</b> <input checked="" type="checkbox"/> N/A			
Remarks: _____			
<b>3. Land Use Changes Off Site</b> <input checked="" type="checkbox"/> N/A			
Remarks: _____			
<b>VI. GENERAL SITE CONDITIONS</b>			
<b>A. Roads</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<b>1. Roads Damaged</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A			
Remarks: _____			
<b>B. Other Site Conditions</b>			
Remarks: _____			
<b>VII. LANDFILL COVERS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			

1.	<b>Settlement</b> (low spots)	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
2.	<b>Cracks</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: _____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	<b>Holes</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Holes not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	<b>Vegetative Cover</b>	<input type="checkbox"/> Grass	<input type="checkbox"/> Cover properly established
	<input type="checkbox"/> No signs of stress	<input type="checkbox"/> Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	<b>Alternative Cover</b> (e.g., armored rock, concrete)		<input type="checkbox"/> N/A
	Remarks: _____		
7.	<b>Bulges</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	<b>Wet Areas/Water Damage</b>	<input type="checkbox"/> Wet areas/water damage not evident	
	<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Arial extent: _____
	<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Arial extent: _____
	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Arial extent: _____
	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Arial extent: _____
	Remarks: _____		
9.	<b>Slope Instability</b>	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map
	<input type="checkbox"/> No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
<b>B. Benches</b>			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
	Remarks: _____		

2.	<b>Bench Breached</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
Remarks: _____			
3.	<b>Bench Overtopped</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
Remarks: _____			
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b> (Low spots)	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of settlement
Aerial extent: _____		Depth: _____	
Remarks: _____			
2.	<b>Material Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of degradation
Material type: _____		Aerial extent: _____	
Remarks: _____			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion
Aerial extent: _____		Depth: _____	
Remarks: _____			
4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
Aerial extent: _____		Depth: _____	
Remarks: _____			
5.	<b>Obstructions</b>	Type: _____	<input type="checkbox"/> No obstructions
<input type="checkbox"/> Location shown on site map		Aerial extent: _____	
Size: _____			
Remarks: _____			
6.	<b>Excessive Vegetative Growth</b>	Type: _____	
<input type="checkbox"/> No evidence of excessive growth			
<input type="checkbox"/> Vegetation in channels does not obstruct flow			
<input type="checkbox"/> Location shown on site map		Aerial extent: _____	
Remarks: _____			
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active	<input type="checkbox"/> Passive
<input type="checkbox"/> Properly secured/Locked		<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
Remarks: _____			

2.	<b>Gas Monitoring Probes</b>	<input type="checkbox"/> Properly secured/Locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
		Remarks: _____			
3.	<b>Monitoring Wells</b> (within surface area of landfill)	<input type="checkbox"/> Properly secured/Locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
		Remarks: _____			
4.	<b>Extraction Wells Leachate</b>	<input type="checkbox"/> Properly secured/Locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
		<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
		Remarks: _____			
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed	<input type="checkbox"/> N/A	
		Remarks: _____			
<b>E. Gas Collection and Treatment</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A		
1.	<b>Gas Treatment Facilities</b>	<input type="checkbox"/> Flaring	<input type="checkbox"/> Thermal destruction	<input type="checkbox"/> Collection for reuse	
		<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs maintenance		
		Remarks: _____			
2.	<b>Gas Collection Wells, Manifolds and Piping</b>	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs maintenance		
		Remarks: _____			
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings)	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A	
		Remarks: _____			
<b>F. Cover Drainage Layer</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A		
1.	<b>Outlet Pipes Inspected</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A		
		Remarks: _____			
2.	<b>Outlet Rock Inspected</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A		
		Remarks: _____			
<b>G. Detention/Sedimentation Ponds</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A		

1.	<b>Siltation</b>	Area extent: _____	Depth: _____	<input type="checkbox"/> N/A
	<input type="checkbox"/> Siltation not evident			
	Remarks: _____			
2.	<b>Erosion</b>	Area extent: _____	Depth: _____	
	<input type="checkbox"/> Erosion not evident			
	Remarks: _____			
3.	<b>Outlet Works</b>	<input type="checkbox"/> Functioning		<input type="checkbox"/> N/A
	Remarks: _____			
4.	<b>Dam</b>	<input type="checkbox"/> Functioning		<input type="checkbox"/> N/A
	Remarks: _____			
<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident	
	Horizontal displacement: _____		Vertical displacement: _____	
	Rotational displacement: _____			
	Remarks: _____			
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident	
	Remarks: _____			
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident	
	Area extent: _____		Depth: _____	
	Remarks: _____			
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A	
	<input type="checkbox"/> Vegetation does not impede flow			
	Area extent: _____		Type: _____	
	Remarks: _____			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident	
	Area extent: _____		Depth: _____	
	Remarks: _____			
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks: _____			
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident	
	Area extent: _____		Depth: _____	
	Remarks: _____			

2.	<b>Performance Monitoring</b>	Type of monitoring: _____
	<input type="checkbox"/> Performance not monitored	
	Frequency: _____	<input type="checkbox"/> Evidence of breaching
	Head differential: _____	
	Remarks: _____	
<b>IX. GROUND WATER/SURFACE WATER REMEDIES</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
<b>A. Ground Water Extraction Wells, Pumps and Pipelines</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Pumps, Wellhead Plumbing and Electrical</b>	
	<input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> All required wells properly operating	<input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A
	Remarks: _____	
2.	<b>Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances</b>	
	<input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance	
	Remarks: _____	
3.	<b>Spare Parts and Equipment</b>	
	<input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade	<input type="checkbox"/> Needs to be provided
	Remarks: <u>Piper Aircraft performs all remedial component repair and replacement as needed.</u>	
<b>B. Surface Water Collection Structures, Pumps and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	<b>Collection Structures, Pumps and Electrical</b>	
	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance	
	Remarks: _____	
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances</b>	
	<input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance	
	Remarks: _____	
3.	<b>Spare Parts and Equipment</b>	
	<input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade	<input type="checkbox"/> Needs to be provided
	Remarks: _____	
<b>C. Treatment System</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		

<p>1. <b>Treatment Train</b> (check components that apply)</p> <p><input type="checkbox"/> Metals removal                      <input type="checkbox"/> Oil/water separation                      <input checked="" type="checkbox"/> Bioremediation</p> <p><input type="checkbox"/> Air stripping                              <input type="checkbox"/> Carbon adsorbers</p> <p><input type="checkbox"/> Filters: _____</p> <p><input type="checkbox"/> Additive (e.g., chelation agent, flocculent): _____</p> <p><input checked="" type="checkbox"/> Others: _____</p> <p><input checked="" type="checkbox"/> Good condition                      <input type="checkbox"/> Needs maintenance</p> <p><input checked="" type="checkbox"/> Sampling ports properly marked and functional</p> <p><input type="checkbox"/> Sampling/maintenance log displayed and up to date</p> <p><input checked="" type="checkbox"/> Equipment properly identified</p> <p><input checked="" type="checkbox"/> Quantity of ground water treated annually: <u>Average of 2,649,937 gallons per year (18 quarters considered for UVB-1 and UVB-2).</u></p> <p><input type="checkbox"/> Quantity of surface water treated annually: _____</p> <p>Remarks: _____</p>
<p>2. <b>Electrical Enclosures and Panels</b> (properly rated and functional)</p> <p><input type="checkbox"/> N/A                      <input checked="" type="checkbox"/> Good condition                      <input type="checkbox"/> Needs maintenance</p> <p>Remarks: _____</p>
<p>3. <b>Tanks, Vaults, Storage Vessels</b></p> <p><input type="checkbox"/> N/A                      <input checked="" type="checkbox"/> Good condition                      <input type="checkbox"/> Proper secondary containment                      <input type="checkbox"/> Needs maintenance</p> <p>Remarks: _____</p>
<p>4. <b>Discharge Structure and Appurtenances</b></p> <p><input type="checkbox"/> N/A                      <input checked="" type="checkbox"/> Good condition                      <input type="checkbox"/> Needs maintenance</p> <p>Remarks: _____</p>
<p>5. <b>Treatment Building(s)</b></p> <p><input checked="" type="checkbox"/> N/A                      <input type="checkbox"/> Good condition (esp. roof and doorways)                      <input type="checkbox"/> Needs repair</p> <p><input type="checkbox"/> Chemicals and equipment properly stored</p> <p>Remarks: _____</p>
<p>6. <b>Monitoring Wells</b> (pump and treatment remedy)</p> <p><input checked="" type="checkbox"/> Properly secured/Locked                      <input checked="" type="checkbox"/> Functioning                      <input checked="" type="checkbox"/> Routinely sampled                      <input type="checkbox"/> Good condition</p> <p><input checked="" type="checkbox"/> All required wells located                      <input type="checkbox"/> Needs maintenance                      <input type="checkbox"/> N/A</p> <p>Remarks: _____</p>
<p><b>D. Monitoring Data</b></p>
<p>1. <b>Monitoring Data</b></p> <p><input checked="" type="checkbox"/> Is routinely submitted on time                      <input checked="" type="checkbox"/> Is of acceptable quality</p>



2. <b>Monitoring Data Suggests:</b> <input checked="" type="checkbox"/> Ground water plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining
<b>E. Monitored Natural Attenuation</b>
1. <b>Monitoring Wells</b> (natural attenuation remedy) <input type="checkbox"/> Properly secured/Locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs maintenance <input checked="" type="checkbox"/> N/A Remarks: _____
<b>X. OTHER REMEDIES</b>
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.
<b>XI. OVERALL OBSERVATIONS</b>
<b>A. Implementation of the Remedy</b> Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). <u>The remedy is functioning and contaminant concentrations have declined. It is uncertain whether the treatment system will achieve remediation goals, so Piper Aircraft has been exploring bioremediation. Piper Aircraft submitted a plan to EPA to begin bioremediation and is waiting for a response.</u>
<b>B. Adequacy of O&amp;M</b> Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>O&amp;M activities are adequate. Piper Aircraft makes repairs and replacements in a timely and responsible manner. The sampling for the UVB wells and other monitoring wells is sufficient. If Piper Aircraft begins bioremediation, additional O&amp;M activities will be required.</u>
<b>C. Early Indicators of Potential Remedy Problems</b> Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <u>None noted.</u>
<b>D. Opportunities for Optimization</b> Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>None noted.</u>

## Appendix E: Photographs from Site Inspection Visit



UVB-2 and sump pump to monitoring well outside of Piper Aircraft facility



Former location of TCE storage tank, current injection point for UVB-2



The inner maintenance area, home to several remedial components and surrounded by manufacturing buildings





MW-2 within the inner maintenance area



Looking across Aviation Boulevard, viewing Piper looking northwest from CVB-15





Indoor MW-16



Indoor MW-17





Outdoor well cluster near Aviation Boulevard



Shops across Aviation Boulevard from Piper Aircraft facilities

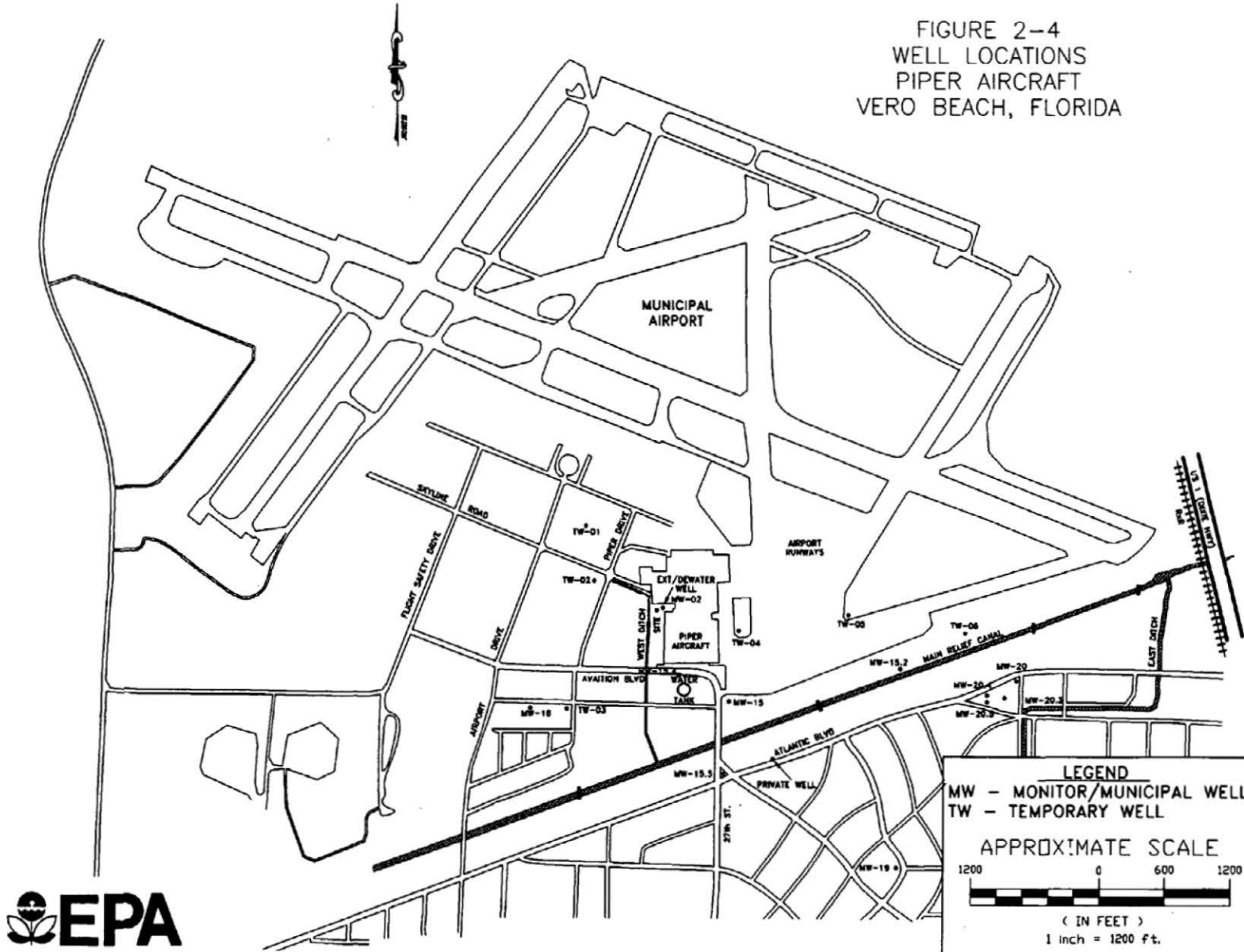


Outdoor UVB-1A



Appendix F: Map from Remedial Investigation

FIGURE 2-4  
WELL LOCATIONS  
PIPER AIRCRAFT  
VERO BEACH, FLORIDA





## Appendix G: Analytical Data for Ground Water

Ground Water Analytical Results for Wells Reporting at Least One MCL Exceedance  
June 2009 through December 2013

	Jun-09				Dec-09			
	1,1-DCE	cis-1,2-DCE	TCE	VC	1,1-DCE	cis-1,2-DCE	TCE	VC
<b>MCL</b>	7	70	3	1	7	70	3	1
MW-4S	<0.54	23	<b>13.7</b>	0.45	<1.1	<b>168</b>	<b>28.6</b>	<b>1.3</b>
MW-5	<0.54	1.7	2.8	<0.3	<0.54	0.59	1.9	<0.3
MW-16	1.8	<b>141</b>	<0.64	<b>14.1</b>	1.7	<b>71.8</b>	0.44	<b>12.4</b>
MW-17	<0.54	2.7	0.33	<0.3	<0.54	11.1	0.36	<b>1.4</b>
MW-18	<0.54	2	<0.32	<0.3	NS	NS	NS	NS
MW-19	<0.54	2.1	<0.32	<b>2.5</b>	<0.54	1.3	<0.32	<b>1.7</b>
MW-20	<0.54	0.25	<0.32	<0.3	<0.54	3.4	<0.32	<b>4</b>
MW-22S	<0.54	1.6	<0.32	<b>4.2</b>	<0.54	2.3	<0.32	<b>8.6</b>
MW-23S	<0.54	1	<0.32	0.81	<0.54	6.8	<0.32	<b>19.9</b>
MW-23D	<0.54	1.7	<0.32	<0.3	<0.54	2.3	<0.32	0.54
MW-23I1	<0.54	4.5	<0.32	<b>3.5</b>	<0.54	6.6	<0.32	<b>23.3</b>
MW-23I2	<0.54	4.5	<0.32	<b>38.9</b>	<0.54	3.1	<0.32	<b>19.3</b>
CVB-15	<0.54	25.7	<0.32	<b>5</b>	<0.54	21.3	<0.32	<b>5.7</b>
UVB-1A (I)	<0.54	12.6	<0.32	<b>3.7</b>	NS	NS	NS	NS
UVB-2 (I)	<0.54	15.9	<0.32	<b>49.7</b>	<0.54	14.8	<0.32	<b>42.9</b>

**Notes**

< indicates not detected at stated detection limit

NS - Not Sampled

MCL - Maximum Contaminant Level; Lower of the Federal or State MCL

Bold text/gray shading indicates the detected concentration meets or exceeds MCL

All concentrations reported in micrograms per liter (ug/L)

Ground Water Analytical Results for Wells Reporting at Least One MCL Exceedance

June 2009 through December 2013

	Jun-10				Dec-10			
	1,1-DCE	cis-1,2-DCE	TCE	VC	1,1-DCE	cis-1,2-DCE	TCE	VC
MCL	7	70	3	1	7	70	3	1
MW-4S	0.51	<b>82.2</b>	<b>33.2</b>	<b>1.3</b>	0.99	<b>512</b>	<b>70.6</b>	<b>5.4</b>
MW-5	<0.29	0.35	1.4	<0.28	<0.23	8.1	1.3	<0.22
MW-16	1.6	<b>84.5</b>	0.35	<b>22.2</b>	1.4	47.1	0.31	<b>13.7</b>
MW-17	<0.29	2.9	<0.24	<0.28	<0.23	1.4	<0.26	<0.22
MW-18	<0.29	0.6	<0.24	<0.28	NS	NS	NS	NS
MW-19	<0.29	2.5	<0.24	<b>2</b>	<0.23	1.8	<0.26	<b>2.1</b>
MW-20	<0.29	<0.32	<0.24	<0.28	<0.23	0.5	<0.26	0.67
MW-22S	<0.29	2.8	<0.24	<b>1.4</b>	<0.23	5	<0.26	<b>13.7</b>
MW-23S	<0.29	2.4	<0.24	<b>5.9</b>	<0.23	5.4	<0.26	<b>13.8</b>
MW-23D	<0.29	1.8	<0.24	<0.28	<0.23	1.2	<0.26	<0.22
MW-23I1	<0.29	1.4	<0.24	<b>2.6</b>	<0.23	3	<0.26	<b>7.8</b>
MW-23I2	<0.29	10.6	0.26	<b>62.5</b>	<0.23	0.29	<0.26	<b>1.3</b>
CVB-15	<0.29	22.1	<0.24	<b>6</b>	<0.23	16.9	<0.26	<b>3.3</b>
UVB-1A (I)	<0.29	1	<0.24	0.38	NS	NS	NS	NS
UVB-2 (I)	NS	NS	NS	NS	<0.23	14.8	<0.26	<b>35.2</b>

Notes

< indicates not detected

NS - Not Sampled

MCL - Maximum Contaminant Level

Bold text/gray shading indicates MCL exceedance

All concentrations reported in mg/L

Ground Water Analytical Results for Wells Reporting at Least One MCL Exceedance  
June 2009 through December 2013

	Jun-11				Dec-11			
	1,1-DCE	cis-1,2-DCE	TCE	VC	1,1-DCE	cis-1,2-DCE	TCE	VC
<b>MCL</b>	7	70	3	1	7	70	3	1
MW-4S	<2.3	<b>615</b>	<b>64.6</b>	<b>15.7</b>	0.55	<b>142</b>	<b>25.8</b>	<b>4.8</b>
MW-5	<0.23	17.5	1.1	<0.22	<0.23	3.7	1.3	<b>1.1</b>
MW-16	0.32	22.4	<0.26	<b>21.4</b>	0.63	26.7	0.28	<b>25.3</b>
MW-17	<0.23	2	<0.26	<0.22	<0.23	2.3	<0.26	<0.22
MW-18	<0.23	<0.26	<0.26	<0.22	NS	NS	NS	NS
MW-19	<0.23	3.1	<0.26	<b>1.5</b>	<0.23	3.2	<0.26	0.58
MW-20	<0.23	<0.26	<0.26	<0.22	<0.23	1.6	<0.26	<b>2.8</b>
MW-22S	<0.23	3.1	<0.26	0.78	<0.23	0.96	<0.26	<b>2</b>
MW-23S	<0.23	7.9	<0.26	<0.22	<0.23	4.2	<0.26	<b>3.9</b>
MW-23D	<0.23	1.8	<0.26	0.47	<0.23	1.3	<0.26	<0.22
MW-23I1	<0.23	8.9	<0.26	<b>23</b>	<0.23	5.2	<0.26	<b>4.9</b>
MW-23I2	<0.23	4.8	<0.26	<b>18.6</b>	0.34	20.4	<0.26	<b>51.9</b>
CVB-15	<0.23	14.5	<0.26	<b>5</b>	<0.23	<0.26	<0.26	<0.22
UVB-1A (I)	<0.23	3.4	<0.26	<b>1.9</b>	<0.23	1.2	<0.26	0.51
UVB-2 (I)	<0.23	20.3	<0.26	<b>52.2</b>	<0.23	2.8	<0.26	<b>6</b>

**Notes**

- < indicates not detected
- NS - Not Sampled
- MCL - Maximum Contaminant Level
- Bold text/gray shading indicates MCL exceedance
- All concentrations reported in mg/L

## Ground Water Analytical Results for Wells Reporting at Least One MCL Exceedance

June 2009 through December 2013

	Jun-12				Dec-12			
	1,1-DCE	cis-1,2-DCE	TCE	VC	1,1-DCE	cis-1,2-DCE	TCE	VC
<b>MCL</b>	7	70	3	1	7	70	3	1
MW-4S	<0.23	43.3	<b>19</b>	0.45	<0.2	37	<b>15.5</b>	<0.44
MW-5	<0.23	4.4	1.8	<0.22	<0.2	2	1.4	<0.44
MW-16	<0.23	16.7	<0.26	<b>22.3</b>	<0.2	4.4	<0.31	<b>5.5</b>
MW-17	<0.23	3.1	0.31	<0.22	<0.2	1.6	<0.31	<0.44
MW-18	<0.23	1.7	<0.26	<0.22	NS	NS	NS	NS
MW-19	<0.23	2.5	<0.26	0.88	<0.2	0.73	<0.31	<0.44
MW-20	<0.23	1	<0.26	0.87	<0.2	8.1	<0.31	<b>11.4</b>
MW-22S	<0.23	2	<0.26	<b>4.1</b>	<0.2	1.8	<0.31	0.82
MW-23S	<0.23	2	<0.26	<b>1.7</b>	<0.2	3.4	<0.31	<b>1.7</b>
MW-23D	<0.23	0.38	<0.26	<0.22	<0.2	3.3	<0.31	<b>2.6</b>
MW-23I1	<0.23	1.4	<0.26	<b>2.9</b>	<0.2	3.4	<0.31	<b>1.8</b>
MW-23I2	<0.23	12	<0.26	<b>10.1</b>	<0.2	3.6	<0.31	<0.44
CVB-15	<0.23	<0.26	<0.26	<0.22	<0.2	33.1	<0.31	<b>5.8</b>
UVB-1A (I)	<0.23	0.81	<0.26	0.28	<0.2	<0.24	<0.31	<0.44
UVB-2 (I)	NS	NS	NS	NS	<0.2	14.3	<0.31	<b>47.9</b>

**Notes**

< Indicates not detected

NS - Not Sampled

MCL - Maximum Contaminant Level

Bold text/gray shading

All concentrations reported in mg/L

Ground Water Analytical Results for Wells Reporting at Least One MCL Exceedance  
June 2009 through December 2013

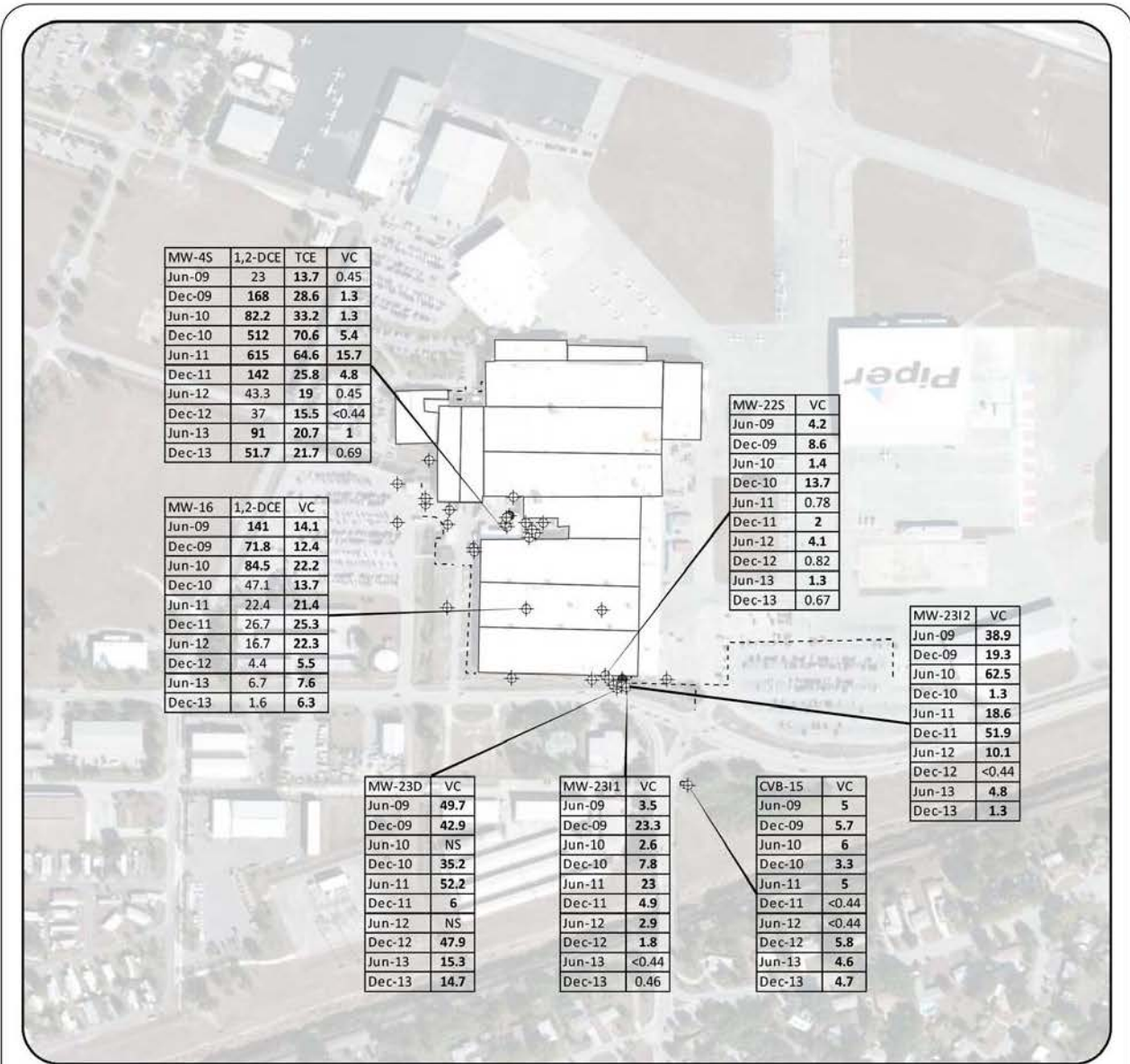
	Jun-13				Dec-13			
	1,1-DCE	cis-1,2-DCE	TCE	VC	1,1-DCE	cis-1,2-DCE	TCE	VC
<b>MCL</b>	7	70	3	1	7	70	3	1
MW-4S	0.21	<b>91</b>	<b>20.7</b>	<b>1</b>	<0.2	51.7	<b>21.7</b>	0.69
MW-5	<0.2	<0.24	1.3	<0.44	<0.2	0.27	1.6	<0.44
MW-16	<0.2	6.7	<0.31	<b>7.6</b>	<0.2	1.6	<0.31	<b>6.3</b>
MW-17	<0.2	3.1	<0.31	<0.44	<0.2	2.7	<0.31	<0.44
MW-18	<0.2	0.39	<0.31	<0.44	NS	NS	NS	NS
MW-19	<0.2	1.6	<0.31	<0.44	<0.2	2	<0.31	0.83
MW-20	<0.2	<0.24	<0.31	<0.44	<0.2	0.73	<0.31	0.8
MW-22S	<0.2	2.1	<0.31	<b>1.3</b>	<0.2	0.63	<0.31	0.67
MW-23S	<0.2	0.71	<0.31	<b>1.1</b>	<0.2	2.3	<0.31	<b>1.5</b>
MW-23D	<0.2	0.89	<0.31	<0.44	<0.2	0.68	<0.31	<0.44
MW-23I1	<0.2	0.69	<0.31	<0.44	<0.2	0.64	<0.31	0.46
MW-23I2	<0.2	3	<0.31	<b>4.8</b>	<0.2	0.39	<0.31	<b>1.3</b>
CVB-15	<0.2	21.2	<0.31	<b>4.6</b>	<0.2	21.2	<0.31	<b>4.7</b>
UVB-1A (I)	<0.2	0.64	<0.31	<0.44	<0.2	0.52	<0.31	<0.44
UVB-2 (I)	<0.2	6.1	<0.31	<b>15.3</b>	<0.2	4.9	<0.31	<b>14.7</b>

**Notes**

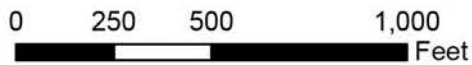
- < indicates not detected
- NS - Not Sampled
- MCL - Maximum Contaminant Level
- Bold text/gray shading indicates MCL exceedance
- All concentrations reported in mg/L



# Appendix H. Monitoring Well Concentrations



Sources: Esri, DeLorme, AND, Tele Atlas, First American, UNEP-WCMC, USGS.



- Legend**
- ⊕ Monitoring Well
  - ◆ UVB Well
  - Fencing





NORTH

**Piper Aircraft Corp./Vero Beach Water and Sewer Dept. Superfund Site**  
City of Vero Beach, Indian River County, Florida

## Appendix I. O&M Costs

### Piper Aircraft, Inc.

J/E	DocNum	Acct	Date	Per.	Year	Desc	Amount
GAJ	30000530	22481	12/31/2013	12	2013	Reclass PRT4-5900 (Supplier 00620) (ACCUTEST LABORATORIES SOUTHEAST,INC)	2,407.50
GAJ	30000530	22481	12/31/2013	12	2013	Reclass PRT4-6090 (Supplier 00620) (ACCUTEST LABORATORIES SOUTHEAST,INC)	507.50
GAJ	30000530	22481	12/31/2013	12	2013	Reclass PRT4-6129 (Supplier 00620) (ACCUTEST LABORATORIES SOUTHEAST,INC)	3,507.50
GAJ	30000530	22481	12/31/2013	12	2013	Reclass PRT4-6333 (Supplier 00620) (ACCUTEST LABORATORIES SOUTHEAST,INC)	407.50
GAJ	30000530	22481	12/31/2013	12	2013	Reclass PRT4-6344 and APR3-47090 (Supplier 30609) (RUBBER & ACCESSORIES INC.)	517.88
<b>2013 Total (Audited Financials)</b>							<b><u>7,347.88</u></b>

2013 Additional 2,882.98

**2013 Grand Total 10,230.86**

J/E	DocNum	Acct	Date	Per.	Year	Desc	Amount
MPP	20008365	22481	01/10/2012	1	2012	ACCUTEST LABORATORIES SOUTHEAS	2,407.50
MPP	20008957	22481	04/09/2012	4	2012	ACCUTEST LABORATORIES SOUTHEAS	207.50
GAJ	20000253	22481	06/29/2012	6	2012	Reclass EPO2-346 (BARNEY'S PUMPS, INC)	1,207.00
GAJ	20000263	22481	06/29/2012	6	2012	Reclass PRT4-5450 (RUBBER & ACCESSORIES INC.)	228.00
MAP	20009546	22481	07/10/2012	7	2012	ACCUTEST LABORATORIES SOUTHEAS	3,307.50
GAJ	20000302	22481	08/24/2012	8	2012	Reclass PRT4-5570 & PRT4-5578 (RAINFOREST IRRIGATION)	1,210.00
MPP	20010159	22481	10/05/2012	10	2012	ACCUTEST LABORATORIES SOUTHEAS	407.50
<b>2012 Total (Audited Financials)</b>							<b><u>8,975.00</u></b>

2012 Additional 245.09

**2012 Grand Total 9,220.09**

J/E	DocNum	Acct	Date	Per.	Year	Desc	Amount
MPP	10008823	22481	01/07/2011	1	2011	ACCUTEST LABORATORIES SOUTHEAS	2,207.50
MPP	10008946	22481	02/02/2011	2	2011	BARNEY'S PUMPS, INC	497.22
MPP	10009787	22481	04/08/2011	4	2011	ACCUTEST LABORATORIES SOUTHEAS	615.00
MCR	10000961	22481	07/01/2011	6	2011	CROSBY, RUTH	51.20
MPP	10010786	22481	06/13/2011	6	2011	RUBBER & ACCESSORIES INC.	470.88
MPP	10011191	22481	07/05/2011	7	2011	GHC SPECIALTY BRANDS, INC. DBA	175.22
MPP	10011312	22481	07/08/2011	7	2001	ACCUTEST LABORATORIES SOUTHEAS	3,507.50
MAP	10007969	22481	09/08/2011	9	2011	EPA HAZARDOUS SUBSTANCE SUPERF	2,067.06

MPP	10013294	22481	10/07/2011	10	2011 ACCUTEST LABORATORIES SOUTHEAS	407.50
MPP	10013296	22481	10/25/2011	10	2011 BARNEY'S PUMPS, INC	411.84
MPP	10013778	22481	12/07/2011	12	2011 RUBBER & ACCESSORIES INC.	485.36

2011 Total 10,896.28

J/E	DocNum	Acct	Date	Per.	Year	Desc	Amount
MPP	90003241	22481	12/15/2009	1	2010	PRODUCT RECOVERY MANAGEMENT	329.56
MPP	90003458	22481	01/27/2010	1	2010	BARNEY'S PUMPS, INC	468.24
CDT	90000272	22481	02/15/2010	2	2010	ACCUTEST LABORATORIES SOUTHEAST,INC	207.50
MAP	90002660	22481	11/05/2009	2	2010	INDIAN RIVER ARMATURE	422.65
MPP	90003538	22481	01/08/2010	2	2010	ACCUTEST LABORATORIES SOUTHEAST,INC	2,115.00
MAP	90003668	22481	04/06/2010	5	2010	ACCUTEST LABORATORIES SOUTHEAST,INC	407.50
MAP	90005076	22481	04/06/2010	6	2010	ACCUTEST LABORATORIES SOUTHEAST,INC	407.50
APC	90000034	22481	07/21/2010	7	2010	ACCUTEST LABORATORIES SOUTHEAST,INC	407.50
MPP	90005882	22481	08/05/2010	8	2010	ACCUTEST LABORATORIES SOUTHEAST,INC	3,407.50
MAP	90004687	22481	09/15/2010	9	2010	EPA HAZARDOUS SUBSTANCE SUPERFUND	15,421.27
MPP	90006881	22481	11/05/2010	11	2010	ACCUTEST LABORATORIES SOUTHEAST,INC	257.50
MPP	90007102	22481	12/07/2010	12	2010	RUBBER & ACCESSORIES INC.	447.77

2010 Total 24,299.49

J/E	DocNum	Acct	Date	Per.	Year	Desc	Amount
MPP	90000094	22481	12/08/2008	1	2009	HOMELAND IRRIGATION CENTER	48.57
MPP	90000116	22481	01/06/2009	1	2009	ACCUTEST LABORATORIES SOUTHEAS	4,557.50
MPP	90000363	22481	02/04/2009	2	2009	OFFICE PRODUCTS & SERVICES INC	16.67
MPP	90000944	22481	04/07/2009	4	2009	BARNEY'S PUMPS, INC	438.11
MCR	90000142	22481	04/30/2009	5	2009	CROSBY, RUTH	11.69
MPP	90001112	22481	04/06/2009	5	2009	ACCUTEST LABORATORIES SOUTHEAS	407.51
MPP	90001413	22481	06/09/2009	6	2009	RUBBER & ACCESSORIES INC.	624.02
MCR	90000206	22481	06/29/2009	6	2009	CROSBY, RUTH	30.20
MPP	90001961	22481	07/20/2009	9	2009	ACCUTEST LABORATORIES SOUTHEAS	3,607.50
MCR	90000306	22481	10/02/2009	10	2009	US ENVIRONMENTAL PROTECTION AG	28,121.85
MPP	90002710	22481	11/05/2009	11	2009	ACCUTEST LABORATORIES SOUTHEAS	207.50
MPP	90003036	22481	11/17/2009	12	2009	ACCUTEST LABORATORIES SOUTHEAS	207.50
MPP	90002960	22481	11/30/2009	12	2009	RUBBER & ACCESSORIES INC.	312.02
MCR	90000437	22481	12/31/2009	12	2009	CROSBY, RUTH	27.10

2009 Total 38,617.74



J/E	DocNum	Acct	Date	Per.	Year	Desc	Amount
MPP	80006721	22481	01/08/2008	1	2008	ACCUTEST LABORATORIES SOUTHEAS	4,427.50
MPP	80007036	22481	01/14/2008	2	2008	GLOBAL ENVIRONMENTAL ENGINEERI	3,575.00
MCR	80000878	22481	02/22/2008	2	2008	CROSBY, RUTH	48.14
MPP	80008689	22481	04/04/2008	4	2008	AMERICAN DRILLING SERVICES, IN	20,887.60
MPP	80008734	22481	03/26/2008	4	2008	HARBOR BRANCH ENVIRONMENTAL	2,931.00
MCR	80001156	22481	05/29/2008	6	2008	PRODUCT RECOVERY MANAGEMENT	319.29
MPP	80009504	22481	05/23/2008	6	2008	GLOBAL ENVIRONMENTAL ENGINEERI	1,100.00
MPP	80009594	22481	05/29/2008	6	2008	RUBBER & ACCESSORIES INC.	577.80
MCR	80001202	22481	06/17/2008	6	2008	BARKER, ROY	21.43
MCR	80001206	22481	06/20/2008	6	2008	DEPARTMENT OF BUSINESS AND	125.00
MPP	80009842	22481	06/12/2008	6	2008	A-1 METAL SUPPLY CORPORATION	322.22
MCR	80001245	22481	06/27/2008	7	2008	CROSBY, RUTH	41.40
MPP	80010937	22481	08/07/2008	8	2008	ACCUTEST LABORATORIES SOUTHEAS	4,687.50
MPP	80011444	22481	09/12/2008	9	2008	BARNEY'S PUMPS, INC	547.19
MCR	80001507	22481	09/27/2008	9	2008	CROSBY, RUTH	20.91
MPP	80012351	22481	10/30/2008	11	2008	ACCUTEST LABORATORIES SOUTHEAS	527.50
MCR	80001626	22481	11/12/2008	11	2008	EPA HAZARDOUS SUBSTANCES SUPER	3,064.36
MPP	80012691	22481	11/24/2008	12	2008	GRAINGER	196.17
MPP	80012732	22481	12/03/2008	12	2008	PARK'S RENTAL INC VERO BEACH	189.00
MCR	80001702	22481	12/19/2008	12	2008	CROSBY, RUTH	64.27
MPP	80013067	22481	11/24/2008	12	2008	LOWE'S COMPANIES INC	86.88
<b>2008 Total</b>							<b><u>43,760.16</u></b>