FIRST FIVE-YEAR REVIEW REPORT

FOR THE

COMBUSTION, INC. SUPERFUND SITE
LIVINGSTON PARISH, LOUISIANA

February 2011

PREPARED FOR:

United States Environmental Protection Agency
Region 6
Dallas, Texas

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FIRST FIVE-YEAR REVIEW REPORT
COMBUSTION, INC. SUPERFUND SITE
EPA ID NO. LAD072606627
LIVINGSTON PARISH, LOUISIANA

This memorandum documents the U.S. Environmental Protection Agency's (EPA) performance, determinations, and approval of the Combustion, Inc. Superfund Site's (Site) first five-year review (FYR) under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code § 9621(c), as provided in the attached Report.

Background

Combustion, Inc. is located approximately 3 miles northeast of Denham Springs, Louisiana, at Milton Road and Burgess Road. The Site is the location of a former waste oil recycling facility which operated from the late 1960s until the early 1980s and consisted of a small processing plant (referred to as the Process Area), a Pond Area, and a connecting pipeline. Two basic operational processes existed at the Site: oil reclamation and wastewater treatment.

There are three operable units (OUs) at the Site: a Source Control OU (the soil OU), a Management of Migration OU (the ground water OU), and an Other Off-Site Areas OU. The third OU, the Other Off-Site Areas OU was added to the Site to address offsite areas identified by a 1988 Louisiana Department of Environmental Quality (LDEQ) survey.

In the early 1980s, citizen complaints to the Water Pollution Control Division (WPCD) under the Department of Natural Resources triggered the performance of multiple inspections at the Site. A lack of response on the part of the site owner resulted in a recommendation in 1983 for an enforcement action at the Site (WPCD 1983).

Following the preliminary remedial investigation, the PRPs entered into an agreement with LDEQ (dated July 14, 1992) to participate in an Expedited Removal Action (ERA) at the Site.

During late 1992 and through 1993, the ERA resulted in removal of surface materials from the site, as well as liquids, sludges, and contaminated soils from the ponds and tanks. The ERA removed the wastes that constituted the principal threat wastes at the site and disposed of the wastes offsite. The ERA activities removed wastes from the Process Area until the residential risk-based cleanup levels were met and removed wastes from the Pond Area until industrial risk-based cleanup levels were met. Residual contaminants remaining at the site constitute low level threat wastes, which were subject to evaluation in the Remedial Investigation (RI) for the site. The ERA resulted in the removal of: aboveground storage tanks, a truck tanker, and tank contents; underground storage tanks and tank contents; miscellaneous debris and foundation material; oil; solidified sludge and paraffin; impacted soil; the pipeline; and wastewater.

In 1997, a remedial investigation that included human health and ecological risk assessments was performed. Based on the results of the risk assessments, the RI recommended that the feasibility study (FS) address contaminants in the upper water-bearing zone ground water at the Process

Area. The RI evaluation of the third OU, Other Off-Site Areas, areas which have not been known to be associated with the Site except through their physical proximity and through resident reports from a door-to-door survey, were determined to need no remedial action (WCIA 1997). Moreover, the Pond Area was designated for industrial uses only. As a consequence, the subsequent FS focused on alternative responses to the Management of Migration OU, the Site ground water (URS Corporation [URS] 2001).

In 2004, the Record of Decision (ROD) was prepared to address the Site as one operable unit, the Management of Migration OU. The ROD stated that no principal threat wastes remain on site and the proposed remedial action was identified as "phytoremediation plus monitored natural attenuation" with a hot spot treatment contingency (EPA 2004a).

The Combustion, Inc. Site Remediation Group, LLC (CISRG), which was formed by the PRPs to facilitate site remediation activities, is implementing the requirements of the ROD. CISRG purchased the property containing the former Process Area, former parking lot, and former Pond Area of Combustion, Inc. In addition to the former Combustion, Inc. property, the CISRG has purchased approximately 31 acres surrounding the former Process Area. The ground water monitoring well network for the former Process Area is located on CISRG property (EPA 2004a).

To implement the ROD, the LDEQ and the Participating Parties entered into a *Cooperative Agreement* (CA) on March 25, 2005. The CA specified the work activities required to design, install, operate, and monitor the Remedial Action (RA). With LDEQ conditional approval of the Remedial Action Work Plan on January 26, 2006, the RA was initiated by the PRPs in March 2006. The conditional approval required an updated operation and maintenance schedule that was later finalized. The selected remedy was installed as planned, and no additional areas of contamination were found (LDEQ and EPA 2006).

This First FYR for the Site was performed through a review of site documents and site-specific requirements, the site inspection performed on May 20, 2010, interviews with stakeholders, and a review of data collected at the Site during the review period. The selected remedy for Site's Management of Migration OU presented in the ROD is phytoremediation plus monitored natural attenuation. Phytoremediation consists of the planting of trees in and downgradient from the former Process Area. Trees were planted to establish a full canopy and deep root system to maximize ground water capture and transpiration. Natural attenuation is the process whereby contaminants in ground water are degraded by natural processes including biodegradation, chemical oxidation, and chemical transformation. In addition, institutional controls were placed in order to prevent human exposure to contaminated soil and ground water. No community concerns were identified during the review.

Based on the information available during the First FYR, the selected remedy for the Combustion, Inc. site has achieved the ROD criterion set for the first FYR and is performing as intended. Despite an estimated two-year interruption/setback in tree development as a result of Hurricanes Katrina, Rita, and Gustav, the remedy has met all expectations. The remedy review findings are listed below.

- Ground water quality achieved the interim ROD goal of 10% reduction in mean concentration of tracking constituents ahead of the scheduled five-year review.
- Significant shrinkage in plume mass and the absence of contaminants of concern (COCs) plume migration has been documented for the site.
- No vertical migration of COCs into the lower water-bearing zone has been demonstrated for the site.
- Ground water trends in selected individual monitor wells show dramatic reductions in tracking constituents including a 3 to 10 fold or greater decrease in 2,4/2,6 toluenediamine (TDA) and 1,2 dichloroethane (EDC) concentrations. This is significant as remediation completion will be determined using the primary line of evidence; groundwater concentration data.
- Establishment and maintenance of a robust stand of trees has been achieved, even through adverse weather conditions experienced at the site including major hurricanes.
- Uptake of ground water is positively demonstrated through sap flow measurements thus indicating through a secondary line of evidence that the trees are inhibiting movement of groundwater contamination and providing contaminant mass removal. Though there have been limited detections of site contaminants in tree core tissue samples and a level of uncertainty exists, the estimated detections of toluene within the tree tissue shows a connection with and uptake of the contaminated ground water as this is the source of toluene contamination at the site.
- Detection of degradation (or daughter) products provides a strong indication of the effectiveness of the natural attenuation and phytoremediation removal processes.
- Public acceptance of the remedy from the local community was provided through interviews with community residents and public officials.
- Beautification of the community was provided by the trees and continued site maintenance.
- Institutional Controls (ICs) have been filed and are enforced by both LDEQ and the PRPs to restrict site use to industrial/commercial and restrict ground water use for any purpose.

During the FYR process, several issues for continued improvement were identified and should be evaluated for implementation or should continue in order to support and confirm remedy performance. These are presented in the following section.

Summary of First FYR Findings

This section describes issues associated with the Site that were identified during the First FYR:

1. Ground water concentrations for the two tracking contaminants, EDC and TDA, met the 10% reduction in geometric mean concentration criteria specified in the ROD.

2. No vertical migration of COCs into the lower water-bearing zone has been demonstrated for the site.

3. The trends for the tracking constituents, TDA and EDC, are not similar for all COCs.

4. Daughter compounds, such as toluene, are increasing above the cleanup levels due to degradation.

5. Detection limits for some compounds are at or above the cleanup levels.

6. Establishment of a phytoremediation-induced gradient was inconclusive.

7. Several biochemical parameters sampled to support Monitored Natural Attenuation (MNA), may indicate a change in the site conditions that could influence the continued effectiveness of the MNA component of the remedy.

8. Several parameters measured in support of phytoremeditation provided limited useful information to demonstrate contaminant biodegradation.

9. The number of data points used to verify BIOCHLOR and BIOSCREEN modeling is limited.

10. To date, both the EDC and TDA plumes have shrunk and the decay rate constants are decreasing rather than staying constant or increasing, suggesting that the ROD-required Buscheck and Alcantar method may no longer be applicable.

11. The cleanup level for *cis* 1,2-dichloroethene is set at 0.518 mg/L, which is significantly higher than the Maximum Contaminant Level (MCL) of 0.07 mg/L.

12. The human health risk assessment did not evaluate volatilization from ground water to indoor air for the Process Area.

13. Human health risk assessment methodologies for dermal and inhalation toxicity have changed since the assessment was performed at the site.

Actions Needed

Based on the issues identified, the following recommendations are made for the Combustion, Inc. Superfund Site:

1. Implementation of the Hot Spot Treatment Contingency remedy as described in the ROD, is not necessary.

2. No contamination has been identified in the lower water-bearing zone. In order to verify no migration occurs and that the Remedial Action Objectives (RAOs) continue to be met for this unit, the lower water-bearing zone will be monitored for all COCs prior to each five-year review.

3. As the parent contaminants degrade and the daughter products increase, focus should shift from the target contaminants, EDC and TDA, to a more comprehensive reporting that includes all parent contaminants. All COCs will continue to be monitored semi-

annually; therefore, future annual reports should include trend graphs and plume delineation figures for all parent COCs. Text discussion should be considered for those that are below the ROD cleanup level, infrequently detected, or isolated to one or two well locations.

4. As the parent contaminants degrade and the daughter products increase, focus should shift from the target contaminants, EDC and TDA, to a more comprehensive reporting that includes all daughter contaminants. All COCs will continue to be monitored semi-annually; therefore, future annual reports should include trend graphs and plume delineation figures for all daughter COCs. Text discussion should be considered for those that are below the ROD cleanup level, infrequently detected, or isolated to one or two well locations.

5. Coordination with the laboratory to obtain lower detection limits should continue while lower detection limits for those wells considered not impacted should be requested. The PRPs currently work closely with the selected laboratory and are aware of the issues (remedy performance and analytical error) related to having detection limits at or near the cleanup levels. The laboratory has difficulty in obtaining lower detection for wells that are impacted by high concentrations of contaminants and this is expected to be resolved as these concentrations decrease over time. However, for those wells considered not impacted and/or downgradient, analytical methods and laboratories should be able to achieve, ideally, sample quantitation limits an order of magnitude below the cleanup level so that performance of the remedy can be assessed and analytical error is not significant. If sample matrix interferes with the analysis, usefulness of and consideration of reporting both the pre- and post-dilution laboratory results should be discussed. Updates regarding this issue will be summarized and presented in the annual reports.

6. In accordance with the ROD, the Phytoremediation component was included as an enhancement to natural attenuation and designed to plant trees within and downgradient of the process area to inhibit movement of ground water contaminants toward the downgradient perimeter of the contamination and to degrade contaminants within the plume. Sap flow measurements indicate that the trees are extracting contaminated ground water. Tree core sampling data presented estimated detections of daughter products, were not consistent from year to year, and were not consistent within the same tree. These issues present uncertainty in the data; however, estimated detections of toluene within the tree tissue shows a connection with and uptake of the contaminated ground water as this is the source of toluene contamination at the site. In addition, phytodegradation may be the primary process for contaminant degradation within the tree. This process would breakdown the site contaminants through the metabolic process rendering potential detection of site contaminants low. Although no significant change in the ground water gradient has been noted, evidence of plume mass reduction and the lack of plume migration, either down gradient or vertically, support the intended purpose of the Phytoremediation stands as described in the ROD. Sap flow monitoring, tree core monitoring, and water level monitoring will continue to be implemented according to the schedule presented in the December 2005 Field Sampling Plan (FSP) in order to document that Phytoremediation continues to extract and degrade COCs.

7. MNA biochemical parameters will continue to be monitored and reported prior to each five-year review. These parameters are primary indicators of site conditions that demonstrate the continued capacity of the site to support contaminant degradation in areas outside of the Phytoremediation areas. These parameters coupled with parent and daughter contaminant concentrations and distributions should be used to monitor plume dynamics (reducing, stable, expanding).

8. Rhizosphere sampling (soil, soil gas and microbial), transpiration gas, and tree stand health indicators should not be continued. Data provided through rhizosphere and transpiration gas sampling indicates that these degradation pathways are not significant. The tree stands at the site are established, robust, and healthy; therefore, annual detailed measurements and observations related to individual tree health are no longer necessary. However, the tree stands should be visually inspected during site maintenance work by the arborist to verify continued tree growth and overall health. General reporting on overall tree stand health should be included in the annual reports.

9. Current site conditions support continued operation of the Phytoremediation plus natural attenuation remedy. The ground water monitoring program provides data used to confirm the primary lines of evidence necessary to evaluate the remedy and includes sampling for parent contaminants, daughter contaminants, contaminant concentration reduction over time, hydraulic flow patterns, natural attenuation biochemical markers, and Phytoremediation parameters (tree tissue and sap flow). The continued use of the BIOSCREEN and BIOCHLOR screening predictive models will be based on site parameters, primarily, the condition of the plume (shrinking, steady, expanding), contaminant concentrations, and the natural attenuation biochemical markers. Use of the BIOSCREEN and BIOCHLOR screening models will be reviewed during each annual report to determine whether its use will be necessary during the next Five-Year review.

10. Current site conditions support continued operation of the Phytoremediation plus natural attenuation remedy. Buscheck and Alcantar (1995) rate constants are calculated and used to evaluate contaminant degradation. This method applies regression techniques and analytical solutions to estimate the overall attenuation of stable dissolved phase plumes. Site data show the plumes to be shrinking and the contaminant concentrations to be reducing. The continued use of the Buscheck and Alcantar (1995) rate constant methodology will be based on site parameters, primarily, the condition of the plume (shrinking, steady, expanding), contaminant concentrations, and the natural attenuation biochemical markers. Use of the Buscheck and Alcantar (1995) rate constant methodology is currently used to evaluate EDC and TDA as these are the tracking contaminants. As site contaminants degrade and daughter products become more prevalent, applicability and the use of decay rate constants, or the use of other models/calculations, as they relate to parent and daughter products will be reviewed in each annual report. All site COCs, parent and daughter, will continue to be evaluated at each monitoring well through the use of first-order decay trend graphs.

11. Currently, the ground water pathway is incomplete, and will remain restricted from use through enforcement of the ICs by both the LDEQ and the PRPs. The concentrations of cis 1,2-dichloroethene are below the cleanup level established in the ROD and the current MCL. This contaminant will continue to be monitored and reported in each annual report to document continued attainment of both the MCL and ROD cleanup level.

12. Currently this pathway is incomplete. The site will remain restricted to industrial/commercial use through enforcement of the ICs by both the LDEQ and the PRPs. The Louisiana Risk Evaluation/Corrective Action Program (RECAP) evaluation provided in the December 8 PRP letter, indicates that the indoor air exposure pathway is not a concern. Attainment of the RAOs will indicate that all ground water cleanup levels in the ROD have been achieved, and it is expected that no ground water contamination will be present at levels of concern. Therefore, no human health exposure under the indoor air pathway would be expected. The necessity for further evaluation of this pathway will be reviewed should the potential for reuse and construction be proposed.

13. Currently the ground water pathway is incomplete. The primary driver in the risk assessment evaluation of ground water was ingestion. Changes associated with the dermal and inhalation pathways are not significant and do not alter the ROD decision to address ground water contamination. The land use will remain restricted to industrial/commercial use and the ground water will remain restricted from any use through enforcement of the ICs by both the LDEQ and the PRPs. The ROD cleanup levels were re-evaluated by the responsible parties and presented in the December 8 PRP letter followed by the December 13 PRP letter. Based on this review, the ROD cleanup levels continue to be appropriate cleanup levels for the site ground water. An update, review, and evaluation of the ROD cleanup levels will be performed prior to each five-year review to determine whether the ROD cleanup levels continue to be appropriate.

Determinations

Based on the information available during the First FYR, the selected remedy for the Combustion Inc. site is currently performing as intended. The remedy is considered protective because ICs are in place; therefore, there are no current or potential exposures. The recommendations and follow-up actions identified in this FYR process should be addressed or continued for long-term remedy protectiveness of human health and the environment until RAOs are met.

By: Pamela Phillips, Acting _____ 2/11/11
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FIRST FIVE-YEAR REVIEW REPORT
COMBUSTION, INC. SUPERFUND SITE
EPA ID No. LAD072606627

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LIST OF ACRONYMS

1,2-DCA	1,2-dichloroethane
amsl	above mean sea level
ARAR	Applicable or Relevant and Appropriate Requirement
AST	aboveground storage tank
AVG	average
bgs	below ground surface
CA	cooperative agreement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CISRG	Combustion, Inc. Site Remediation Group, LLC
CO_2	carbon dioxide
COC	contaminant of concern
Combustion	Combustion, Inc.
EA	EA Engineering, Science, and Technology, Inc.
EDC	1,2-dichloroethane
EPA	U.S. Environmental Protection Agency Region 6
ERA	Expedited Removal Action
DO	dissolved oxygen
FOC	fraction of organic carbon
FS	feasibility study
FSP	field sampling plan
FYR	five-year review
HHRA	human health risk assessment
HI	hazard index
IC	institutional control
LAI	leaf area index
LDEQ	Louisiana Department of Environmental Quality
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MNA	monitored natural attenuation
MPN	most probable number
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List

O_2	oxygen
O&M	operation and maintenance
ORP	oxidation/reduction potential
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PRG	preliminary remediation goal
PRP	potentially responsible party
PVC	polyvinyl chloride
RA	remedial action
RAO	remedial action objective
RAWP	Remedial Action Work Plan
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RDL	reporting limit
RDWP	Remedial Design Work Plan
RECAP	Louisiana Risk Evaluation/Corrective Action Program
RI	remedial investigation
RME	reasonable maximum exposure
ROD	Record of Decision
RSL	risk screening level
Site	Combustion, Inc. Superfund Site
TDA	2,4/2,6 toluenediamine
TOC	total organic carbon
TSCA	Toxic Substance Control Act
URS	URS Corporation
UST	underground storage tank
VOC	volatile organic compound
WCC	Woodward-Clyde Consultants
WCIA	Woodward-Clyde International-Americas
WPCD	Water Pollution Control Division

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency Region 6 (EPA) has conducted the First Five-Year Review (FYR) of the remedial actions (RAs) implemented at the Combustion, Inc. (Combustion) Superfund Site (Site), located in Livingston Parish, Louisiana. The Combustion, Inc. site is the location of a former waste oil recycling facility, approximately 3 miles northeast of Denham Springs, Louisiana (Figure 1). The purpose of this FYR was to determine whether the selected remedy for the Site continues to protect human health and the environment. This review was conducted from May 2010 to October 2010 and included the general activities performed since the initiation of the remedial action in February 2006 through May 2010. The findings of this review and conclusions are documented in this report. This is the first FYR for the Site.

Several documents were reviewed as part of this FYR, including but not limited to the Preliminary Remedial Investigation Report, Expedited Removal Action (ERA) Report, the Remedial Investigation (RI) report, the Phase II RI report, the Feasibility Study (FS), the Record of Decision (ROD), the Preliminary Close-out Report, and annual ground water monitoring reports for 2006, 2007, 2008, 2009 and 2010.

Dubose Oil Company and subsequently Combustion, Inc. operated the site primarily as a used oil reclamation facility from the 1960s until the early 1980s. Approximately 2,000 people live within a 1-mile radius of the site. Surrounding features include undeveloped property and single-family residences.

The Combustion Site consisted of a small processing plant (referred to as the Process Area), a Pond Area, and a connecting pipeline. Two basic operational processes existed at the Site: oil reclamation and wastewater treatment.

There are three operable units (OUs) at the Site: a Source Control OU (the soil OU), a Management of Migration OU (the ground water OU), and an Other Off-Site Areas OU. The third OU, the Other Off-Site Areas OU, was added to the Site to address offsite areas identified by a 1988 Louisiana Department of Environmental Quality (LDEQ) survey.

In the early 1980s, citizen complaints to the Water Pollution Control Division (WPCD) under the Department of Natural Resources triggered in multiple inspections at the Site. A lack of response on the part of the site owner resulted in a recommendation in 1983 for an enforcement action at the Site (WPCD 1983). Subsequently, the following activities took place at the Site:

- An ERA was performed during late 1992 and through 1993. The ERA resulted in the removal of surface materials from the site, as well as liquids, sludges, and contaminated soils from the ponds and tanks. The ERA removed the wastes that constituted the principal threat wastes at the site and disposed of the wastes offsite. The ERA activities removed wastes from the Process Area until the residential risk-based cleanup levels were met, and removed wastes from the Pond Area until industrial risk-based cleanup levels were met. Residual contaminants remaining at the site constitute low-level threat wastes, which were subject to evaluation in the RI for the site. The ERA resulted in the removal of: aboveground storage tanks, a truck tanker, and tank contents; underground storage tanks and tank contents; miscellaneous debris and foundation material; oil; solidified sludge and paraffin; impacted soil; the pipeline; and wastewater.
- In 1997, an RI that included human health and ecological risk assessments was performed. Based on the results of the risk assessments, the RI recommended that: 1) the feasibility study address contaminants in the upper water-bearing zone ground water at the Process Area; 2) the third OU, the Other Off-Site Areas, which had not been associated with the Site except by physical proximity and through resident reports from a door-to-door survey, needed no remedial action (WCIA 1997); and 3) the Pond Area be designated for industrial uses only and required no further action.
- The subsequent FS focused on alternative responses for the Management of Migration OU, for the ground water impact (URS Corporation [URS] 2001a).
- The FS was completed in 2001 and had the following preliminary remedial action objectives:
    1. Prevent migration of upper water-bearing zone ground water impacted by site-related contaminants at concentrations greater than maximum contaminant levels (MCLs) south of the locations of the downgradient perimeter monitoring wells (MW-210S, MW-211S, and MW-212S). For contaminants with no established MCL, the acceptable concentration is a risk-based concentration or the quantitation limit, whichever is higher.
    2. Restore ground water quality in the impacted area to the extent practicable.
- In 2004, the ROD was prepared to address the Site as one operable unit, the Management of Migration Operable Unit. The ROD stated that no principal threat wastes remained on site and the proposed remedial action was identified as phytoremediation plus monitored natural attenuation with a hot spot treatment contingency (EPA 2004a).
- With LDEQ conditional approval of the Remedial Action Work Plan on January 26, 2006, the RA was initiated by the Participating Parties in March 2006. The selected remedy was installed as planned, and no additional areas of contamination were found (LDEQ and EPA 2006).

This First FYR for the Site was performed through a review of site documents and site-specific requirements, the site inspection performed on May 20, 2010, interviews with stakeholders, and a review of data collected at the Site during the review period. The inspection verified the condition of the trees that make up the Phytoremediation remedy, as well as monitoring well condition and the integrity of fencing surrounding the Site. Residents living in the vicinity of the Site were also interviewed. The inspection revealed that the access to the Site, in particular to the Pond Area, where use is restricted to industrial operations, is controlled. No concerns were noted during the Site visit regarding the Site management and operation. In addition, interviews with local residents living near the site did not reveal any concerns.

One other requirement of a FYR is to determine if there are any new requirements that may pertain to the Site. The risk assessment methodologies have changed (e.g. dermal toxicity adaptation and vapor intrusion). No other newly promulgated requirements that pertain to the Site were identified.

Since this is a statutory site that requires ongoing five-year reviews, the next review will be conducted within five years of the completion of this FYR report. This review included the general activities performed since the inception of the remedy implementation in February 11, 2006 (LDEQ and EPA 2006).

Based on the information available during the First FYR, the selected remedy for the Combustion, Inc. site has achieved the ROD criterion set for the first FYR and is performing as intended. Despite an estimated two-year interruption/setback in tree development as a result of Hurricanes Katrina, Rita, and Gustav, the remedy has met all expectations. The remedy review findings are listed below.

- Ground water quality achieved the interim ROD goal of 10% reduction in mean concentration of tracking constituents ahead of the scheduled five-year review.
- Significant shrinkage in plume mass and the absence of contaminants of concern (COCs) plume migration has been documented for the site.
- No vertical migration of COCs into the lower water-bearing zone has been demonstrated for the site.

- Ground water trends in selected individual monitor wells show dramatic reductions in tracking constituents including a 3 to 10 fold or greater decrease in 2,4/2,6 toluenediamine (TDA) and 1,2 dichloroethane (EDC) concentrations. This is significant as remediation completion will be determined using the primary line of evidence; groundwater concentration data.
- Establishment and maintenance of a robust stand of trees has been achieved, even through adverse weather conditions experienced at the site including major hurricanes.
- Uptake of ground water is positively demonstrated through sap flow measurements thus indicating through a secondary line of evidence that the trees are inhibiting movement of groundwater contamination and providing contaminant mass removal. Though there have been limited detections of site contaminants in tree core tissue samples and a level of uncertainty exists, the estimated detections of toluene within the tree tissue shows a connection with and uptake of the contaminated ground water as this is the source of toluene contamination at the site.
- Detection of degradation (or daughter) products provides a strong indication of the effectiveness of the natural attenuation and phytoremediation removal processes.
- Public acceptance of the remedy from the local community was provided through interviews with community residents and public officials.
- Beautification of the community was provided by the trees and continued site maintenance.
- ICs have been filed and are enforced by both LDEQ and the PRPs to restrict site use to industrial/commercial and restrict ground water use for any purpose.

During the FYR process, several issues for continued improvement were identified and should be evaluated for implementation or should continue in order to support and confirm remedy performance. The following issues were noted:

1. Ground water concentrations for the two tracking contaminants, 1,2-dichloroethane and 2,4/4,6 toluenediamine, met the 10% reduction in geometric mean concentration criteria specified in the ROD.

2. No vertical migration of COCs into the lower water-bearing zone has been demonstrated for the site.

3. The trends for the tracking constituents, TDA and EDC, are not similar for all COCs.

4. Daughter compounds, such as toluene, are increasing above the cleanup levels due to degradation.

5. Detection limits for some compounds are at or above the cleanup levels.

6. Establishment of a phytoremediation-induced gradient was inconclusive.

7. Several biochemical parameters sampled to support MNA, may indicate a change in the site conditions that could influence the continued effectiveness of the MNA component of the remedy.

8. Several parameters measured in support of phytoremeditation provided limited useful information to demonstrate contaminant biodegradation.

9. The number of data points used to verify BIOCHLOR and BIOSCREEN modeling is limited.

10. To date, both the EDC and TDA plumes have shrunk and the decay rate constants are decreasing rather than staying constant or increasing, suggesting that the ROD-required Buscheck and Alcantar method may no longer be applicable.

11. The cleanup level for *cis* 1,2-dichloroethene is set at 0.518 mg/L, which is significantly higher than the Maximum Contaminant Level (MCL) of 0.07 mg/L.

12. The human health risk assessment did not evaluate volatilization from ground water to indoor air for the Process Area.

13. Human health risk assessment methodologies for dermal and inhalation toxicity have changed since the assessment was performed at the site.

The following actions are needed in response to these issues:

1. Implementation of the Hot Spot Treatment Contingency remedy as described in the ROD is not necessary.

2. No contamination has been identified in the lower water-bearing zone. In order to verify no migration occurs and that the RAOs continue to be met for this unit, the lower water-bearing zone will be monitored for all COCs prior to each five-year review

3. As the parent contaminants degrade and the daughter products increase, focus should shift from the target contaminants, EDC and TDA, to a more comprehensive reporting that includes all parent contaminants. All COCs will continue to be monitored semi-annually; therefore, future annual reports should include trend graphs and plume delineation figures for all parent COCs. Text discussion should be considered for those that are below the ROD cleanup level, infrequently detected, or isolated to one or two well locations.

4. As the parent contaminants degrade and the daughter products increase, focus should shift from the target contaminants, EDC and TDA, to a more comprehensive reporting that includes all daughter contaminants. All COCs will continue to be monitored semi-annually; therefore, future annual reports should include trend graphs and plume delineation figures for all daughter COCs. Text discussion should be considered for

those that are below the ROD cleanup level, infrequently detected, or isolated to one or two well locations.

5. Coordination with the laboratory to obtain lower detection limits should continue while lower detection limits for those wells that are considered not impacted should be requested. The PRPs currently work closely with the selected laboratory and are aware of the issues (remedy performance and analytical error) related to having detection limits at or near the cleanup levels. The laboratory has difficulty in obtaining lower detection for wells that are impacted by high concentrations of contaminants and this is expected to be resolved as these concentrations decrease over time. However, for those wells considered not impacted and/or downgradient, analytical methods and analytical laboratories should be able to achieve, ideally, sample quantitation limits an order of magnitude below the cleanup level so that performance of the remedy can be assessed and analytical error is not significant. If sample matrix interferes with the analysis, usefulness of and consideration of reporting both the pre- and post-dilution laboratory results should be discussed. Updates regarding this issue will be summarized and presented in the annual reports.

6. In accordance with the ROD, the Phytoremediation component was included as an enhancement to natural attenuation and designed to plant trees within and downgradient of the process area to inhibit movement of ground water contaminants toward the downgradient perimeter of the contamination and to degrade contaminants within the plume. Sap flow measurements indicate that the trees are extracting contaminated ground water. Tree core sampling data presented estimated detections of daughter products, were not consistent from year to year, and were not consistent within the same tree. These issues present uncertainty in the data; however, estimated detections of toluene within the tree tissue shows a connection with and uptake of the contaminated ground water as this is the source of toluene contamination at the site. In addition, phytodegradation may be the primary process for contaminant degradation within the tree. This process would breakdown the site contaminants through the metabolic process rendering potential detection of site contaminants low. Although no significant change in the ground water gradient has been noted, evidence of plume mass reduction and the lack of plume migration, either down gradient or vertically, support the intended purpose of the Phytoremediation stands as described in the ROD. Sap flow monitoring, tree core monitoring, and water level monitoring will continue to be implemented according to the schedule presented in the December 2005 Field Sampling Plan (FSP) in order to document that Phytoremediation continues to extract and degrade COCs.

7. MNA biochemical parameters will continue to be monitored and reported prior to each five-year review. These parameters are primary indicators of site conditions that demonstrate the continued capacity of the site to support contaminant degradation in areas outside of the Phytoremediation areas. These parameters coupled with parent and daughter contaminant concentrations and distributions should be used to monitor plume dynamics (reducing, stable, expanding).

8. Rhizosphere sampling (soil, soil gas and microbial), transpiration gas, and tree stand health indicators should not be continued. Data provided through rhizosphere and transpiration gas samplings indicate that these degradation pathways are not significant. The tree stands at the site are established, robust, and healthy; therefore, annual detailed measurements and observations related to individual tree health are no longer necessary. However, the tree stands should be visually inspected during site maintenance work by the arborist to verify continued tree growth and overall health. General reporting on overall tree stand health should be included in the annual reports.

9. Current site conditions support continued operation of the Phytoremediation plus natural attenuation remedy. The ground water monitoring program provides data used to confirm the primary lines of evidence necessary to evaluate the remedy and includes sampling for parent contaminants, daughter contaminants, contaminant concentration reduction over time, hydraulic flow patterns, natural attenuation biochemical markers, and Phytoremediation parameters (tree tissue and sap flow). The continued use of the BIOSCREEN and BIOCHLOR screening predictive models will be based on site parameters, primarily, the condition of the plume (shrinking, steady, expanding), contaminant concentrations, and the natural attenuation biochemical markers. Use of the BIOSCREEN and BIOCHLOR screening models will be reviewed during each annual report to determine whether it's use will be necessary during the next Five-Year review.

10. Current site conditions support continued operation of the Phytoremediation plus natural attenuation remedy. Buscheck and Alcantar (1995) rate constants are calculated and used to evaluate contaminant degradation. This method applies regression techniques and analytical solutions to estimate the overall attenuation of stable dissolved phase plumes. Site data show the plumes to be shrinking and the contaminant concentrations to be reducing. The continued use of the Buscheck and Alcantar (1995) rate constant methodology will be based on site parameters, primarily, the condition of the plume (shrinking, steady, expanding), contaminant concentrations, and the natural attenuation biochemical markers. Use of the Buscheck and Alcantar (1995) rate constant methodology is currently used to evaluate EDC and TDA as these are the tracking contaminants. As site contaminants degrade and daughter products become more prevalent, applicability and the use of decay rate constants, or the use of other models/calculations, as they relate to parent and daughter products will be reviewed in each annual report. All site COCs, parent and daughter, will continue to be evaluated at each monitoring well through the use of first-order decay trend graphs.

11. Currently, the ground water pathway is incomplete, and will remain restricted from use by enforcement of the ICs by both the LDEQ and the PRPs. The concentrations of cis1,2-dichloroethene are below the cleanup level established in the ROD and the current MCL. This contaminant will continue to be monitored and reported in each annual report to document continued attainment of both the MCL and ROD cleanup level.

12. Currently this pathway is incomplete. The Site will remain restricted to industrial/commercial use through enforcement of the ICs by both the LDEQ and the PRPs. The RECAP evaluation provided in the December 8 PRP letter, indicates that the

indoor air exposure pathway is not a concern. Attainment of the RAOs will indicate that all ground water cleanup levels in the ROD have been achieved, and it is expected that no ground water contamination will be present at levels of concern. Therefore, no human health exposure under the indoor air pathway would be expected. The necessity for further evaluation of this pathway will be reviewed should the potential for reuse and construction be proposed.

13. Currently the ground water pathway is incomplete. The primary driver in the risk assessment evaluation of ground water was ingestion. Changes associated with the dermal and inhalation pathways are not significant and do not alter the ROD decision to address ground water contamination. The land use will remain restricted to industrial/commercial use and the ground water will remain restricted from any use through enforcement of the ICs by both the LDEQ and the PRPs. The ROD cleanup levels were re-evaluated by the responsible parties and presented in the December 8 PRP letter followed by the December 13 PRP letter. Based on this review, the ROD cleanup levels continue to be appropriate cleanup levels for the site ground water. An update, review, and evaluation of the ROD cleanup levels will be performed prior to each five-year review to determine whether the ROD cleanup levels continue to be appropriate.

The Combustion, Inc. PRPs are primarily responsible for implementing these actions.

Based on the information available during the first FYR, the selected remedy for the Combustion Inc. site is currently performing as intended. The remedy is considered protective because ICs are in place; therefore, there are no current or potential exposures. The recommendations and follow-up actions identified in this FYR process should be addressed or continued for long-term remedy protectiveness of human health and the environment until RAOs are met.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name (from Waste LAN): Combustion, Inc. Superfund Site

EPA ID (from Waste LAN): LAD072606627

Region: 6 | **State:** Louisiana | **City/County:** Denham Springs/Livingston Parish

SITE STATUS

NPL Status: ☒ Final ☐ Deleted ☐ Other (specify) Not Listed

Remediation Status (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete

Multiple OUs?* ☒ YES ☐ NO **Construction Completion Date:** April 4, 2006 (prefinal Remedy implementation inspection)

Has site been put into reuse? ☐ YES ☒ NO

REVIEW STATUS

Reviewing Agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author Name: Ms. Katrina Higgins-Coltrain

Author Title: Remedial Project Manager | **Author Affiliation:** EPA Region 6

Review Period:** May 2010 to October 2010

Date(s) of Site Inspection: May 19, 2010

Type of Review: ☒ Statutory ☐ Policy ☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion

Review Number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering Action:

☒ Actual RA Onsite Construction at OU ☐ Actual RA Start ☐ Construction Completion ☐ Previous Five-Year Review Report ☐ Other (specify) _____

Triggering Action Date: RA was initiated on February 11, 2006

Due Date (Five Years After Triggering Action Date): February 2011

* OU refers to operable unit.

** The review period refers to the period during which the five-year review was conducted.

Five-Year Review Summary Form (Continued)

Based on the information available during the First FYR, the selected remedy for the Combustion, Inc. site has achieved the ROD criterion set for the first FYR and is performing as intended. Despite an estimated two-year interruption/setback in tree development as a result of Hurricanes Katrina, Rita, and Gustav, the remedy has met all expectations. The remedy review findings are listed below.

- Ground water quality achieved the interim ROD goal of 10% reduction in mean concentration of tracking constituents ahead of the scheduled five-year review.
- Significant shrinkage in plume mass and the absence of COCs plume migration has been documented for the site.
- No vertical migration of COCs into the lower water-bearing zone has been demonstrated for the site.
- Ground water trends in selected individual monitor wells show dramatic reductions in tracking constituents including a 3 to 10 fold or greater decrease in TDA and EDC concentrations. This is significant as remediation completion will be determined using the primary line of evidence; groundwater concentration data.
- Establishment and maintenance of a robust stand of trees has been achieved, even through adverse weather conditions experienced at the site including major hurricanes.
- Uptake of ground water is positively demonstrated through sap flow measurements thus indicating through a secondary line of evidence that the trees are inhibiting movement of groundwater contamination and providing contaminant mass removal. Though there have been limited detections of site contaminants in tree core tissue samples and a level of uncertainty exists, the estimated detections of toluene within the tree tissue shows a connection with and uptake of the contaminated ground water as this is the source of toluene contamination at the site.
- Detection of degradation (or daughter) products provides a strong indication of the effectiveness of the natural attenuation and phytoremediation removal processes.
- Public acceptance of the remedy from the local community was provided through interviews with community residents and public officials.
- Beautification of the community was provided by the trees and continued site maintenance.
- ICs have been filed and are enforced by both LDEQ and the PRPs to restrict site use to industrial/commercial and restrict ground water use for any purpose.

During the FYR process, several issues for continued improvement were identified and should be evaluated for implementation or should continue in order to support and confirm remedy performance. The following issues were noted.

Issues:

1. Ground water concentrations for the two tracking contaminants, EDC and TDA, met the 10% reduction in geometric mean concentration criteria specified in the ROD.

2. No vertical migration of COCs into the lower water-bearing zone has been demonstrated for the site.

3. The trends for the tracking constituents, TDA and EDC, are not similar for all COCs.

4. Daughter compounds, such as toluene, are increasing above the cleanup levels due to degradation.

5. Detection limits for some compounds are at or above the cleanup levels.

6. Establishment of a phytoremediation-induced gradient was inconclusive.

7. Several biochemical parameters sampled to support MNA, may indicate a change in the site conditions that could influence the continued effectiveness of the MNA component of the remedy.

8. Several parameters measured in support of phytoremeditation provided limited useful information to demonstrate contaminant biodegradation.

9. The number of data points used to verify BIOCHLOR and BIOSCREEN modeling is limited.

10. To date, both the EDC and TDA plumes have shrunk and the decay rate constants are decreasing rather than staying constant or increasing, suggesting that the ROD-required Buscheck and Alcantar method may no longer be applicable.

11. The cleanup level for *cis* 1,2-dichloroethene is set at 0.518 mg/L, which is significantly higher than the MCL of 0.07 mg/L.

12. The human health risk assessment did not evaluate volatilization from ground water to indoor air for the Process Area.

13. Human health risk assessment methodologies for dermal and inhalation toxicity have changed since the assessment was performed at the site.

Recommendations and Follow-up Actions:

1. Implementation of the Hot Spot Treatment Contingency remedy as described in the ROD is not necessary.

2. No contamination has been identified in the lower water-bearing zone. In order to verify no migration occurs and that the RAOs continue to be met for this unit, the lower water-bearing zone will be monitored for all COCs prior to each five-year review

3. As the parent contaminants degrade and the daughter products increase, focus should shift from the target contaminants, EDC and TDA, to a more comprehensive reporting that includes all parent contaminants. All COCs will continue to be monitored semi-annually; therefore, future annual reports should include trend graphs and plume delineation figures for all parent COCs. Text discussion should be considered for those that are below the ROD cleanup level, infrequently detected, or isolated to one or two well locations.

4. As the parent contaminants degrade and the daughter products increase, focus should shift from the target contaminants, EDC and TDA, to a more comprehensive reporting that includes all daughter contaminants. All COCs will continue to be monitored semi-annually; therefore, future annual reports should include trend graphs and plume delineation figures for all daughter COCs. Text discussion should be considered for those that are below the ROD cleanup level, infrequently detected, or isolated to one or two well locations.

5. Coordination with the laboratory to obtain lower detection limits should continue while lower detection limits for those wells that are considered not impacted should be requested. The PRPs currently work closely with the selected laboratory and are aware of the issues (remedy performance and analytical error) related to having detection limits at or near the cleanup levels. The laboratory has difficulty in obtaining lower detection for wells that are impacted by high concentrations of contaminants and this is expected to be resolved as these concentrations decrease over time. However, for those wells considered not impacted and/or downgradient, analytical methods and analytical laboratories should be able to achieve, ideally, sample quantitation limits an order of magnitude below the cleanup level so that performance of the remedy can be assessed and analytical error is not significant. If sample matrix interferes with the analysis, usefulness of and consideration of reporting both the pre- and post-dilution laboratory results should be discussed. Updates regarding this issue will be summarized and presented in the annual reports.

6. In accordance with the ROD, the Phytoremediation component was included as an enhancement to natural attenuation and designed to plant trees within and downgradient of the process area to inhibit movement of ground water contaminants toward the downgradient perimeter of the contamination and to degrade contaminants within the plume. Sap flow measurements indicate that the trees are extracting contaminated

ground water. Tree core sampling data presented estimated detections of daughter products, were not consistent from year to year, and were not consistent within the same tree. These issues present uncertainty in the data; however, estimated detections of toluene within the tree tissue shows a connection with and uptake of the contaminated ground water as this is the source of toluene contamination at the site. In addition, phytodegradation may be the primary process for contaminant degradation within the tree. This process would breakdown the site contaminants through the metabolic process rendering potential detection of site contaminants low. Although no significant change in the ground water gradient has been noted, evidence of plume mass reduction and the lack of plume migration, either down gradient or vertically, support the intended purpose of the Phytoremediation stands as described in the ROD. Sap flow monitoring, tree core monitoring, and water level monitoring will continue to be implemented according to the schedule presented in the December 2005 FSP in order to document that Phytoremediation continues to extract and degrade COCs.

7. MNA biochemical parameters will continue to be monitored and reported prior to each five-year review. These parameters are primary indicators of site conditions that demonstrate the continued capacity of the site to support contaminant degradation in areas outside of the Phytoremediation areas. These parameters coupled with parent and daughter contaminant concentrations and distributions should be used to monitor plume dynamics (reducing, stable, expanding).

8. Rhizosphere sampling (soil, soil gas and microbial), transpiration gas, and tree stand health indicators should not be continued. Data provided through rhizosphere and transpiration gas samplings indicate that these degradation pathways are not significant. The tree stands at the site are established, robust, and healthy; therefore, annual detailed measurements and observations related to individual tree health are no longer necessary. However, the tree stands should be visually inspected during site maintenance work by the arborist to verify continued tree growth and overall health. General reporting on overall tree stand health should be included in the annual reports.

9. Current site conditions support continued operation of the Phytoremediation plus natural attenuation remedy. The ground water monitoring program provides data used to confirm the primary lines of evidence necessary to evaluate the remedy and includes sampling for parent contaminants, daughter contaminants, contaminant concentration reduction over time, hydraulic flow patterns, natural attenuation biochemical markers, and Phytoremediation parameters (tree tissue and sap flow). The continued use of the BIOSCREEN and BIOCHLOR screening predictive models will be based on site parameters, primarily, the condition of the plume (shrinking, steady, expanding), contaminant concentrations, and the natural attenuation biochemical markers. Use of the BIOSCREEN and BIOCHLOR screening models will be reviewed during each annual report to determine whether its use will be necessary during the next Five-Year review.

10. Current site conditions support continued operation of the Phytoremediation plus natural attenuation remedy. Buscheck and Alcantar (1995) rate constants are calculated and used to evaluate contaminant degradation. This method applies regression techniques and

analytical solutions to estimate the overall attenuation of stable dissolved phase plumes. Site data show the plumes to be shrinking and the contaminant concentrations to be reducing. The continued use of the Buscheck and Alcantar (1995) rate constant methodology will be based on site parameters, primarily, the condition of the plume (shrinking, steady, expanding), contaminant concentrations, and the natural attenuation biochemical markers. Use of the Buscheck and Alcantar (1995) rate constant methodology is currently used to evaluate EDC and TDA as these are the tracking contaminants. As site contaminants degrade and daughter products become more prevalent, applicability and the use of decay rate constants, or the use of other models/calculations, as they relate to parent and daughter products will be reviewed in each annual report. All site COCs, parent and daughter, will continue to be evaluated at each monitoring well through the use of first-order decay trend graphs.

11. Currently, the ground water pathway is incomplete, and will remain restricted from use through enforcement of the ICs by both the LDEQ and the PRPs. The concentrations of cis 1,2-dichloroethene are below the cleanup level established in the ROD and the current MCL. This contaminant will continue to be monitored and reported in each annual report to document continued attainment of both the MCL and ROD cleanup level.

12. Currently this pathway is incomplete. The Site will remain restricted to industrial/commercial use through enforcement of the ICs by both the LDEQ and the PRPs. The RECAP evaluation provided in the December 8 PRP letter, indicates that the indoor air exposure pathway is not a concern. Attainment of the RAOs will indicate that all ground water cleanup levels in the ROD have been achieved, and it is expected that no ground water contamination will be present at levels of concern. Therefore, no human health exposure under the indoor air pathway would be expected. The necessity for further evaluation of this pathway will be reviewed should the potential for reuse and construction be proposed.

13. Currently the ground water pathway is incomplete. The primary driver in the risk assessment evaluation of ground water was ingestion. Changes associated with the dermal and inhalation pathways are not significant and do not alter the ROD decision to address ground water contamination. The land use will remain restricted to industrial/commercial use and the ground water will remain restricted from any use through enforcement of the ICs by both the LDEQ and the PRPs. The ROD cleanup levels were re-evaluated by the responsible parties and presented in the December 8 PRP letter followed by the December 13 PRP letter. Based on this review, the ROD cleanup levels continue to be appropriate cleanup levels for the site ground water. An update, review, and evaluation of the ROD cleanup levels will be performed prior to each five-year review to determine whether the ROD cleanup levels continue to be appropriate.

Protectiveness Statement:

Based on the information available during the First FYR, the selected remedy for the

Combustion Inc. site is currently performing as intended. The remedy is considered protective because ICs are in place; therefore, there are no current or potential exposures. The recommendations and follow-up actions identified in this FYR process should be addressed or continued for long-term remedy protectiveness of human health and the environment until RAOs are met.

1.0 INTRODUCTION

The U.S. Environmental Protection Agency Region 6 (EPA), with assistance from EA Engineering, Science, and Technology, Inc. (EA), and in coordination with the Louisiana Department for Environmental Quality (LDEQ) has conducted the first five-year review (FYR) of the remedial action (RA) implemented at the Combustion, Inc. Superfund Site (Site) in Livingston Parish, Louisiana. The purpose of a FYR is to determine whether the remedy at a site remains protective of human health and the environment and to document the methods, findings, and conclusions of the FYR process in a report. The report will identify issues found during each review, if any, and make recommendations to address the issues. This first FYR report documents the results of the review for the Site, conducted in accordance with EPA guidance (EPA 2001) on FYRs. The site was proposed for inclusion on EPA's National Priorities List (NPL) on June 20, 1986, and was re-proposed on June 24, 1988. The Site was listed on the NPL on August 31, 1990 (EPA 2004a and 2010).

The FYR process is required by federal statute. The EPA must implement FYRs consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c), 42 United States Code § 9621 (c), states the following:

> "*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 five 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.*"

NCP Section 300.430(f)(4)(ii) states the following:

> "*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 the initiation of the selected remedial action.*"

Because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure, a statutory FYR is required.

Preliminary Remedial Investigation/Feasibility Study (RI/FS) activities were structured to address two operable units: a "Source Control" Operable Unit and a "Management of Migration" Operable Unit. During the Phase II RI/FS activities, a third operable unit was added to address offsite areas identified by a 1988 LDEQ survey. The Source Control Operable Unit was addressed during the Expedited Removal Action performed during 1992-93. None of the offsite areas of the third operable unit were determined to need remedial action. Therefore, the selected remedy addresses the Site as one operable unit, the "Management of Migration" Operable Unit.

The triggering action for this statutory review is the initiation of the RA, which, according to the Preliminary Close-out Report (LDEQ and EPA 2006) took place in February 2006. The planting of Tree Stands F and G occurred in March 2006 (URS Corporation [URS] 2010b), and the baseline ground water monitoring was performed in April 2006. This first FYR spans the period from February 2006 through May 2010; its methods, findings, conclusions, and recommendations based on documents available in this time period are documented in this report.

This report documents the FYR for the Site by providing the following information: site chronology (Section 2.0); background information (Section 3.0); an overview of the RAs (Section 4.0); progress since the previous FYR (which in this case provides no evaluation since this is the first FYR performed for the Site) (Section 5.0); a discussion of the FYR process, activities and findings (Section 6.0); technical assessment of the Site (Section 7.0); institutional controls (ICs) (Section 8.0); issues noted with respect to RAs (Section 9.0); recommendations and follow-up actions (Section 10.0); protectiveness statement (Section 11.0); and discussion of the next review (Section 12.0). Attachment 1 provides a list of documents reviewed, Attachment 2 provides the Site inspection checklist, Attachment 3 provides Site survey forms, Attachment 4 provides the Site inspection photographs, Attachment 5 provides a copy of the Public Notice for Initiation of Five-Year Review, Attachment 6 contains the IC Covenant for Restriction of Use, Attachment 7 Potentially Responsible Parties (PRPs) Correspondence on

Recommendations & Follow-up Actions dated December 8, 2010, and Attachment 8 is the Response from the PRPs dated December 13, 2010.

2.0 SITE CHRONOLOGY

A chronology of events for the Site is provided in Table 1. Additional historical information is available online at http://www.epa.gov/region6/6sf/pdffiles/0600472.pdf.

3.0 BACKGROUND

This section discusses the Site's physical characteristics, land and resource use near the Site, history of Site contamination, initial response to the Site, and basis for the response.

3.1 PHYSICAL CHARACTERISTICS

The Site is the location of a former waste oil recycling facility located in Livingston Parish, Louisiana, approximately 3 miles northeast of Denham Springs. Dubose Oil Company and subsequently Combustion, Inc. operated the facility primarily for used oil reclamation from the late 1960s until the early 1980s. Two basic operational processes took place at the site: oil reclamation and wastewater treatment. The oil reclamation activities were performed in the former Process Area. The wastewater treatment system in the former Pond Area treated stormwater runoff and excess water from hydrocarbon recycling activities contaminated by oil or oily wastes (EPA 2004a).

Regional Hydrogeology

The regional hydrogeology was described in the Final Remedial Investigation Report (Woodward-Clyde International-Americas [WCIA] 1997).

The interbedded sands and clays present in Livingston Parish and surrounding areas comprise a complex system of fresh water aquifers that extend to depths of -3,200 feet (ft) above mean sea level (amsl). These aquifers comprise the Southern Hills Regional Aquifer System. The sands and clays of this system have been locally subdivided into as many as thirteen aquifer units.

However, sand layers are interfingering and probably function on a regional basis as fewer aquifer units. Within Livingston Parish, the major aquifers have been grouped into four units. The top of the first major aquifer unit, termed the Shallow Aquifer Unit, occurs at depths from about -200 feet amsl (or about 250 feet below ground surface) to -700 feet amsl near Interstate Highway 12 south of the Combustion, Inc. site. The Shallow Aquifer Unit is correlated with the Pleistocene Citronelle Formation. The next underlying aquifer unit, Aquifer Unit 1, is composed of two sand units and occurs at approximate depths from -830 feet amsl to -1,200 feet amsl. Aquifer Unit 2 and Aquifer Unit 3 are the deepest regional aquifers and are composed of multiple sands. These aquifers extend from about -1,700 feet to about -3,100 feet amsl. In addition to the four major regional aquifer units noted above, several shallow sands (shallower than 200 feet below ground surface [bgs]) are present throughout the area and overlie the regional Shallow Aquifer Unit discussed above. These shallow sands constitute local shallow zones of variable hydraulic conductivity and limited areal extent. These sands are generally not more than 40 to 50 feet thick and correlate with the Holocene Quaternary alluvial deposits.

Ground water recharge occurs principally by precipitation on the Citronelle Formation where it crops out in southern Mississippi (north of Livingston Parish). The hydraulic gradient in the lower aquifer units in the northeastern Livingston Parish area may reverse from a downward and lateral direction to an upward direction into the Shallow Aquifer Unit. However, the regional upward flow pattern has been altered by the heavy pumping of ground water in the Baton Rouge area. The upward gradient is evidenced by numerous flowing wells completed in the lower sands (Aquifer Units 1 and 2) north-northeast of the site. The Shallow Aquifer Unit is confined, but is generally not characterized by flowing wells. In northwestern Livingston Parish the upward hydraulic gradient is reduced due to large withdrawal rates associated with municipal and industrial ground water usage in the Baton Rouge area.

The base of fresh water in the Livingston Parish area ranges from about -2500 feet amsl in the northeast to -3,200 feet amsl in the southeast. In the southern part of the parish salt water occurs at depths of approximately -1,200 feet amsl and is directly associated with the presence of the Baton Rouge Fault Zone. This indicates that the faulting serves as a barrier to lateral flow. Two public supply wells (Wells 127 and 175) are registered within the 2-mile radius of the site.

These wells are screened in the deeper, regional aquifers (Aquifer Units 1, 2, and 3) (WCIA 1997).

Site Hydrogeology

The Site hydrogeology was described in the Final Remedial Investigation Report (WCIA 1997). Locations of all Site monitoring wells, geological cross sections, as well as ground water elevation maps are depicted in the RI report (WCIA 1997). Refer to Figure 2 for monitoring well locations used as part of the monitoring network for the remedy performance.

Two water-bearing zones, the upper and lower water-bearing zones, have been identified in the vicinity of the former Process Area. Based on interpreted boring logs, these zones are 30 feet bgs, and the base was encountered at depths of 59 to 102 feet bgs. The upper water-bearing zone is composed mainly of sand, silty sand, and clayey silty sand materials. The lower water-bearing zone consists of sand, gravel, gravely sands, clayey sands, and silts. Because the upper water-bearing zone and the lower water-bearing zone at the site are hydraulically connected, they will be discussed as one unit (shallow ground water) for purposes of classification. Three EPA classes of ground water have been established on the basis of ground water value and vulnerability to contamination. The shallow ground water in the Process Area vicinity is classified as a Class IIB ground water unit. This is ground water that is potentially available for drinking water, agriculture, or other beneficial use.

Based on results of a door-to-door survey conducted during the Phase II RI (Woodward-Clyde Consultants [WCC] 1997), the ground water in the site vicinity is not used for drinking water, and nearby residences are on public water supply.

The residential area surrounding the Process Area is not supplied with public sewage treatment facilities. Each home in the area has its own septic system or equivalent sewage treatment/handling equipment. Several of these systems contain a polyvinyl chloride (PVC) pipe to discharge excess system flows to a ditch located at the front or rear of the property. These discharge pipes are visible along the road ditches. As a result of this practice, domestic septage from several of these residences is discharging into the nearby shallow water-bearing unit and surface water. Septage-laden surface water is discharging to the Drainage Canal via drainage

ditches along the rear lot lines of the residential roads. Fecal coliform was detected in the Drainage Canal and in monitoring well BW-3S (located north of the Process Area in the former parking lot). Because of the presence of domestic sewage in the shallow ground water and the availability of publicly supplied water, use of the shallow ground water as a domestic water supply is unlikely and undesirable.

A total of 48 monitoring wells have been installed on or near the Combustion, Inc. site to monitor water bearing zones in the Process Area. In the Process Area, seven wells are considered Interior Wells and monitor ground water in the source area of the Process Area (PW-01, PW-02, PW-03, PW-04, PW-05, PW-06 and MW-201), seven wells are considered Perimeter Wells and monitor ground water directly down gradient from the source area (MW-203, MW-204S, MW-205S, MW-208S, MW-213S, PW-12 and PW-13), and three wells are considered Sentinel Wells and are down gradient of the plume to provide down gradient plume control (MW-206,S, MW-207S, and MW-209S) (URS 2010b). One well, BW-3S is the upgradient well.

For the purpose of the RI and as addressed in the 2005 remedial design work plan (RDWP) and associated Sampling and Analysis Plan (URS 2005a), the two ground water units associated with the pond area were designated with the nomenclature of Zone 1 and Zone 2. A clay layer occurs within Zone 2 at some locations, but is not continuous across the area. Zone 1 occurs on average at 17 feet bgs, and has an average thickness of 20 feet. Isolated and discontinuous sand and silt pockets overlie Zone 1; these isolated pockets may be saturated. Zone 2 typically occurs at approximately 38 feet bgs, and the base of this zone has not been delineated.

In the Pond Area there are six wells installed in Zone 1, the shallow zone, (MW-01, MW-02, MW-04, MW-06S, MW-07S, and MW/B-09) and four wells to monitor Zone 2, the deeper zone (MW- 06D, MW-07D, MW-08D, and MW-05S) (URS 2010b).

During the August 2010 monitoring event in the Process Area the depth to ground water in the upper water-bearing zone monitoring wells was approximately 40.76 to 45.90 feet amsl and the depth to ground water in the lower water-bearing zones monitoring wells was approximately 42.32 to 45.25 feet amsl. During the August 2010 monitoring event in the Pond Area the depth to ground water in the Zone 1 monitoring wells was approximately 46.53 to 48.88 feet amsl and

the depth to ground water in Zone 2 monitoring wells was approximately 45.81 to 47.32 feet amsl.

Ground Water Flow Direction

Ground water in both the Pond Area Zone 1 and Process Area upper and lower water-bearing zones generally flows to the south. The direction of flow is consistent with regional ground water flow patterns and regional drainage patterns. Ground water in the Pond Area Zone 2 flows to the southwest. Potentiometric surfaces indicate the flow direction is influenced by the presence of the Drainage Canal, which is located immediately west of the Pond Area and runs north-south along the Pond Area.

3.2 LAND AND RESOURCE USE

The Combustion, Inc. site is located on the periphery of an isolated rural residential area surrounded by moderately to heavily wooded areas. Access is via narrow roads, and the site is not within any city limits. The dwellings in the immediate vicinity are predominantly single-family homes located east, west, and north of the Process Area.

The Pond Area is more isolated than the Process Area, with a stand of trees and the Drainage Canal separating the area from the nearest residence. The Pond Area is located in a high voltage transmission line right-of-way; the land to the east and west is wooded. The nearest dwellings are approximately 300 feet to the southwest. Future land use of the Pond Area is likely to remain as a utility corridor with restricted access and continued presence of the transmission towers and lines; use of the Pond Area for residential purposes is not viable (WCIA 1997).

The Process Area is located on the periphery of a relatively isolated rural residential area surrounded by moderately to heavily wooded areas. The dwellings in the immediate vicinity are predominately single-family homes located east, west, and north. To the south of the Process Area is a moderate to heavily wooded area. Residences in the vicinity are on a public water supply system; however, there are no public sewage treatment services available. The site is not within any city limits. However, the remoteness, poor access, limited area available and the existing residential use of the surrounding area indicate that future land use of the surrounding area will likely be residential (WCIA 1997).

3.3 HISTORY OF CONTAMINATION

The facility consisted of a small processing plant (the Process Area), a separate area containing a series of interconnected ponds (the Pond Area), and an interconnecting pipeline. The 2.5-acre Process Area contained 16 aboveground storage tanks (ASTs), a small tanker-truck, 11 underground storage tanks (USTs), a boiler, boiler shed, pump shed, and associated foundations, piping, sumps and containment walls. The 6.5 acre Pond Area contained 14 interconnected ponds (Ponds A through N) with total surface area of approximately 2.4 acres and an estimated capacity of approximately 4 million gallons. Two ASTs and one UST were also present in the Pond Area. In addition to the water and bottom sludge present in all of the ponds, five of the ponds also contained a floating oil layer. The two Site areas were connected by a pipeline. Dubose Oil Company and subsequently Combustion, Inc. operated primarily as used oil reclamation facilities from the late 1960s until the early 1980s. Two basic operational processes existed at the site: oil reclamation and wastewater treatment. The oil reclamation activities were performed in the former Process Area, and the wastewater treatment system in the former Pond Area treated stormwater runoff and excess water from hydrocarbon recycling activities contaminated by oil or oily wastes (EPA 2004a).

In the early 1980s, citizen complaints to the Water Pollution Control Division (WPCD) under the Department of Natural Resources triggered in multiple inspections at the Site. A lack of response on the part of the site owner resulted in a recommendation in 1983 for an enforcement action at the Site (WPCD 1983).

A RI/FS Work Plan was prepared and submitted to LDEQ on February 16, 1988. Following agency review and approval of the RI/FS Work Plan, field investigations were completed during the period December 1988 through April 1989. During the preliminary RI field activities, 35 drums containing wastes were removed for off-site disposal in accordance with a removal action authorized by LDEQ .

Following the preliminary remedial investigation, the Participating Parties, an entity composed by all the PRPs for the Site, entered into an agreement with LDEQ (dated July 14, 1992) to participate in an Expedited Removal Action (ERA) at the site.

Expedited Removal Action:

During late 1992 and through 1993, an ERA resulted in removal of surface materials from the site, as well as liquids, sludges, and contaminated soils from the ponds and tanks. The ERA removed the wastes that constituted the principal threat wastes at the site and disposed of the wastes offsite. The ERA activities removed wastes from the Process Area until the residential risk-based cleanup levels were met and removed wastes from the Pond Area until industrial risk-based cleanup levels were met. Residual contaminants remaining at the site constitute low level threat wastes, which were subject to evaluation in the Remedial Investigation for the site (WCC 1994).

During the ERA:

- 58,086 gallons of oil were recovered, blended, and transported off-site for use as an alternative fuel or disposal at a permitted hazardous waste incineration facility. Approximately one-half of the oil contained polychlorinated biphenyls (PCBs) and was disposed of at a Toxic Substance Control Act (TSCA)-permitted facility. The remainder of the oil, which was not a regulated material, was used as an alternative fuel at a Resource Conservation and Recovery Act (RCRA)-permitted facility.

- 11,297,162 gallons of water were treated on-site using a sequencing batch biological reactor and/or activated carbon, tested, and discharged. An additional 34,000 gallons of water were disposed off-site by permitted, commercial deep well-injection.

- 35,457 tons of solids including sludge, soil, stabilization fly ash, solidified paraffin, concrete and debris were transported off-site and disposed of at permitted landfills. Approximately 2,240 tons of these solids potentially contained PCBs above a regulatory threshold limit of 50 milligram per kilogram (mg/kg) and were therefore disposed of at a TSCA-permitted facility.

- 18 ASTs and a truck tanker were emptied, cleaned, wipe-tested, demolished, and cut up for scrap.

- 12 USTs were uncovered, emptied, and removed. Of these, 8 were cleaned, wipe-tested, and cut up as scrap. The small size of the remaining 4 tanks made it more cost-effective to dispose of the entire tank as hazardous waste rather than go to the expense of cleaning and wipe testing.

During the ERA, verification samples confirmed the residential risk-based cleanup values for the Process Area were met and the industrial risk-based cleanup values protective of utility workers in the Pond Area were met.

Phase II RI/FS

Following the ERA, a Phase II RI/FS was performed and the Phase II RI Report was completed (WCC 1997). This RI/FS addressed the three OUs at the Site: a Source Control OU (the soil OU), a Management of Migration OU (the ground water OU), and an Other Off-Site Areas OU. The third OU, the Other Off-Site Areas OU was added to the Site to address offsite areas identified by a 1988 LDEQ survey. The RI report was approved by the regulatory agencies on December 5, 1997.

A summary of the human health and ecological risk assessments performed in support of the RI is presented in the paragraphs below.

In the Process Area, the human health and ecological risk assessment (WCIA 1997) demonstrated a hazard index (HI) below 1 for construction workers, for both average (AVG) exposure and reasonable maximum exposure (RME), indicating that there are no significant noncarcinogenic health effects for the identified receptors. The excess lifetime cancer risk to the construction worker in the AVG exposure scenario (1 .1E-07) was below the EPA excess cancer risk benchmark range of 1.0E-04 to 1.0E-06. Similarly, the RME (8 .4E-07) was below the benchmark range. At the Pond Area, because no complete exposure pathways were identified for receptors within the fenced area of the Pond Area, no risks were quantified for any media and ICs that restrict the use of the land and ground water were recommended and later on implemented. Within the drainage canal and overflow area, the AVG exposure and RME were calculated for an older child visitor contacting Site contaminants present in off-site sediments in these areas. No HQs, HIs, or total HIs were calculated for older child exposure to sediments because there is no reference dose for benzo(a)pyrene evaluation of noncarcinogenic health effects. The excess lifetime cancer risks to the older child visitor were below the EPA excess

cancer risk benchmark range of 1.0E-04 to 1.0E-06 for both the RME and AVG exposure scenarios.

Regarding the ecological risk assessment, four major approaches or components were evaluated: the actual condition of the natural communities with their resident plant and animal populations, based on qualitative and quantitative biological indicators and evaluative tools; a comparison of water, soil, and sediment chemical concentrations at the site to regulatory criteria; a literature-based eco-toxicology assessment; and an exposure pathway assessment. All these assessments supported each other and independently and collectively lead to the same conclusion. The natural communities found at the Combustion, Inc. Site, together with their resident plant and animal populations, were robust and thriving and did not exhibit any effects from the Site-related chemicals (WCIA 1997).

Based on the risks identified, the RI made the following recommendations:

- Other off-site areas - no further action
- Drainage canal/overflow area – no further action
- Pond Area - post-closure ground water monitoring
- Process Area - develop remedial alternatives in Feasibility Study Report for upper water bearing zone ground water.

Feasibility Study

Remedial alternatives were developed and evaluated in the Feasibility Study (URS 2001a) for the Process Area upper water-bearing zone ground water, which has been impacted by Site activities. Dissolved phase contaminants at concentrations exceeding the appropriate maximum contaminant levels (MCLs) have migrated approximately 500 feet south of the former Process Area; however, the contaminants remain on the property owned by the Combustion, Inc. Site Remediation Group, LLC (CISRG).

In 2001, the Combustion, Inc. PRPs began a phytoremediation pilot study with the planting of trees in the former Process Area. Tree Stands A through E (Figure 2) were planted as part of the pilot study. Approximately 1,000 trees were planted at the Combustion, Inc. site during March 2001. These trees, planted in a grid pattern, were a 44% to 56% mix of poplar trees to

eucalyptus trees. Tree stand D is the control group of trees that was planted outside the eastern perimeter of the former Process Area.

In the fall of 2004, the PRPs initiated the optimization of the tree species used in the pilot study by utilizing an arborist. Tree replacement/replanting was completed during the winter of 2004/2005 using several native tree species better suited for the Combustion, Inc. Site. Improvements were also made to the drainage and irrigation system in these stands (URS 2010b). Hurricanes Katrina and Rita impacted the Combustion, Inc. site during August and September, 2005, delaying the kick off for the remedy implementation. Hurricane Katrina passed through on August 29, 2005, and initial recovery efforts occurred from August 30 through September 9, 2005. These efforts concentrated on staking the leaning trees while the ground remained moist from the storm's rain. Many mature trees from the 2001 planting could not be saved because they were uprooted or snapped off. These destroyed trees were removed from the existing tree stands and stacked up, along with branches that had blown off in the storm. On September 14, 2005, a detailed damage assessment noted that 165 trees had been destroyed by Hurricane Katrina. Before further recovery efforts could be undertaken, Hurricane Rita impacted the site on September 23 - 24, 2005, and a survey of the damage from Hurricane Rita was conducted on September 26, 2005. The tie lines on several of the post-Katrina staked trees snapped and the trees again bent in the high winds. Therefore, the initial field recovery effort again concentrated on repositioning tree stakes and restaking these leaning trees. A few of the trees fell completely over and uprooted themselves. Another 27 trees were lost due to Hurricane Rita (URS 2010b).

The PRPs replanted trees during winter 2005/06 at the planting sites where trees were hurricane damaged or required cutting in Tree Stands B and C (the interiors of the 1,2-dichloroethane [EDC] and 2,4/2,6-toluenediamines [TDA] plumes, respectively). Approximately 291 trees remained in the three Control Tree Stands (Stands A, D, and E) adjacent to the former Process Area. In total approximately 430 trees remained from the 2001 planting.

3.4 INITIAL RESPONSE

Combustion, Inc. began to close the facility late in 1980 and by May 1982 had completely shut down operations. Following citizens' complaints, the Water Pollution Control Division under the State of Louisiana Department of Natural Resources, Office of Environmental Affairs, recommended enforcement action at the Site. In October 1983, the LDEQ analyzed wastes from the site and found they contained PCBs, volatile organic chemicals, and heavy metals.

3.5 BASIS FOR TAKING ACTION

Based on data available for the Site and the hazard ranking performed in 1985, it was determined that hazardous substances could be released from the Site that could endanger public health, welfare, or the environment. The Site was proposed for the NPL on June 20, 1986, and was re-proposed on June 24, 1988. The Site was listed on the NPL on August 31, 1990 (EPA 2004a and 2010).

4.0 REMEDIAL ACTIONS

This section discusses the selected remedy, remedy implementation, O&M activities, and O&M costs.

4.1 SELECTED REMEDY

Based on the detailed evaluation and the comparative analysis, the selected remedial alternative was phytoremediation plus monitored natural attenuation (MNA). The ground water is monitored during implementation of the selected remedy to ensure that contaminants are not migrating horizontally off-site or vertically downward to a drinking water aquifer. This remedy was deemed more cost effective, innovative, and was estimated to achieve the RAOs in the same time frame (EPA 2004a).

The ROD (EPA 2004a) stated that Phytoremediation for the site would consist of the planting of trees in the former Process Area and in areas downgradient of the former Process Area, which do not currently have trees. The trees were planted to establish a full canopy and deep root system

to maximize ground water capture and transpiration. The trees required an initial two-year growing period to become established and begin tapping into the ground water.

The remedial action objectives (RAOs) as stated in the ROD are:

- To prevent upper water-bearing zone ground water impacted by site-related contaminants at concentrations greater than MCLs south of the locations of the downgradient perimeter monitoring wells (MW-210S, MW-211S, and MW-212S); for contaminants with no established MCL, the acceptable concentration is a risk-based concentration or the quantitation limit, whichever is higher.

- Restore ground water quality in the impacted area to the extent practicable.

The major elements of the remedy are as follows:

- Phytoremediation, as an enhancement to the natural attenuation, provides additional controls to prevent further lateral migration of contaminants in the ground water. The phytoremediation included planting and maintenance of trees in a manner designed to inhibit movement of ground water contaminants toward the downgradient perimeter of the contamination and to degrade contaminants within the plume. Establishment of the trees was expected to require two years, and once the trees had been properly established, the phytoremediation was intended to be primarily a passive remediation. The Remedial Design specified tree species, planting density, and planting procedures.

- MNA for ground water in the upper and lower water-bearing zones in the vicinity of the former Process Area includes monitoring for volatile organic compounds and TDA-related compounds. Analyses conducted on site ground water led to the selection of two compounds as tracking contaminants. EDC was selected as the tracking constituent for the volatile organic compounds (VOCs), while TDA was selected as the tracking constituent for the aromatic amine compounds. The behavior of these compounds is expected to be indicative of the behavior of similar compounds at the site.

- Natural attenuation of the ground water is evaluated using biogeochemical monitoring prior to each Five Year Review. Fate and transport modeling of the TDA and EDC plumes is also performed prior to the Five Year Review.

- Ground water in Zone 1 and Zone 2 (refer to Figures D.3 and D.4 of the FS [URS 2001b] for zone delineation) in the vicinity of the former Pond Area is monitored for volatile organic compounds. This ground water monitoring program was presented in Appendix D of the Feasibility Study (URS 2001b).

- Appendix E of the Feasibility Study (URS 2001c) is a Site Long-Term Care Plan which provides a framework for site upkeep during the remedial action.

- Hot-spot treatment was selected as the contingency remedy to provide additional treatment in the more highly contaminated areas of the ground water plume should the

selected remedy fail to meet the specified criteria when evaluated during the first Five Year review. The aromatic amines would be treated utilizing hydrogen peroxide and an iron catalyst and the chlorinated alkanes would be treated utilizing a hydrogen releasing compound.

- ICs in the form of conveyance notices to inform the public of Site conditions and restrictions are required for the Pond Area soils and the Pond and Process Area ground water. This IC will be enforced and monitored by LDEQ in accordance-with La. Rev. Stat. Ann. §30:2039 (2000) and La. Admin. Code tit. 33 Part 5 §3525 (2002), which requires the owner(s) of the facility property to record a notice in the mortgage and conveyance records of Livingston Parish.

To implement the ROD, the LDEQ and the Participating Parties entered into a Cooperative Agreement (CA) on March 25, 2005 (LDEQ and Combustion Inc. Participating Parties 2005). The CA specified the work activities required to design, install, operate, and monitor the RA. The following documents were prepared in accordance with the CA:

- Remedial Design Work Plan (RDWP) (June 3, 2005, revised August 15, 2005)
- Tree Stands F and G Phytoremediation Report (September 13, 2005)
- Process Area Field Sampling Plan (December 16, 2005)
- Remedial Action Work Plan (January 6, 2006).

The RDWP (URS 2005b) was conditionally approved by LDEQ in July 2005, and a final revised Process Area Field Sampling Plan (FSP) (URS 2005d), was prepared to support it. Two other documents essential to the implementation of the selected remedy were addressed in the RDWP: Tree Stands F and G Phytoremediation Design Report, and the Remedial Action Work Plan (RAWP). The RDWP describes how these two documents complement the Process Area Field Sampling Plan in implementing the selected remedy of phytoremediation plus monitored natural attenuation at the Combustion, Inc. site.

4.2 REMEDY IMPLEMENTATION

Phytoremediation

With LDEQ conditional approval of the RAWP on January 26, 2006, the RA was initiated by the Participating Parties on February 11, 2006. The conditional approval required an updated operation and maintenance schedule that was later finalized. The selected remedy was installed as planned, and no additional areas of contamination were found.

As required by the ROD, two new stands of trees (Tree Stands F and G) were planted during winter 2006. The two new tree stands were located to fill in areas to the south (downgradient) of the former Process Area that were not fully covered with existing natural, or self-seeded, trees. Drainage improvements for the two new tree stands and extension of the current irrigation system to these stands were designed to provide sufficient water for the newly planted trees to thrive. However, the drainage system was also designed to preclude tree damage that could result from water ponding around the bases of the trees for extended periods of time. The following types of trees were planted in Stands F and G during winter 2006: bald cypress, eastern cottonwood, loblolly pine, overcup oak, sycamore, spruce pine, tulip poplar, weeping willow, and willow oak. A total of 188 and 220 trees were planted in Strands F and G, respectively. Most of the trees were 0.75-inch to 1.5-inch stock grown in pots or cuttings of cottonwoods.

Monitored Natural Attenuation

No additional monitoring wells were required to be installed for the implementation of the ground water MNA remedy. Eight piezometers were installed 10 May 2005 to monitor the phytoremediation-induced ground water gradient changes. All monitoring wells were sampled in April 2006 to serve as the baseline event.

4.3 OPERATION AND MAINTENANCE

Phytoremediation

The maintenance requirements for phytoremediation were specified in the Tree Stands F and G Phytoremediaton Design Report (URS 2005c). According to this plan, during the first year, which was the 2006 growing season, the arborist would monitor conditions at the site and work with the site maintenance team to provide care for the trees. The site maintenance program consisted of a combination of watering, fertilizing, mowing, mulching/soil amending, pest control, and trimming. Subsequent maintenance was going to revert to the continuing maintenance program described in the *Site Management Plan* for the existing Tree Stands A through E, included as Appendix B of the RDWP (URS 2005a).

General operation and maintenance activities performed during the five years include maintaining perimeter fencing, gates, and mowing of the grass in both the Process and Pond Areas to comply with local regulations. Major maintenance and repairs that were performed in addition to regular maintenance required during the FYR period are discussed below.

In September 2008 Hurricane Gustav, followed by Hurricane Ike two weeks later, destroyed or partially uprooted 52% of all the trees planted to promote phytoremediation at the Combustion, Inc. site. The overall site ground water pumping capacity from Tree Stands A – G was reduced 33%. Restoration of the lost pumping capacity in the damaged phytoremediation system was expected to take at least two years. As a result, the PRPs provided a Force Majeure notification to the LDEQ on September 12, 2008 due to the damage from Hurricane Gustav. During 2009, a number of trees were planted to support hurricane recovery in Stands B, C, and F. It was also noted that cut stumps of numerous tree species are also producing new sprouts and re-growing tree canopy. This natural restoration process will replace the lost pumping capacity of the damaged system; however, replacement growth may require multiple (2 – 3) growing seasons (URS 2010b).

Ground Water Monitoring

Ground water monitoring was to be performed semi-annually at the site for five years to determine if the selected remedy of phytoremediation and MNA was meeting remedial action levels at the time of the Five Year Review. Ground water samples were analyzed by Method 8260 for volatile organic compounds and Method 8270 modified for aromatic amine compounds. Sampling for natural attenuation processes in the upper water-bearing zone were characterized during 1997 and 1998 sampling events, during the baseline sampling event in August 2006 and in August 2010 prior to the FYR.

The ground water samples were collected following the protocol outlined in the Process Area Field Sampling Plan (URS 2005d). Water levels were gauged in all monitoring wells prior to sample collection. Site monitoring wells were sampled semi-annually in 2006, 2007, 2008, 2009 and 2010. Table 2 includes a summary of the O&M and monitoring activities to be performed at the Site (URS 2005b, 2005c, and 2005d). Additional detail is provided in the following paragraphs. Analytical results are discussed in Section 6.4 of this report.

4.4 OPERATION AND MAINTENANCE COST

The 2004 ROD (EPA 2004a) identifies both capital costs and annual costs estimated for the implementation of the remedy as well as the annual expenses associated with the RA at the Site. Included in these costs are O&M, monitoring, and reporting requirements, as well as engineering, construction, permitting, and legal costs. The capital cost estimated in the ROD is $681,000, while annual costs were $36,500.

In 2007, the PRPs prepared and submitted the Interim RA Report (URS 2007b). Table 2 of this report details the cost incurred between May 2004 and April 2006 for the implementation of the remedy. At 2007 present worth, the ROD capital costs were $694,000. Between May 2004 and April 2006, the actual cost for maintaining and repairing (e.g., hurricane wind damage) the existing tree stands, developing the remedial action, and installing Tree Stands F and G was reported to be $1,333,000, significantly higher than initially estimated.

Annual reports were prepared for calendar years 2006, 2007, 2008, 2009. In addition, a 2010 annual report was submitted in August 2010; however, this report only covers the timeframe from December2009 through April 2010. No annual costs are depicted in the annual reports.

5.0 PROGRESS SINCE THE PREVIOUS FYR

This is the first FYR for the Combustion Superfund Site.

6.0 FYR PROCESS

This section presents the process and findings of the first FYR. Specifically, this section presents the findings of surveys; a site inspection; an Applicable or Relevant and Appropriate Requirements (ARARs) review; and a data review.

6.1 ADMINISTRATIVE COMPONENTS

The first FYR review team was lead by Ms. Katrina Higgins-Coltrain of the EPA (Remedial Project Manager) with field participation from Mr. Todd Thibodeaux, LDEQ Project Manager. Ms. Cristina Radu and Ms. Lane Andress, representatives from EA, assisted in the review process.

In April 2010, the review team established the review schedule, which included the following components:

- Community Involvement
- Document Review
- Data Review
- ARAR Review
- Site Inspection
- Site Interviews
- FYR Report Development and Review.

These components are discussed in the following subsections.

6.2 COMMUNITY INVOLVEMENT

A notice was published on May 2, 2010, announcing that EPA had initiated the FYR for this Site. A copy of this notice is included as Attachment 5 to this report. Upon signature, the first FYR report will be placed in the information repositories for the Site: the Livingston Parish Library in Denham Springs, LA; the LDEQ office in Baton Rouge, Louisiana; and the EPA Region 6 office in Dallas, Texas. A notice will then be published in the local newspaper to summarize the findings of the review and announce the availability of the report at the information repositories.

6.3 DOCUMENT REVIEW

This first FYR for the Site included a review of relevant Site documents, including the ERA report; RI and FS reports; the ROD issued for the only OU that required further action, the

Management of Migration OU; subsequent RD and RA reports and associated plans, annual reports for calendar year 2006, 2007, 2008, 2009 and an annual report covering December 2009 through April 2010 (URS 2007a, 2008, 2009, 2010a, 2010b). The complete list of documents reviewed during this First FYR is provided in Attachment 1.

6.4 DATA REVIEW

The following Annual Monitoring Reports and data contained within were available for review:

- 2006 Annual Report, Combustion, Inc. Site, Livingston Parish, Louisiana (URS 2007a)
- Remedial Action Year 2 (2007) Annual Monitoring Report, Combustion, Inc. Site, Livingston Parish, Louisiana (URS 2008)
- Remedial Action Year 3 (2008) Annual Monitoring Report, Combustion, Inc. Site, Livingston Parish, Louisiana (URS 2009)
- 2009 Annual Report Year 4 Remedy Implementation, Combustion, Inc. Site, Livingston Parish, Louisiana (URS 2010a)
- 2010 Annual Report Year 5 Remedy Implementation, Combustion, Inc. Site, Livingston Parish, Louisiana (URS 2010b).

The following sections summarize the major findings of these reports.

The Combustion Inc. Superfund Site originally consisted of three OUs: Source Control OU; Management of Migration OU; and Off-Site Other Areas OU. The Source Control and Off-Site Other Areas OUs have been determined to need no further remedial action. The Management of Migration OU is in Remedial Action and the subject to this FYR.

The only OU requiring remediation is the Management of Migration OU, which essentially is a ground water OU. The selected remedy for this OU was phytoremediation plus natural attenuation. A contingency was identified to supplement this remedy consisting of hot spot treatment. The selected remedy is intended to address residual shallow ground water contamination extending beneath and downgradient of the site. Analytical data and data analysis resulting from the field sampling and site monitoring program reported in the annual monitoring reports are designed to support performance assessment of the following components, which are further discussed below:

- Plume Delineation
- Plume Migration
- Phytoremediation
- MNA

Plume Delineation

Plume delineation was based on exceedances of standards for VOCs in monitoring wells; the input data consisted of ground water analytical data. Ground water collection and analysis was conducted on a semi-annual basis during 2006, 2007, 2008, and 2009 and once in April of 2010 for a total of nine times during the FYR reporting period. Ground water samples were analyzed for VOCs by Method SW8260B and Method 8270 for the aromatic amine compounds TDA and o-,p- toluidine. Although the Annual Monitoring Reports focused most of the analyses on two selected tracking contaminants, the ground water was sampled for all site COCs, including parent and daughter products for both the volatile and semivolatile fractions. EDC, analyzed under the VOC method, was selected as the tracking contaminant for the chlorinated VOCs, while TDA was selected as the tracking contaminant for the aromatic amines. The rationale being that the behavior of these compounds would be representative of the behavior of similar compounds at the site.

The principal criterion for determining the satisfactory performance of the selected remedy as well as the necessity for implementation of the contingency remedy, was to achieve a 10% reduction in geometric mean concentrations of two tracking constituents in the first five years (from 2006 to 2010). According to the 2010 Annual Report (URS 2010b), the mean concentration for EDC for April 2010 was 0.039 milligrams per liter (mg/L) compared to a FYR goal of 0.074 mg/L. More importantly, the April 2010 mean concentration of 0.039 mg/L for EDC was 68% less than the highest mean concentration (0.122 mg/L) for EDC observed in the past 4½ years. The lateral extent and peak concentrations of the EDC plume appear to have declined considerably over time. TDA concentrations have declined by almost an order of magnitude in the upper water-bearing zone from a geometric mean of 5.744 mg/L in 2006 to 0.721 mg/L in 2010. Moreover, the plume appears to be shrinking laterally. Similar results were observed for o-,p- toluidine.

Concentration trends for some daughter product COCs remain above the cleanup levels and do not demonstrate steep concentration reductions as the tracking contaminants do. For instance, toluene concentrations in well MW-201S have increased from 1.65 mg/L in 2006 to 8.82 mg/L in 2010, representing an increase of almost 8 times the cleanup level of 1 mg/L. This increase appears to be due to the degradation of TDA; a desired outcome. Concentrations of benzene remain relatively stable and constant with time. This infers that either Phytoremediation/MNA has not significantly contributed to contaminant destruction or that daughter production and contaminant destruction are linear. Nonetheless, plumes of these contaminants have not expanded or migrated downgradient and are considered to be stable. As part of the ground water monitoring activity, all daughter products are tracked and compared with the ROD cleanup levels. Ultimately, all site COCs will need to meet the ROD cleanup levels in order to achieve the RAOs.

The RAOs from the ROD state that the remedy shall prevent the ground water from impacting downgradient wells (i.e. MW-210S, MW-211S and MW-212S) and migrating vertically into the lower aquifer. The field sampling plan identified wells according to plume proximity. The upgradient well is located upgradient of the ground water plume. The interior wells are located within the plume boundaries while the perimeter wells are located on the perimeter of the plume. The sentinel wells are located downgradient of the ground water plume while Wells MW-210S, MW-211S and MW-212S, are located downgradient of the sentinel wells. If data from the sentinel wells indicate potential migration further downgradient, then wells MW-210S, MW-211S and MW-212S will be incorporated into the overall sampling plan. At this time, the upgradient sentinel wells do not indicate downgradient movement of site contaminants; therefore, MW-210S, MW-211S and MW-212S have not been sampled. However, the EDC concentration in a downgradient sentinel well, MW-206S, increased from below the cleanup level of 0.005 mg/L in 2006 to just above the cleanup level in 2009, at 0.00518 mg/L. One problem seems to be that the detection limit for EDC, similar to the detection limits for methylene chloride and tetrachloroethylene (PCE), are the same as the cleanup levels. When concentrations are measured in the vicinity of the detection limit, the analytical error is significant and an exceedance such as the one for EDC may only be representative of this error.

It should be noted that in some instances it was difficult to ascertain whether contaminant concentrations increased or decreased over time, especially in the most contaminated well MW-201, as the detection limits reported for the April 2010 sampling event were an order of magnitude greater than the detection limits reported for any of the other wells sampled at that time and from previous sampling events of the same well. Furthermore, the detection limits reported were an order of magnitude greater than the cleanup levels specified by the ROD. The data validation report for the 2010 sampling event explains that matrix interferences were responsible for the higher reporting limit (RDL) in the SW-846 8260B analysis of samples 21004125502 (PW-08), 21004125504 (MW-201), 21004125505, (PW-15), 21004125509 (MW-201MS), and 21004125510 (MW-201MSD). The samples had to be diluted to bracket the concentration of target compounds within the calibration range of the instrument. The dilutions are reflected in elevated detection limits that exceeded the cleanup levels.

In a response dated December 8, 2010, the PRP provided further clarification on detection limits (Attachment 7). The responsible party is aware of the issue and works closely with the laboratory to monitor and attain lower detection limits. Difficulty exists when contaminant concentrations exceed the calibration range of the laboratory analytical equipment. As the concentrations of the contaminants decrease over time, it is expected that the issue of high detection limits will be resolved as matrix interferences should be minimal. However, even in wells that are expected to be 'clean' (i.e., downgradient and lower water-bearing zone wells), the detection limits are reported at or just below the cleanup level. Given the response by the PRP, lower detection limits should be obtainable for those wells that have low or no concentrations of contaminants and should be requested during future sampling events.

The lower water-bearing zone does not appear to have been impacted as none of the ground water contaminant concentrations increased over time nor are they above clean-up levels.

Plume Migration

One goal of phytoremediation is to transpire large quantities of ground water with the intention of exerting a hydraulic effect on ground water flow patterns at the site. Phytoremediation can mitigate or even arrest plume migration by preventing untreated contaminants from leaving the site via ground water flow. In accordance with the ROD, the Phytoremediation component was

included as an enhancement to natural attenuation and designed to plant trees within and downgradient of the process area to inhibit movement of ground water contaminants toward the downgradient perimeter of the contamination and to degrade contaminants within the plume. A network of monitoring wells and piezometers across the site allows changes in ground water flow patterns to be established over time. A desired pattern would be a shift in the natural gradient or a decline in the water level that establishes capture. According to the ROD and FSP, the assessment of a Phytoremediation-induced gradient consists of (1) measuring ground water levels semi-annually; (2) plotting hydrographs and potentiometric surface maps; and (3) developing a water balance using precipitation (meteorological) data, irrigation data, soil storage (moisture data), sap flow (e.g. plant uptake), and tree survey data (canopy measurements such as girth and leaf area index [LAI]) to determine plant water usage rates.

Sap flow was measured for individual types of trees, and then empirically applied to the number of trees of that type by incorporating tree girth and LAI data. As presented in Annual reports for 2006, 2007, 2008, and 2009, the overall pumping capacity of the trees has increased over time and resulted in annual plant water usages estimated as 1.7 million gallons, 2.1 million gallons, 2.4 million gallons, and 3.4 million gallons, respectively. Soil storage data (e.g. measurement of moisture content) is not presented in any of the annual reports, and there does not appear to be an accurate account of the input irrigation volume to the trees. Without these data, there is uncertainty associated with these annual water usage estimates which may lead to underestimations of annual water usage. In addition, the water usage estimates do not soley represent the amount of water extracted from the contaminated upper water-bearing zone since these other inputs are unknown. Hydrographs and potentiometeric surface maps when compared over time show that, in times of drought, the phytoremediation strategy exerts some hydraulic influence on the system but, in the rainy season, the trees do not appear to influence ground water movement. Currently, there does not appear to be a Phytoremediation–induced gradient. Nonetheless, sentinel and lower water-bearing zone wells do not indicate contaminant migration based on data collected to date, the plume footprint has shrunk, and significant reductions in contaminant concentrations have occurred within the plume.

Phytoremediation.

Phytoremediation is the use of plants to remove contaminants from the environment either by

concentrating them in the above-ground plant tissue (phytoextraction), biodegradading them into usable energy (phytodegradation), or respiring them into the atmosphere (phytovolatilization). These processes were monitored by measuring transpiration gas, rhizosphere soil, and tree tissue. Transpiration gas sampling activities were conducted on an annual basis to determine if the plants were extracting contaminants from the ground water and/or the surrounding soil and transpiring the contaminants to the atmosphere. Tree coring and tissue sampling were conducted on an annual basis to determine if the plants were concentrating COCs or daughter products from ground water by translocation of the contaminants from the roots into the shoots. Rhizosphere sampling, including soil and soil vapor samples, was conducted annually during the fourth (2009) and fifth (2010) year to evaluate contaminant uptake and degradation in the rhizosphere.

Initial results from preliminary studies conducted for the FS in 2001 (URS 2001b) suggest that established trees located on the site were not phytoextracting COCs at an appreciable rate. Similar results of trace (estimated, J-flagged values) amounts of VOCs were found for a few core samples taken from established trees over the five year period: one sample from 2010 (toluene), two samples from 2009 (EDC, 1,1-dichloroethane, chloromethane, and toluene) and one sample from 2008 (EDC). Data suggest the plants are using contaminated water, but not concentrating those contaminants in the tree tissue. This suggests the trees are degrading the contaminants within the tree tissue.

Transpiration gasses were measured in 2010 for four individual trees. Detectable levels of chloroform and 2-butanone were detected in all samples at similar levels. Methyl chloride was found for only one sample. None of the analytes detected in the transpiration gas samples are likely by-products of TDA or EDC microbial degradation.

The results from rhizosphere sampling were inconclusive for the 2010 monitoring event. They did not specifically demonstrate contaminant biodegradation; however, they indicate increased microbial activity, population size, and respiration that would be associated with a rhizosphere environment relative to one void of a rhizosphere, as was observed during the 2009 monitoring event.

These data suggest that the primary Phytoremediation process is phytodegradation. Data do not show contaminants being stored in the plant tissues nor are they being transpired directly to the atmosphere. Though increased microbial activity in the rhizosphere was confirmed, this process does not appear to be a primary pathway for contaminant degradation. Tree core sampling shows results for site COCs at low concentration, indicating that the plants are uptaking contaminated ground water and biodegrading the contaminants. Based on data results, contaminant bioaccumulation within plant tissue, direct transpiration of contaminants to the atmosphere, and rhizosphere degradation are not primary Phytoremediation pathways for the COCs.

MNA.

In 2006 (baseline) and again in 2010, ground water samples were collected and analyzed for the following MNA parameters: (1) field parameters, such as dissolved oxygen (DO), oxidation/reduction potential (ORP), and ferrous iron and (2) fixed laboratory parameters, such as alternate electron acceptors (nitrate, sulfate, and dissolved iron), degradation gases (methane, ethane, ethene, and carbon dioxide), degradation products (vinyl chloride, chloroethane and toluene), methanogenic conditions (alkalinity), total organic carbon (TOC), and sulfide.

Current site conditions are conducive to continued natural attenuation of the site COCs through reductive dechlorination as reflected by the decrease in plume extent, the presence of daughter products, the lack of downgradient migration, and the reduction in concentrations of parent contaminants. However, closer review of site conditions have identified a few parameters that should be closely monitored as they may be indications of changing site conditions that could influence the continued effectiveness of the MNA component of the remedy.

In 2006, the minimum ground water ORP, DO and sulfate concentrations measured for well MW-201S were -198.2 MV, 0.09 mg/L, and 76.6 mg/L, respectively, indicating the highly reductive capacity of the ground water system and the presence of a sulfate-reducing condition favorable for reductive dechlorination of EDC. However, in 2010, the ground water ORP, DO and sulfate measured in well MW-201S were -172.0 MV, 2.73 mg/L and 7.6 mg/L, respectively, showing a tendency toward more aerobic conditions over time. In fact, most wells show an increasing trend in DO and a more positive ORP compared to the 2006 data. Furthermore,

toluene, which is considered a degradation/daughter product from the incomplete biodegradation of TDA, has raised 6 fold from 1.65 mg/L in 2006 to 8.82 mg/L in 2010 in well MW-201S.

The accumulation of toluene may indicate a change in the microenvironment in the subsurface from a sulfate-reducing environment to a microaerobic environment that supports the incomplete degradation of TDA (Cowen, et al., 1998). In addition, the tendency to aerobic conditions is problematic for reductive dechlorination of EDC or other chlorinated VOCs. The change in the microenvironment may be the result of increased air entry from macropores associated with the tree roots as they open the soil texture and tap into the aquifer.

BIOCHLOR and BIOSCREEN are semi-analytical, Domenico-solution-based, solute transport models that simulate one-dimensional advection, three-dimensional dispersion, linear adsorption and first order decay processes. BIOCHLOR assumes a sequential first-order decay process of reductive dechlorination and BIOSCREEN simulates remediation through natural attenuation of dissolved hydrocarbons using first order decay aerobic and anaerobic reactions as appropriate. BIOCHLOR and BIOSCREEN modeling was conducted in 2006 (Year 1) and again in 2010 (Year 4 ½) as a screen to evaluate the potential for natural attenuation to mitigate the lateral spreading of the contamination. These reports suggest that the model results (2006 and 2010) indicate that there is significant potential for phytoremediation plus natural attenuation processes to mitigate the spread of the contaminant plumes in the upper water-bearing zone for the tracking constituents.

Review of the BIOCHLOR and BIOSCREEN modeling indicates that the steady-state calculations were conservative in that a constant source of contaminants was assumed; however, only a limited number of data points are used to verify the individual models (four for EDC and three for TDA). Despite this, actual site conditions confirm that phytoremediation plus natural attenuation are degrading site contaminants and mitigating plume migration.

Rate constants are used to evaluate constituent degradation. Buscheck and Alcantar (1995) developed a method to apply regression techniques and analytical solutions to estimate the overall attenuation of stable dissolved phase plumes. This method calculates an apparent biodecay rate based on monitoring well concentration data by assuming the plume is at steady state and incorporating information about dispersion and sorption. It does not take into account

transverse dispersivity or volatilization nor does it account for the accumulation of daughter products. As such, the Buscheck and Alcantar method may underestimate the actual degradation rate constant (Burnell et al., 2007) of the contaminant. To date, both the EDC and TDA plumes at the Combustion Inc. site have shrunk and the decay rate constants are decreasing rather than remaining constant or increasing, suggesting that the ROD-required Buscheck and Alcantar method may no longer be applicable. In the December 8 PRP letter (Attachment 7), it is presented that *"..when declining contaminant concentrations are observed in monitor wells, the first-order decay equation may be used to evaluate contaminant concentration versus time for individual wells."*

Burnell et al. (2007) suggest using multi-species solute transport numerical or analytical models such as MT3DMS or BIOCHLOR, respectively to estimate biodegradation rate constants at field sites where biodegradation is occurring (i.e. the plume is shrinking) and daughter products are being formed and subsequently accumulated and/or biodegraded. MT3DMS and MODFLOW couple steady-state, one dimensional advection-dispersion equations with first order chain decay rates for each chemical in the biodegradation pathway of the chemical of concern. Both assume continuous source, are conservative, and should provide reasonable estimates of the rate constants that are more applicable under current field conditions than the simplified Buscheck and Alcantar model originally specified in the ROD. It should be noted that as long as the plume is declining in mass and areal extent, estimation of rate constants may be considered unnecessary and academic with respect to achieving RAO.

A summary of the major findings from each annual monitoring event is provided below.

2006 Annual Monitoring Report (URS 2007a)

Plume Delineation.

All monitoring wells were sampled in April 2006 to serve as the "baseline event." Only 10 out of 18 wells designated as sentinel, perimeter or interior wells were sampled in October 2006 because many of the wells gauged dry (PW-01 through PW-04, PW-08, PW-13, MW-204 through MW-206, and MW-208). See Figure 1 in the FSP for well designation and locations (URS 2005d). Standards for Site COCs (e.g. the two tracking constituents TDA and EDC in

addition to o-/p-toluidine, benzene, toluene, vinyl chloride, chloroethane) as well as screening levels for other volatile organics (e.g. chloroform, carbon tetrachloride and tetrachloroethene) were exceeded in samples obtained from most of the perimeter wells (MW-205, MW-208, MW-213, PW-12, and PW-08) and, as expected, in wells designated as interior wells (PW-01 through PW-06 and MW-201). Contaminant levels were below detections limits (or the cleanup levels) for all sentinel wells and lower water-bearing zone wells.

Plume Migration.

Ground water levels were gauged semi-annually and were presented as hydrographs or potentiometric surface maps for the upper and lower water-bearing zones. The hydrographs presented in the 2006 report for select monitoring wells in the upper water-bearing zone uniformly displayed a general decline in ground water levels when compared to past monitoring events. This decline corresponds to a decline in precipitation over the course of the year compared to previous years. During the October 2006 sampling event, 10 of 18 monitoring wells scheduled to be sampled were dry. It is speculated that these dry conditions combined with an increased transpiration rate of the growing trees depressed the water table to below the well screen. A shift or deflection in the natural gradient would also be indicative of phytoremediation-induced hydraulic gradient; however, 2006 is the base year for this comparison.

Meteorological data, irrigation and sap flow measurements were used to determine water usage rates for individual tree types and extrapolated to the entire canopy. The report indicates that each tree used 4.7 gallons per day, for a total usage of 1.7 million gallons for the year for the 997 trees. It was noted in the report that the precipitation totals did not include irrigation totals and that the rain gauge became clogged and was malfunctioning for some unknown period of time. These omissions would have resulted in an underestimation of the total water usage by the plants. Once the precipitation and irrigation volumes are accounted for, the balance can be provided in terms of acre feet of water used and expected drop in water table calculated at the given usage rate (the equivalent to a pumping withdrawal).

2007 Annual Report (URS 2008)

Plume Delineation.

Of the Process Area monitoring wells, only 9 out of 18 wells were sampled in April 2007 (half gauged dry) whereas all 18 wells were sampled in October 2007. Standards for Site COCs (including TDA, EDC in addition to o-/p-toluidine, 1,1-dichloroethene, 1,2-dichloroethane, benzene, toluene) were exceeded in samples from wells MW-201, MW-203, MW-208S, MW-213S, PW-05, PW-06, PW-12, and PW-13; however, the trend in these wells was declining compared to 2006 levels. Contaminant levels were below detections limits (or the cleanup levels) for all sentinel wells.

Plume Migration.

Water level measurements were made in 9 of the 18 monitoring wells in April. According to the potentiometric surface map, 13 of the 18 wells in October 2007 were gauged; however, all wells were sampled during the October sampling event. The hydrographs presented in the 2007 report for select monitoring wells in the upper water-bearing zone uniformly displayed a significant increase in ground water levels in April compared to October. These data imply that the trees may not provide a phytoremeditaion-induced hydraulic gradient in times of ample precipitation but do during drought conditions. Despite the increased plant canopy and plant growth, water usage was estimated at only 2.1 million gallons per year compared to 1.7 million gallons the previous year. A subtle shift in the natural gradient of the upper water-bearing zone was observed when comparing potentiometric surface maps from April 2006 to April 2007. This would indicate a slight phytoremeditaion-induced hydraulic gradient influence, but is inconclusive regarding containment. No discernible shift in ground water trajectories was noted when comparing the gradient from October 2006 to October 2007.

Of the Process Area monitoring wells, 18 were sampled in October 2007. Standards for Site COCs (including TDA, EDC in addition to, 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, benzene, chloroethane, toluene, trans-1,2-dichloroethene, vinyl chloride, o-/p-toluidine) were exceeded in samples in wells MW-201, MW-203,MW-204S, MW-205S MW-206S, MW-208S, MW-213S, PW-01, PW-02, PW-03, PW-04, PW-05, PW-06, PW-08, and PW-12. Contaminant levels were below detections limits (or the cleanup levels) for all sentinel wells with the exception of monitoring well MW-206S at 0.00588 mg/L EDC.

2008 Annual Report (URS 2009)

Plume Delineation.

Twenty of the Process Area monitoring wells were sampled in April 2008. Standards for Site COCs (including TDA and EDC) were exceeded in samples from wells MW-201, MW-203, MW-204S, MW-205S, MW-208S, MW-213S, PW-01, PW-02, PW-03, PW-04, PW-05, PW-06, PW-08, PW-12, and PW-13. Contaminant levels were below detections limits (or the cleanup levels) for all sentinel wells. Nineteen of the twenty Process Area monitoring wells were sampled in October 2008. Standards for Site COCs (including TDA and EDC) were exceeded in samples from wells MW-201, MW-203, MW-204S, MW-205S, MW-208S, MW-213S, PW-01, PW-02, PW-03, PW-04, PW-05, PW-06, PW-08, and PW-12. Contaminant levels were below detections limits (or the cleanup levels) for all sentinel wells. Overall, contaminant levels had declined compared to 2006 levels, especially TDA concentrations in well MW-201.

Plume Migration.

All twenty monitoring wells were gauged and sampled in April 2008, and 19 were gauged and sampled in October. As in previous years, the hydrographs presented in the 2008 report for select monitoring wells in the upper water-bearing zone show a general increase in ground water levels in April compared to October. There was no shift in the natural gradient between October 2007 and April 2008, whereas a subtle shift in the gradient was detected between April 2008 and the drier season in October 2008. Transpiration measurements accounted for an annual plant water use of 2.4 million gallons despite the fact that the overall pumping capacity of the trees was reduced by 33 percent in September due to Hurricane Gustav.

2009 Annual Report (URS 2010a)

Plume Delineation.

Twenty of the Process Area monitoring wells were sampled in April 2009 and 19 were sampled in October. Standards for Site COCs (including TDA, EDC) were exceeded in samples from wells MW-201, MW-203, MW-204S, MW-205S, MW-206S, MW-208S, MW-213S, PW-01,

PW-01S, PW-02, PW-03, PW-04, PW-05, PW-06, PW-08, and PW-12 for both events. Notwithstanding the exceedance of standards, the tracking constituents had met and exceeded the 10 % reduction goal set forth by the ROD. Unlike previous monitoring events, EDC levels were above the detection limit (and cleanup level) for the sentinel well MW-206S at 0.00518 mg/L in April and at 0.00693 mg/L in October. The lateral extent of both plumes had shrunk considerably when compared to 2006 and overall concentrations were decreasing in all wells for most contaminants.

Plume Migration.

Monitoring wells were gauged semi-annually during 2009, and samples were collected from 20 Process Area monitoring wells in April and 19 monitoring wells in October. The hydrographs presented in the 2009 report mostly display seasonal variations in water levels as in 2006. Spikes in water levels are typically associated with rainfall events. The fall and winter of 2009 were unseasonably rainy and wet. Likewise, an overall shift in the natural gradient has occurred over the past four years with the subtle differences most likely attributed to the seasonal variability rather than a phytoremediation-induced hydraulic gradient. Transpiration measurements in 2009 accounted for an annual plant water use of 3.4 million gallons, a 41% increase over the previous year.

2010 Annual Report (URS 2010b)

Plume Delineation.

Twenty of the Process Area monitoring wells were sampled in April 2010. The geometric mean chemical concentrations of the two tracking constituents, EDC and TDA, have decreased over 10% during the first five years of the remedy using the April 2006 sampling event as the baseline for measurement, thereby demonstrating acceptable remedy performance. This average percentage decrease was calculated using those monitoring wells which were impacted (concentrations greater than ROD cleanup levels) by the tracking constituents. Despite the fact that overall most COC levels have decreased with time and the plume has shrunk laterally, wells MW-201, MW-203, MW-204S, MW-205S, MW-213S, PW-01, PW-01S, PW-02, PW-03, PW-04, PW-05, PW-06, PW-08, and PW-12 were still in exceedance of the Standards for all Site

COCs including TDA and EDC in April 2010. Contaminant levels were below detections limits (or the cleanup levels) for all sentinel wells, including well MW-206S, and all lower water-bearing zone wells. Based on these results, the remedy is effective at reducing contaminant concentrations at a rate sufficient to achieve RAOs.

Plume Migration.

All monitoring wells were gauged in April of 2010, and samples were collected from 38 wells both in the Pond and Process Areas. As in the 2009 report, the hydrographs and potentiometric surface maps presented in the 2010 report reflect seasonal variations in water levels, not necessarily a phytoremediation-induced hydraulic gradient, with the exception of wells that bail dry from time to time. Despite the fact that the overall pumping capacity of the trees has increased over time, the lack of a fully developed water balance does not allow for estimates of the recharge to the upper water-bearing zone. Overall, the data collected are inconclusive as to whether or not a phytoremediation-induced hydraulic gradient exists.

6.5 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENT REVIEW

As part of this five-year review, ARARs identified previously for this site were reviewed to determine if any newly promulgated or modified requirements of federal and state environmental laws have significantly changed the protectiveness of the remedies implemented at the Site. ARARs for this Site were originally identified in the ROD for the Site (EPA 2004a). The ARARs reviewed were those included in the site's decision documents as they apply to the selected Alternative 3 (Phytoremediation and Monitored Natural Attenuation).

The ARARs identified by the ROD for the Site include chemical-, action- and location-specific requirements. These ARARs are listed in Table 3. Many of the ARARs identified are no longer applicable since those ARARs applied to specific activities associated with the remedial action that are complete or no longer occurring at the Site. Therefore, as a practical matter, they are no longer applicable to site remediation. However, should additional construction activities occur, these ARARs may be applicable.

6.5.1 Chemical-Specific ARARs

Chemical-specific ARARs are usually health or risk-based numerical values or methodologies used to determine acceptable concentrations of chemicals that may be found in or discharged to the environment. The chemical-specific ARARs specified in the ROD for the Combustion, Inc. Superfund Site (Combustion) are presented in Table 3, and those relevant to the remedial action are summarized below, along with relevant changes to the ARARs since the ROD was issued.

The cleanup levels for contaminants in the ground water in the vicinity of the Process Area provide guidance for the cessation of remedial activities. Through an EPA/LDEQ enforcement agreement dated February 9, 1987, the State of Louisiana, through the LDEQ, was assigned as the lead agency on all site activities. In the ROD, the upper water-bearing zone is identified as a class 2B zone, which is interpreted to be a potential drinking water source. Based on this, the MCLs were listed as an ARAR in the ROD, while the Louisiana Risk Evaluation/Corrective Action Program (RECAP) (EPA 2004a) was listed as a to-be-considered standard.

RECAP provides for the calculation of cleanup levels within a plume based on ground water use, a designated dilution factor, and the established point of exposure. Further clarification provided in the December 13 PRP letter (Attachment 8), indicates that RECAP establishes that the MCLs, if available, will be met at the point of exposure (POE). For this site, the POE is designated as the site's southern boundary which is located approximately 425 feet downgradient of the sentinel and downgradient monitoring wells. Site-specific cleanup levels were developed using. RECAP which incorporates the MCLs as the screening standard, if one is available, and develops a risk-based standard if an MCL is not available. The ROD cleanup levels establish concentrations that are expected to be protective of the downgradient POE such that exposure would not exceed the established MCL or risk-based cleanup level.

The ROD cleanup levels are presented in Table 4 along with current MCLs. Site COCs which differ from the current MCL are shaded. Current MCLs differ for: 1,1-dichloroethene (MCL higher than the cleanup level), cis-1,2-dichloroethene (MCL lower than the cleanup level), and methylene chloride (MCL higher than the cleanup level). Although the cleanup level for cis-1,2-dichloroethene (0.518 mg/L) is significantly higher than the MCL (0.07 mg/L), the reported

concentrations for cis-1,2-dichloroethene are below the MCL, with the highest reported concentration being 0.0258 mg/L. In addition, no cis 1,2-dichloroethane concentrations have been reported in either the sentinel or lower water-bearing zone wells.

A comparison of standards employed in the human health risk assessment (HHRA) for ground water to current standards was performed (WCIA 1997). The selection of contaminants for the HHRA was based on EPA Region III risk-based concentrations (RBCs), the standard at the time (WCC 1997). Current guidance recommends the use of federal Risk Screening Levels (RSLs). A comparison of the 1995 RBCs to the May 2010 RSLs indicates that most of the values have changed. The most significant changes were for arsenic, ethylbenzene, total xylenes, and naphthalene, none of which are Site COCs. As a consequence, the EPA risk assessor reviewed the RI data and the following are the results of this review:

- Xylene data from the RI do not exceed the MCL (10 mg/l). This includes both detected concentrations and adjusted detection limits due to dilution/matrix interference. Xylene is currently sampled and reported annually. Data from the April 2009 report show the maximum detected concentration to be 0.352 mg/l. This is not above the MCL. No updated risk assessment is necessary.
- Ethylbenzene data from the RI for detected concentrations do not exceed the MCL (0.7 mg/l). Though there were detection limits well above the MCL, this was due to dilution/matrix interference due to high concentrations of toluene. Ethylbenzene is currently sampled and reported annually. Data from the April 2009 report show the maximum detected concentration to be 0.0291 mg/l. This is not above the MCL. No updated risk assessment is necessary.
- Naphthalene has a Drinking Water Equivalent Concentration (DWEL) of 700 ug/l that is based upon the Reference Dose (RfD) of 0.02 mg/kg-day and a Health Reference Level (HRL) of 140 ug/l that assumes that 20% of an individual's total exposure was attributable to drinking water. The detected levels of naphthalene ranged from 1 ug/l to 72 ug/l. The maximum detected level of naphthalene of 72 ug/l did not exceed the DWEL and HRL levels of 700 ug/l and 140 ug/l, respectively. No updated risk assessment is necessary.
- For arsenic, the background was as high as 4 ug/l. None of the RI data exceeded the previous MCL of 50 ug/l. Of the RI data, only 2 wells exceed the current MCL of 10 ug/l (12.2, 15.3, 19.2, 19.4). ProUCL 4.0 was used to determine a recommended statistical approach and to calculate an upper confidence limit (UCL) of the arsenic levels. The recommended statistical approach is use a 95% Approximate Gamma UCL with an estimated UCL of 8.35 ug/l. The UCL of 8.35 is not above the current MCL of 10 ug/l. No updated risk assessment is necessary.

In addition to the change in screening level guidance, several other HHRA methodologies have changed since the Site HHRA was issued in 1997. Namely, the methodologies for dermal

toxicity adaptation were changed by EPA guidance in 2004 (EPA 2004b). The dermal toxicological values used in the HHRA are incorrect under current methodologies. The methodologies employed in the calculation of the inhalation pathway also changed (EPA 2009); none of the inhalation toxicological values used in the HHRA are correct under current methodologies.

The primary driver in the HHRA for ground water was ingestion; so the changes to the dermal and inhalation pathways are not significant. However, the HHRA did not evaluate volatilization from ground water to indoor air. Generally, the indoor air inhalation pathway was considered insignificant in 1997 and only became of concern in recent years for sites involving volatile contaminants in ground water, in particular in areas that have or could have future residential development.

In a response dated December 8, 2010, the PRPs presented a screening evaluation of the indoor air pathway (Attachment 7). The following is their response.

> *Based on current methodology (RECAP, 2003), the non-industrial (residential) indoor air pathway is not the risk driver for any COC. Additionally, the PRPs, through the Combustion, Inc. Site Remediation Group, LLC, own the former Process Area and an additional 30 acres downgradient. The site employs no full-time labor force so there are no occupied buildings on site. The Process Area is locked and gated and is therefore not accessible to the surrounding community. Conveyance notices restrict future site development, if any, to commercial or industrial development.*
>
> *The PRPs have updated the calculation of Cleanup Levels consistent with GW2 RECAP 2003 methods based on the 2010 Q2 and 2010 Q4 groundwater data sets. Form 15 Screening Option Submittal for Groundwater and Form 16 Management Option 1 (MO-1) Submittal for Groundwater are provided in Attachment 2. RECAP MO-1 calculations include the option to evaluate RECAP standards GWesni (standard for groundwater beneath an enclosed structure in a non-industrial setting) and GWairni (standard for volatile emissions from groundwater to the ambient air in a non-industrial setting). The limiting MO-1 RECAP standard for a COC is the minimum of the following calculated MO-1 standards for that COC: final GW2, GWesni, GWairni, and COC solubility. The ROD Cleanup Level for each COC was then assigned as the limiting MO-1 RECAP standard for the COC.*

Comparison of 2010 Q4 Concentrations to Residential (Non-Industrial) Indoor Air Quality Standards (GWesni)

2010 Q4 MO-1 RECAP Parameter List	GWesni (mg/L)	2010 Q4 Concentration (mg/L)	CC Exceeds GWesni?
2,4/2,6-Toluenediamine	NA	2.8E+01	No
o and/or p-Toluidine	NA	4.1E-01	No
Trichloroethane,1,1,2-	8.4E+00	3.6E-02	No
Dichloroethane,1,1-	1.4E+02	5.7E+00	No
Dichloroethene,1,1-	1.8E+01	1.8E-01	No
Dichloroethane,1,2-	3.6E+00	2.1E+00	No
Benzene	2.9E+00	6.2E-02	No
Chloroethane (ethylchloride)	5.1E+03	1.2E-02	No
Toluene	8.9E+01	2.0E+00	No
Vinyl chloride	2.0E-01	2.2E-01	Yes

With the exception of vinyl chloride at PW-01S, current site groundwater concentrations meet RECAP non-industrial indoor air standards, GWesni. Vinyl chloride concentrations at PW-01 meet the GWesni standard. PW-01S is a sister well to PW-01. The concentration trend of vinyl chloride in PW-01S is declining.

In accordance with the ROD, during the five year review, only contaminants present in the ground water in the process area will be evaluated using the RECAP framework to determine if acceptable concentrations of each constituent have been achieved by the remedy. The RECAP model was last updated in 2003 (LDEQ 2003). In the 2010 annual report, the model is run for all pond area ground water detected concentrations; negating impacts of revised screening values. The 2003 RECAP model incorporates consideration of the indoor air pathway. Therefore, use of this model compensates for the significant changes in guidance and toxicological values that have occurred since the HHRA was issued. However, it should be noted that the annual report does not utilize the RECAP model for the process area as required by the ROD.

In a response dated December 8, 2010, the PRPs presented an update of the ROD cleanup levels using current RECAP procedures (Attachment 7). The following is their response.

The Cleanup Levels for the upper water-bearing zone groundwater were calculated using RECAP (LDEQ 2000). RECAP was updated in 2003; however, the calculation methods remain essentially the same. As discussed in the Action Item 10, the PRPs have utilized current RECAP methodologies (2003) to update the Cleanup Levels using RECAP Forms 15 and 16 (see Attachment 2).

As the COCs continue to breakdown at the site causing a continual shift in the COC profile, the additivity factors applied to the non-carcinogenic COCs require re-evaluation. The PRPs will recalculate and resubmit RECAP Forms 15 and 16 with each five-year review to

evaluate COC groundwater concentrations against updated site-specific Cleanup Levels calculated using current RECAP methodologies. These updated Cleanup Levels have been compared to the 2010 Q2 (April) and 2010 Q4 (October) groundwater concentration data sets as shown in Tables 2 and 3, respectively. A comparison of ROD Cleanup Levels to the 2010 Q4 updated Cleanup Levels is tabulated below:

Comparison of ROD Cleanup Levels to 2010 Q4 updated Cleanup Levels

2010 Q4 MO-1 RECAP Parameter List	***ROD Cleanup Level (mg/L)***	***2010 Q4 MO-1 RECAP Standard (mg/L)***
2,4/2,6-Toluenediamine	*1.0E-02*	*1.0E-02*
o and/or p-Toluidine	*1.0E-02*	*1.0E-02*
Trichloroethane,1,1,2-	*5.0E-03*	*3.7E-02*
Dichloroethane,1,1-	*7.5E-01*	*6.0E+00*
Dichloroethene,1,1-	*6.0E-03*	*5.2E-02*
Dichloroethane,1,2-	*5.0E-03*	*3.7E-02*
Benzene	*5.0E-03*	*3.7E-02*
Chloroethane (ethylchloride)	*2.8E-02*	*2.8E-02*
Toluene	*1.0E+00*	*7.4E+00*
Vinyl chloride	*2.0E-03*	*3.7E-02*

As presented by the supplemental information provided by the PRPs, the cleanup levels listed in the ROD were updated for those contaminants that exceeded the RECAP screening level. Where MCLs exist, RECAP incorporates those as screening levels, and where absent, RECAP uses a risk-based screening level. The table above only lists those site COCs that exceeded their corresponding RECAP screening level (MCL incorporated) and were updated using RECAP. As shown in the table, the updated 2010 cleanup levels are not lower than the ROD cleanup levels indicating that the ROD cleanup levels remain conservative, continue to be appropriate, and are protective. [It should be noted that cis 1,2-dichloroethene was not updated as current site concentrations do not exceed the RECAP screening level of 0.07 mg/L, which is the current MCL.]

No other chemical-specific ARARs were identified during this review.

6.5.2 Location-Specific ARARs

Location-specific ARARs restrict actions or contaminant concentrations in certain environmentally sensitive areas. Examples of areas regulated under various Federal regulations include floodplains, wetlands, and locations where endangered species or historically significant

cultural resources are present. The ROD did not identify any location-specific ARAR pertaining to the remedial action selected and implemented at the Combustion Site, and no new or additional location-specific ARARs were identified during this review.

6.5.3 Action-Specific ARARs

Action-specific ARARs are usually technology- or activity-based requirements or limitations on actions or conditions involving specific substances. These requirements are triggered by the particular remedial activities that are selected to accomplish the remedy. No changes in action specific ARARs were identified during this review

6.6 SITE INSPECTION

A site inspection was conducted on May 19 and 20, 2010, to assess the condition of the Combustion Superfund Site and the measures employed to protect human health and the environment from the contaminants still present at the Site. On May 19, 2010, Ms. Katrina Higgins-Coltrain from the EPA; Mr. Todd Thibodeaux from the LDEQ; and Ms. Cristina Radu and Ms. Lane Andress from EA walked around the neighborhood immediately next to the site and did door-to-door interviews with the local residents. Responses from local residents are included as site survey forms in Attachment 3. On May 20, 2010, the site inspection was conducted. Attendees included:

- Ms. Higgins-Coltrain, EPA remedial project manager
- Mr. Thibodeaux, LDEQ project manager
- Mr. Michael Pisani, MP&A, the PRP Project Manager
- Mr. Carlton Todd, MP&A, the PRP Senior Engineer
- Mr. Dwayne Johnson Liskow & Lewis, attorney
- Mr. Bob Holden, Liskow & Lewis, attoreny
- Ms. Kristi Trail, Shell Oil Company
- Mr. Randy Harris, arborist with Farris Construction, PRP contractor
- Ms. Cheryl Warren, URS project manager

- Mr. Bill Hurdle, URS senior engineer
- Mr. David Tsao, BP oil company, phytoremediation technical specialist

Ms. Cristina Radu and Ms. Lane Andress, EA, provided support to EPA for the Site visit. Elizabeth Holden, intern with Liskow and Lewis, observed the Site visit. The site inspection checklist is included in Attachment 2, site survey forms are provided in Attachment 3, and a photographic log of the inspection is included in Attachment 4.

No evidence of contamination was visible at the Site. The Site's general appearance was good, and the Site appeared to be well maintained. The inspection team observed the locations of the monitoring wells, the tree stands, tree monitoring equipment and storage area for purged monitoring wells pending proper disposal, and the perimeter of the facility, including the fences, warning signs, and locked gates.

Monitoring wells were in good condition, clearly marked and were equipped with appropriate locking devices. The tree stands and the vegetation of the Site do not show signs of stress.

The pathways and dirt roads within the facility are in good condition. There is a chain link fence that surrounds both the Process and Pond Areas of the site. Locked gated entryways are the only access points into the Site. Signs are located every few hundred feet along the fence perimeter and on gated entry ways. The signs legibly identify this facility as an active Superfund Site and contain emergency contact numbers.

Evidence of ponding water was seen in the southwest portion of the Process Area. The source of ponded water is from a man made drainage that flows from a mobile-home park on the other side of Burgess Road from the Combustion Site. At the time of the site visit the water was observed to be flowing and water had a strong sewage odor. This water is not currently sampled by the PRP. See photographic log in Attachment 4.

6.7 SITE INTERVIEWS

In accordance with the community involvement requirements of the FYR process, key

individuals to be surveyed were identified by the EPA. Contacted individuals included a LDEQ regulator, the PRP Project Manager, the Site contractor, the local residents, and a city official. Completed survey forms for the following individuals are included in Attachment 3:

- Mr. Todd Thibodeaux, LDEQ Environmental Scientist, also the LDEQ Project Manager
- Mr. Mike Pisani, PRP Project Manager
- Ms. Cheryl Warren, Project Manager for URS, the PRP remediation contractor
- Mr. and Mrs. [redacted], local resident
- Mr. [redacted], local resident
- Ms. [redacted], local resident
- Mr. [redacted]s, local resident
- Honorable James E. Durbin, Mayor, City of Denham Springs

The PRP Project Manager and the PRP Contractor responses were positive indicating the project was proceeding well.

Both the PRP Project Manager and the PRP Contractor mentioned an incident requiring emergency responses from local authorities. This incident involved a report of odor and an observation of discolored water in the surface water in the drainage canal adjacent to the former Pond Area. The report was made by a Livingston Parish contractor removing debris from the drainage canal. Livingston Parish-Homeland Security and OEP as well as LDEQ personnel responded to this report. In follow-up with LDEQ personnel, no significant observations were provided and there are no records in the LDEQ official file for the Combustion, Inc. Site concerning this report. Site Project Management representatives also inspected the site after receiving notice from the LDEQ. Sampling records for the drainage ditch were reviewed and contaminants were within the risk-based limits at the location of the incident. No further action was directed by LDEQ.

The PRP Contractor recommended that because the tree stands are well established and the ground water concentrations are decreasing, the emphasis should be the evaluation of concentrations of site-related COCs in the ground water and that the extensive monitoring of the trees should be less important during this next five year review period**.**

Overall, the local residents surveyed had positive responses regarding the Site. Mr. and Mrs. [redacted] whose house is [redacted] the street from the former Process Area, had a

concern about people wearing white suits while working at the Site and they wanted to know if they were in any danger. Mr. Thibodeaux and Ms. Higgins-Coltrain explained that there was no danger to them, that it was to protect the workers from getting potentially contaminated ground water on their skin. Ms. [redacted] stated that cleaning up the site was a good thing but she thought it was a waste of money to plant so many trees just to make it look good. Mr. Thibodeaux and Ms. Higgins-Coltrain explained that the trees were part of the remediation and that they were cleaning up the contamination.

No other issues were brought up by the stakeholders.

7.0 TECHNICAL ASSESSMENT

The conclusions presented in this section support the determination that the selected remedy for the Site is currently protective of human health and the environment. EPA Guidance indicates that to assess the protectiveness of a remedy, three questions (Questions A, B, and C) shall be answered.

7.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

- **RA Performance -** The remedy has performed well to date; the increase of concentrations of some Site COCs that are the result of biodegradation and changing oxide-reduction conditions should continue to be evaluated to track the remedy's progress towards meeting the RAOs established in the ROD.
  - Ground water concentrations for the two tracking contaminants, 1,2-dichloroethane and 2,4/4,6-toluenediamine, met the 10% reduction in geometric mean concentration criteria specified in the ROD. Because this criteria has been met, implementation of the contingency remedy, Hot-spot treatment is not necessary.
  - There has been no migration of site contaminants downgradient or vertically into the lower water-bearing zone.
  - Despite having been hit by 3 hurricanes, the Phytoremediation stands of trees are robust and healthy. Phytodegradation by the trees has been documented through the detection of contaminants of concern in tree core samples and active ground water usage.
  - MNA parameters including daughter products and supporting biochemical markers currently support an environment suitable for continued contaminant degradation.
  - In conjunction with mass reduction, the plume extent has shrunk for some COCs while others have remained stable.

- Pond area ground water contaminants remain below screening numbers in both Zone 1 and Zone 2.
- The ICs remain in place and are enforced by the LDEQ, in conjunction with the PRP group.

- **Cost of System and O&M**—annual O&M and monitoring costs were not available for review; significant capital costs necessary to repair damage from multiple hurricanes that affected the phytoremediation component at the Site have been covered by the PRPs.

- **Opportunities for Optimization—**

  - The ability of robust plant stands to extract contaminated water and degrade the contaminants through phytodegradation has been demonstrated. Therefore, a review of the tree stand locations and density could identify additional areas and potential planting locations for additional trees within the plume. These potential locations would expand the Phytoremediation impact on contaminant concentrations as well as plume migration and reduction.
  - Current site conditions show the contaminant plumes to be shrinking. The use and calculation of decay rate constants as presented by Buscheck and Alcantar may no longer provide useful information about the progression of plume decay. As site contaminants degrade and daughter products become more prevalent, applicability and the use of decay rate constants, or the use of other models/calculations, as they relate to parent and daughter products should be reviewed These calculations may be replaced with a more applicable methodology of first-order decay equations and associated trend graphs. Should the plume shrinkage stall and become stable, then the use of the Buscheck and Alcantar decay rate constant should be calculated to track plume decay progress.
  - A number of parameters that have been measured or calculated to date may be relaxed or eliminated altogether now that the positive effects of the remedy can be measured by direct or strongly implicit observations. Rhizosphere sampling (soil gas and microbial), transpiration sampling, and tree stand health indicators should be considered for elimination. Rhizosphere sampling and transpiration sampling results do not indicate that these are significant areas of contaminant degradation and provided limited to no useful information. Measurement of tree stand health indicators are no longer necessary as a reportable element in the annual reports since the tree stands are established, healthy, and robust.
  - As long as the plume is stable to declining, the plant stand remains healthy and robust, the plant stand continues to uptake ground water, and the mass of contaminants as measured by concentration trends is declining, the remedy is achieving RAOs and will meet ROD cleanup levels.

- **Early Indicators of Potential Issues**—
  - Several biochemical parameters sampled to support MNA, may indicate a change in the site conditions that could influence the continued effectiveness of the MNA component of the remedy. The parameters appear to show that the plume is slowly becoming aerobic versus the desired anaerobic. Plume characteristics should be monitored closely, and should the combined Phytoremediation/MNA remedy become ineffective, then the contingency remedy should be reconsidered.
  - Rate constants are declining, and appear to indicate that contaminant destruction is slowing. However, there is uncertainty in the applicability of the Buscheck and Alcantar method.
  - The accumulation of daughter products, especially toluene as a result of TDA destruction, may prove problematic. Toluene should degrade aerobically (much quicker provided the proper microbial consortia) and anaerobically, so accumulation coupled by slow degradation may indicate a change is site conditions that could influence the continued effectiveness of the MNA component of the remedy.

- **Implementation of ICs and Other Measures**—Conveyance notifications restricting land and ground water use were filed in 2006. Land use for both the Pond area and the process area is restricted to industrial/commercial use and the ground water in both areas is restricted from any use. The fence around both areas of the Site is intact, complete with locked gates, and thus is adequate to restrict access to the areas where the remedy is in place. Warning signs regarding the presence of a Superfund Site with emergency contact numbers are visible and legible.

7.2 QUESTION B: ARE THE ASSUMPTIONS USED AT THE TIME OF REMEDY SELECTION STILL VALID?

- **Changes in Exposure Pathways**—The HHRA did not evaluate volatilization from ground water to indoor air. This pathway only became of concern in recent years for sites involving volatile contaminants in ground water, in particular in areas that have or could have future residential development, such as the Process Area. No other changes in the Site conditions that affect exposure pathways were identified as part of the five-year review. This is due to several factors: primarily, there are no current or planned changes in land use, and secondly, no new contaminants or sources were identified as part of this FYR.

- **Changes in Standards, Newly Promulgated Standards, and To-Be-Considered**—No newly promulgated ground water standards were identified; however, the MCLs for Site COCs currently differ from the cleanup levels established in the ROD: 1,1-dichloroethene (MCL higher than the cleanup level), cis-1,2-dichloroethene (MCL lower than the cleanup level), and methylene chloride (MCL higher than the cleanup level).

  RECAP was identified as a to-be-considered standard and was used to develop plume cleanup levels. RECAP was revised in 2003 to update the process used for ground water pathway evaluation to include an indoor air exposure assessment.

Although the cleanup level for cis-1,2-dichloroethene (0.518 mg/L) is significantly higher than the MCL (0.07 mg/L), the reported concentrations for cis-1,2-dichloroethene are below the MCL, with the highest reported concentration being 0.0258 mg/L.

- **Changes in Toxicity and Other Contaminant Characteristics**—None of the inhalation toxicological values used in the HHRA are correct under current methodologies. Also, risk methodologies have changed since the risk assessment was performed. Although the expected land use in the process area was identified as residential, the indoor air exposure pathway is not considered complete because there are currently no homes on the property, there are no occupied industrial buildings on the property, the ICs restrict land use to industrial/commercial use, and the PRPs owns the property and maintain control over land use.

  In a response dated December 8, 2010, the PRPs presented a screening evaluation of the indoor air pathway (Attachment 7). Based on current methodology from RECAP (2003), the non-industrial (residential) indoor air pathway is not the risk driver for any COC. Current site ground water concentrations meet RECAP non-industrial indoor air standard except for vinyl chloride.

- **Changes in Land Use**—There have been no changes in land use that bear on the protectiveness of the selected remedies.

- **New Contaminants and/or Contaminant Sources**—Although not considered new contaminants or sources, the daughter products resulting from parent contaminant degradation are increasing in concentration. These daughter products are currently monitored; however, more focus on tracking these contaminants along with the parent contaminants should be included in future reports.

- **Expected Progress Toward Meeting RA Objectives—**There is an overall downward trend in ground water contaminant concentrations at the site. The established RAOs remain valid. The selected remedy is currently functioning as intended. Several biochemical parameters sampled to support MNA, may indicate a change in the site conditions that could influence the continued effectiveness of the MNA component of the remedy. Plume characteristics should be monitored closely, and should the combined Phytoremediation/MNA remedy become ineffective, then the contingency remedy should be reconsidered.

7.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?

No other information has been identified that calls into question the current protectiveness of the remedy.

7.4 TECHNICAL ASSESSMENT SUMMARY

According to documents and data reviewed, the site inspection, interviews, and Site data, the remedy for the Management of Migration OU at the Site is currently operating as designed.

8.0 INSTITUTIONAL CONTROLS

ICs are generally defined as non-engineered instruments such as administrative and legal tools that do not involve construction or physically changing the Site and that help minimize the potential for human exposure to contamination and/or protect the integrity of a remedy by limiting land and/or resource use (EPA 2005). ICs can be used for many reasons including restriction of Site use, modifying behavior, and providing information to individuals (EPA 2000). ICs may include easements, covenants, restrictions or other conditions on deeds, and/or ground water and/or land use restriction documents (EPA 2001). The following sections describe the ICs required at the Site, the potential effect of future land use plans on ICs, and any plans for changes to Site contamination status.

8.1 TYPES OF ICS IN PLACE AT THE SITE

Thirteen conveyance notices are currently in place at the Site. The conveyance notices for the Pond Area restrict land use to industrial/commercial purposes and restrict the use of ground water for any purpose. The conveyance notices for the Process Area restrict the use of ground water and have also restricted the land use to industrial/commercial despite the fact that the soil meets residential land use standards. These notices were recorded on June 14, 2006, and are included as Attachment 6 to this FYR report. These ICs are enforced and monitored by LDEQ in accordance-with La. Rev. Stat. Ann. §30:2039 (2000) and La. Admin. Code tit. 33 Part 5 §3525

(2002). In addition, these ICs are enforced by the PRPs through active site monitoring and continued operation and maintenance work.

8.2 EFFECT OF FUTURE LAND USE PLANS ON INSTITUTIONAL CONTROLS

No future land uses have been established or are anticipated for the Site that would require an adjustment to the ICs currently being required to be implemented.

8.3 PLANS FOR CHANGES TO SITE CONTAMINATION STATUS

No changes to the status of the contamination at the Site are presently anticipated.

9.0 ISSUES

This section describes issues associated with the Site that were identified during the First Five-year review:

1. Ground water concentrations for the two tracking contaminants, EDC and TDA, met the 10% reduction in geometric mean concentration criteria specified in the ROD.

2. No vertical migration of COCs into the lower water-bearing zone has been demonstrated for the site.

3. The trends for the tracking constituents, TDA and EDC, are not similar for all COCs.

4. Daughter compounds, such as toluene, are increasing above the cleanup levels due to degradation.

5. Detection limits for some compounds are at or above the cleanup levels.

6. Establishment of a phytoremediation-induced gradient was inconclusive.

7. Several biochemical parameters sampled to support MNA, may indicate a change in the site conditions that could influence the continued effectiveness of the MNA component of the remedy.

8. Several parameters measured in support of phytoremeditation provided limited useful information to demonstrate contaminant biodegradation.

9. The number of data points used to verify BIOCHLOR and BIOSCREEN modeling is limited.

10. To date, both the EDC and TDA plumes have shrunk and the decay rate constants are decreasing rather than staying constant or increasing, suggesting that the ROD-required Buscheck and Alcantar method may no longer be applicable.

11. The cleanup level for *cis* 1,2-dichloroethene is set at 0.518 mg/L, which is significantly higher than the Maximum Contaminant Level (MCL) of 0.07 mg/L.

12. The human health risk assessment did not evaluate volatilization from ground water to indoor air for the Process Area.

13. Human health risk assessment methodologies for dermal and inhalation toxicity have changed since the assessment was performed at the site.

10.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

This section describes the recommendations and follow-up actions associated with the Site that were identified during the First FYR. Table 5 summarizes the recommendations and follow-up actions for the Site. The PRP group was given an opportunity to review and comment on the draft five-year review. The PRP responses have been included as attachments and addressed throughout the document as appropriate. When the report is finalized, a copy will be sent to the PRP for their records. In addition, the cover letter will make note of the recommendations made in the report as well as the expected schedule for completion. The EPA and LDEQ will work closely with the PRP to address the recommendations within the expected completion schedule.

11.0 PROTECTIVENESS STATEMENT

Based on the information available during the first FYR, the selected remedy for the Combustion Inc. site is currently performing as intended. The remedy is considered protective because ICs are in place; therefore, there are no current or potential exposures. The recommendations and follow-up actions identified in this FYR process should be addressed or continued for long-term remedy protectiveness of human health and the environment until RAOs are met.

12.0 NEXT REVIEW

The Site requires ongoing FYRs. The next review will be conducted within the next five years, but no later than February 2016.

Figures

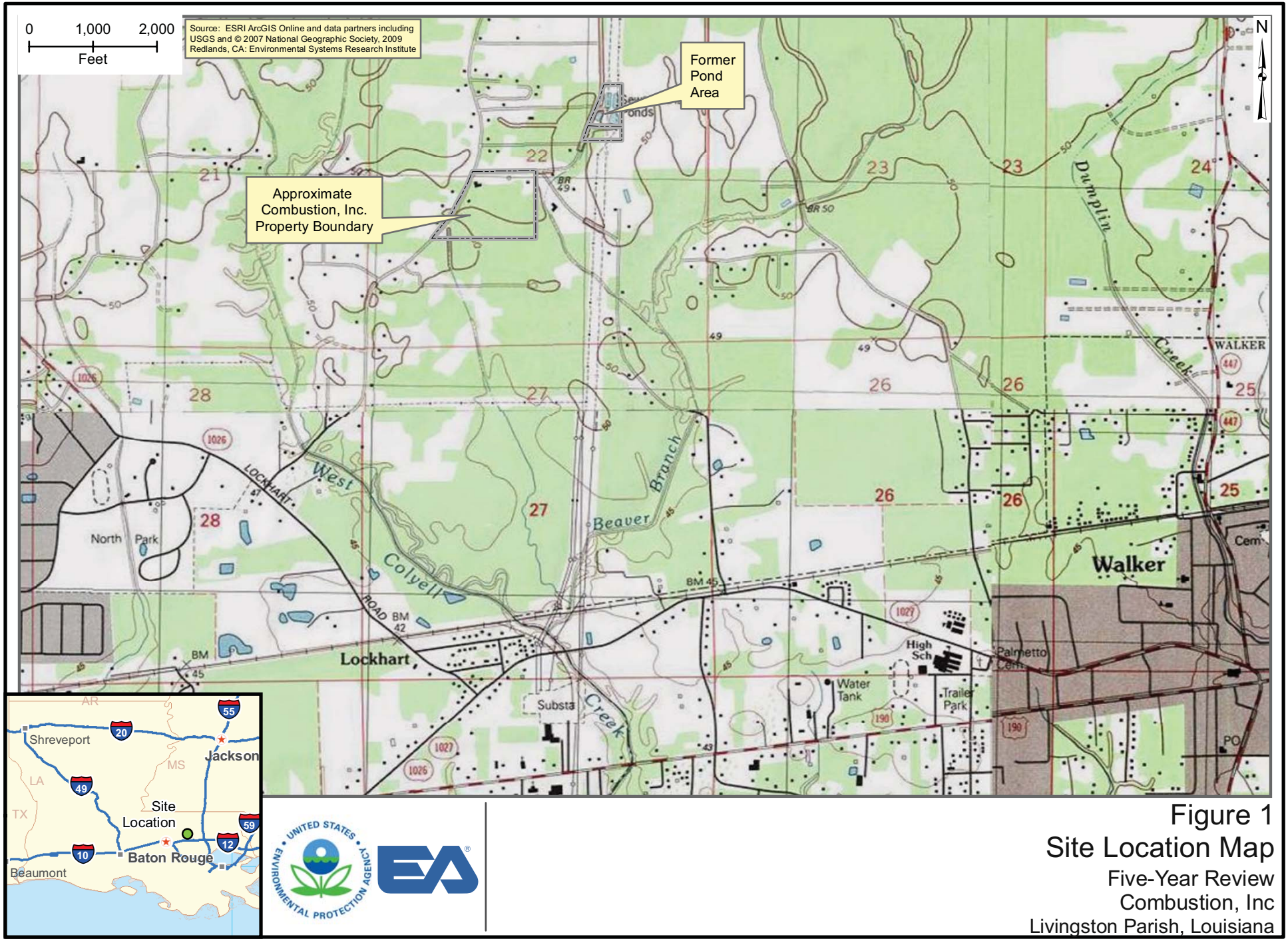

Figure 1
Site Location Map
Five-Year Review
Combustion, Inc
Livingston Parish, Louisiana

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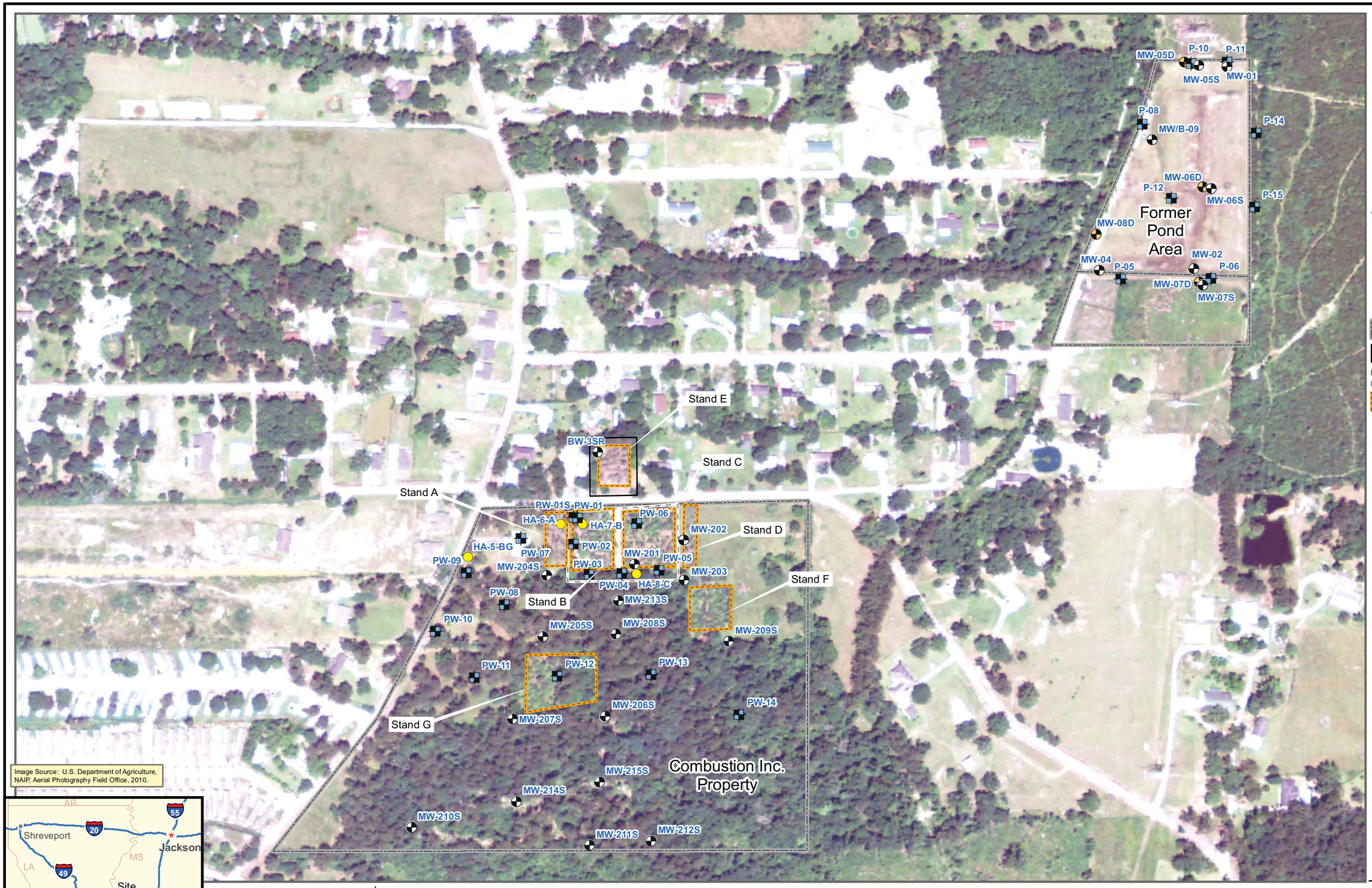

Figure 2
Site Layout Map

Five-Year Review
Combustion, Inc.
Livingston Parish, Louisiana

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Tables

TABLE 1

CHRONOLOGY OF SITE EVENTS
COMBUSTION, INC. SUPERFUND SITE

Date	Event
Late 1960s – Early 1980s	Dubose Oil Company and subsequently Combustion, Inc. operated primarily as a used oil reclamation facility
Early 1980s	Citizen complaints regarding the Combustion, Inc. facility operation
February 9, 1983	The Water Pollution Control Division under the State of Louisiana Department of Natural Resources, Office of Environmental Affairs, recommends enforcement action at the Site
April 15, 1985	Citizen's plea for help at the Site
June 28, 1985	Hazard Ranking System Scoring package prepared; issued October 29, 1985
June 20, 1986	Site is proposed for the first time on the NPL
August 5, 1986	LDEQ hosted a public informational meeting
April 8, 1987	Initial Settlement Agreement between state and PRP Group
June 4, 1987	Expedited Removal Action Feasibility Evaluation submitted by PRP Group to LDEQ
February 16, 1988	Under the direction of the PRP Group Technical Committee, an RI/FS Work Plan was prepared and submitted to LDEQ
June 24, 1988	Site re-proposed for inclusion on the NPL
September 27, 1988	PRP Group entered into a Remedial Investigation/ Feasibility Study Agreement with LDEQ
March 30, 1990	Preliminary Remedial Investigation Report was submitted to LDEQ (ERM-Southwest, revised November 7, 1991)
August 31, 1990	Site listed on NPL
July 14, 1992	PRP Group entered into ERA agreement with LDEQ
Late 1992 through 1993	ERA site activities
November 18, 1994	Phase II RI/FS Work Plan approved by LDEQ and EPA
December 5, 1997	Phase II RI Report approved by regulatory agencies
March 2001	Pilot project consisting of planting tree Stands A through G
September 2001	Revised Feasibility Study Report submitted
June 5, 2003	EPA conducts formal public meeting on proposed remedy
May 28, 2004	ROD signed by EPA
March 25, 2005	PRP Group sign RD/RA Cooperative Agreement
July 15, 2005	LDEQ conditionally approves RD Work Plan
August 29, 2005	Hurricane Katrina
September 24, 2005	Hurricane Rita
December 16, 2006	URS submits the Revised Final Process Area Field Sampling Plan
January 23, 2006	LDEQ approves Process Area Field Sampling Plan
January 26, 2006	LDEQ approves RAWP
March 31, 2006	RA construction kickoff (according to the 2010 Annual report)
April 4, 2006	Prefinal Remedy Inspection
June 14, 2006	Property Conveyance Notices were filed for registry and recorded in the Clerk of Court's office for Livingston, Parish
April 2006	Baseline groundwater sampling event
April 2006 – October 2006	Year 1 phytoremediation, natural attenuation, and monitoring
June 26, 2006	PCOR submitted to EPA by LDEQ
July 10, 2006	PCOR signed by LDEQ

TABLE 1

CHRONOLOGY OF SITE EVENTS
COMBUSTION, INC. SUPERFUND SITE

Date	Event
April 2007 – October 2007	Year 2 phytoremediation, natural attenuation, and monitoring
March 15, 2008	2nd Annual Groundwater Report submitted
April 2008 – October 2008	Year 3 phytoremediation, natural attenuation, and monitoring
September 1, 2008	Hurricane Gustav
September 13, 2008	Hurricane Ike
March 15, 2009	3rd Annual Groundwater Report submitted
April 2009 – October 2009	Year 4 phytoremediation, natural attenuation, and monitoring
March 15, 2010	4th Annual Groundwater Report submitted
July 2010	PRP Group submits 5th Annual Groundwater Report containing April 2010 results in format of Five-Year Review Report
March 2010 – October 2010	Year 5 phytoremediation, natural attenuation, monitoring
May 19, 2010	Site Inspection performed for the first five-year review for the Site
August 12, 2010	4th Annual Groundwater Report submitted
September 2010	First Five Year Report prepared for the Site

Notes:

EPA	U.S. Environmental Protection Agency
ERA	expedited removal action
FS	feasibility study
LDEQ	Louisiana Department of Environmental Quality
NPL	National Priorities List
PCOR	Preliminary Close-Out Report
PRP	potentially responsible party
RA	remedial action
RAWP	remedial action work plan
RD/RA	remedial action/remedial design
RI	remedial investigation
ROD	record of decision

TABLE 2

MONITORING, OPERATION, AND MAINTENANCE REQUIREMENTS
COMBUSTION, INC. SUPERFUND SITE

Project Year	Activity
Year 1	**Spring:** • Sample Upgradient, Sentinel, Perimeter, and Interior wells; SW-846 VOCs and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area (this excludes the UWBZ in the Pond Area); water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - E; Transpiration Rates (select one location to install system) • Sample Tree Stands A - E; LAI measurements • Perform Baseline Sampling Event • Determine initial groundwater EDC and TDA mean concentrations for 10% reduction calculations • BIOCHLOR and BIOSCREEN predictive modeling • Biogeochemical Monitoring Program: Former Process Area UWBZ zone Upgradient, Sentinel, Interior and Perimeter wells; evidence of alternate electron acceptors (nitrate, sulfate, and dissolved iron); degradation gases (methane, ethane, ethene, and carbon dioxide); degradation products (vinyl chloride and chloroethane) with SW846 Method 8260 analysis; methanogenic conditions (alkalinity); total organic carbon; sulfide; and chloride. **Summer** Sample Tree Stands A - E; Transpiration Rates (select one location to install system) **Fall** • Sample Sentinel, Perimeter, and Interior wells; SW-846 VOCs and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps Sample Tree Stands A - E; Tree and vegetative cover health parameters • Sample Tree Stands A, B & C; Rhizosphere Soil Gas Sampling (conditional on groundwater elevation)

TABLE 2 (continued)

MONITORING, OPERATION, AND MAINTENANCE REQUIREMENTS
COMBUSTION, INC. SUPERFUND SITE

Project Year	Activity
Year 2	**Spring:** • Sample Upgradient, Sentinel, Perimeter, and Interior wells: SW-846 VOCs and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - E: LAI measurements **Summer:** Sample Tree Stands A - G: Transpiration Rates (select one location to install system) **Fall:** • Sample Tree Stands A - G: Transpiration Rates (select one location to install system) • Sample Sentinel, Perimeter, and Interior wells: SW-846 VOCs and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - G: Tree and vegetative cover health parameters • Sample Tree Stands A, B & C: Rhizosphere Soil Gas Sampling (conditional on groundwater elevation)

TABLE 2 (continued)

MONITORING, OPERATION, AND MAINTENANCE REQUIREMENTS
COMBUSTION, INC. SUPERFUND SITE

Project Year	Activity
Year 3	**Spring:** • Sample Upgradient, Sentinel, Perimeter, and Interior wells: SW-846 VOCs and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - E: LAI measurements **Summer:** Sample Tree Stands A - G: Transpiration Rates (select one location to install system) **Fall:** • Sample Tree Stands A - G: Transpiration Rates (select one location to install system) • Sample Sentinel, Perimeter, and Interior wells: SW-846 VOCs and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - G: Tree and vegetative cover health parameters • Sample Tree Stands A, B & C: Rhizosphere Soil Gas Sampling (conditional on groundwater elevation)

TABLE 2 (continued)

MONITORING, OPERATION, AND MAINTENANCE REQUIREMENTS
COMBUSTION, INC. SUPERFUND SITE

Project Year	Activity
Year 4	**Spring:** • Sample Upgradient, Sentinel, Perimeter, and Interior wells: SW-846 VOCs and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - E: LAI measurements **Summer:** Sample Tree Stands A - G: Transpiration Rates (select one location to install system) **Fall:** • Rhizosphere Soils in Tree Stands A, B & C: FOC, TOC, VOAs, TDAs, & microbial counts • Sample Tree Stands A - G: Transpiration Rates (select one location to install system) • Sample Sentinel, Perimeter, and Interior wells: SW-846 VOCs and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - G: Tree and vegetative cover health parameters • Sample Tree Stands A, B & C: Rhizosphere Soil Gas Sampling (conditional on groundwater elevation) • Sample Tree Stands A, B & C: Tree Tissue Sampling

TABLE 2 (continued)

MONITORING, OPERATION, AND MAINTENANCE REQUIREMENTS
COMBUSTION, INC. SUPERFUND SITE

Project Year	Activity
Year 5	**Spring:** • Sample Upgradient, Sentinel, Perimeter, and Interior wells: SW-846 VOCs and TDA-related compounds • Biogeochemical Monitoring Program: UWBZ zone Upgradient, Sentinel, Interior and Perimeter wells; evidence of alternate electron acceptors (nitrate, sulfate, and dissolved iron); degradation gases (methane, ethane, ethene, and carbon dioxide); degradation products (vinyl chloride and chloroethane with SW846 Method 8260 analysis; methanogenic conditions (alkalinity); total organic carbon; sulfide; and chloride. • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - E: LAI measurements • Sample Tree Stands A - G: Transpiration Rates (select one location to install system) • Sample Rhizosphere Soils in Tree Stands A, B & C: FOC, TOC, VOCs, TDA, & microbial counts • Sample Tree Stands A, B & C: Transpiration Gas (conditional on tree tissue sample results) **Summer:** Sample Tree Stands A - G: Transpiration Rates (select one location to install system) **Fall:** • Sample Sentinel, Perimeter, and Interior wells: SW-846 volatiles and TDA-related compounds • UWBZ Potentiometric Program: All UWBZ wells and piezometers in the Former Process Area; water levels and potentiometric maps • LWBZ Potentiometric Program: All LWBZ wells in the Former Pond and Process Areas; water levels and potentiometric maps • Sample Tree Stands A - G: Tree and vegetative cover health parameters • Sample Tree Stands A, B & C: Rhizosphere Soil Gas Sampling (conditional on groundwater elevation) • Sample Tree Stands A, B & C: Tree Tissue Sampling • Sample Zone 1 and Zone 2 Pond Area Groundwater: VOAs • Geoprobe to collect Zone 1 groundwater sample west of CPT-14 in the Former Process Area

TABLE 2 (concluded)

MONITORING, OPERATION, AND MAINTENANCE REQUIREMENTS
COMBUSTION, INC. SUPERFUND SITE

Project Year	Activity
Notes:	
EDC	1,2-Dichloroethane
FOC	fraction of organic carbon
LAI	leaf area index
LWBZ	lower water bearing zone
O&M	operation and maintenance
TDA	toluenediamine
VOC	volatile organic compound
UWBZ	upper water bearing zone

TABLE 3

SITE POTENTIAL ARAS AND TBCS FOR PROCESS AREA VICINITY
COMBUSTION, INC. SUPERFUND

Medium	Potential ARAR/TBC and Legal Citation	Classification	Description	Applicability
A. Chemical-Specific				
Groundwater	1 . Safe Drinking Water Act (SDWA): 42USC300fetseq. a. Maximum Contaminant Levels (MCLs): 40 CFR 141 b. Maximum Contaminant Level Goals (MCLGs): 40 CFR 14 1.50-56	Relevant and Appropriate	a. Enforceable standards for public drinking water supply systems. b. Non-enforceable health goals for public water supply systems.	The upper and lower water-bearing zones are not current or potential sources of drinking water. The shallowest aquifer in the area that is used or potentially used for drinking water is the 400-foot sand which begins at a depth of about 200 feet below ground surface. The National Contingency Plan states that MCLs and nonzero MCLGs are ARARs for current or potential sources of drinking water.
	2. Resource Conservation and Recovery Act (RCRA) Groundwater Protection Standards: 40 CFR Part 264, Subpart F	Relevant and Appropriate	Enforceable standards set in RCRA for groundwater protection.	These standards are relevant and appropriate to groundwater monitoring activities associated with on-site management of materials determined to be hazardous wastes, if any.
	3. Louisiana Department of Environmental Quality Risk Evaluation/Corrective Action Program (RECAP) Standards	Relevant and Appropriate	Risk-based corrective action standards that take into consideration the protection of the environment, human health and the SDWA MCLs for drinking water.	These standards will be applied to groundwater.
	4. Louisiana Department of Natural Resources, Office of Conservation – Underground Injection Control (UIC) Program. (LAC43:XV11.103and l05)	Relevant and Appropriate	Enforceable provisions and standards for subsurface injection wells.	These standards are relevant and appropriate to the permitting, installation, and operation of Class V injection wells.

TABLE 3 (continued)

SITE POTENTIAL ARAS AND TBCS FOR PROCESS AREA VICINITY
COMBUSTION, INC. SUPERFUND

Medium	Potential ARAR/TBC and Legal Citation	Classification	Description	Applicability
	5. Louisiana Water Quality Standards (LAC33:IX.1I13)	To be considered (TBC)	Enforceable standards for surface water bodies designated as Drinking Water Supplies. These standards also protect for primary and secondary contact recreation and for fish consumption.	To be considered for actions involving groundwater recovery and treatment.
	6. EPA Health Advisories	TBC	Non-enforceable guidelines for public water supply systems.	To be considered as guidelines in the absence of MCLs and MCLGs for actions involving groundwater recovery and treatment.
Surface Water	1. Louisiana Water Quality Standards: (LAC 33:1X.1113)	Relevant and Appropriate	Enforceable standards that are protective of the beneficial uses (drinking water supply, protection of aquatic life, recreational uses) of surface water bodies in the state of Louisiana.	These standards are relevant and appropriate in the event of ground water from the Process Area being discharged to a surface water body via a subsurface route or after treatment.
	2. Clean Water Act (CWA): 33 USC 125 et. Seq. a. Federal Water Quality Standards: 40 CFR 131	Relevant and Appropriate	Criteria that are used in conjunction with the water designated use classification to establish surface water quality standards.	The Louisiana Water Quality Standards (LWQS) are based on the federal water quality criteria where appropriate to protect the designated uses of surface water bodies; therefore, the federal criteria have been incorporated into the LWQS.
B. Location Specific				

TABLE 3 (continued)

SITE POTENTIAL ARAS AND TBCS FOR PROCESS AREA VICINITY
COMBUSTION, INC. SUPERFUND

Medium	Potential ARAR/TBC and Legal Citation	Classification	Description	Applicability
	1. Endangered Species Act of 1 973 : 1 6 use 1 53 1 , 40 CFR 6.302(h)	Relevant and Appropriate	Requires federal agencies to ensure that action authorized by an agency is not likely to jeopardize the existence of any species on the endangered or threatened list, or adversely affect its critical habitat.	No rare, threatened, or endangered species are known to occur within the Process Area or nearby vicinity. Identification of a threatened or endangered species during remedial action would require consultation and permitting as specified by Section 7 of the Act.
	2. National Historic Preservation Act: 16 use Section 461, 469 and 470; 40 CFR 6.30 l(b)	Relevant and Appropriate	Sets guidelines for remedial actions at or near historic properties included on or eligible for inclusion on the National Register of Historic Places. Remedial actions must ensure that potential historic areas are not adversely affected.	No historic properties have been identified within the Process Area or nearby vicinity; however, this act would be relevant and appropriate if any historic areas are discovered during remedial actions. A cultural resources review may be required prior to implementing any remedial actions.
	3. Fish and Wildlife Coordination Act: l6USC661;40CFR6.302(g)	Relevant and Appropriate	Sets standards for protection of fish and wildlife when federal actions result in control or structural modification of a natural stream or water body.	This act would be relevant and appropriate for any remedial actions that would modify streams or water bodies.
	4. Archeological and Historical Preservation Act: 1 6 use 469a- 1 , 40 CFR 6.30 1 (c)	Relevant and Appropriate	Provides for the recovery and preservation of data if an action authorized by the USEPA may cause irreparable loss or destruction of significant scientific, prehistoric, historic, or archeological data.	No scientific, prehistoric, historic or archeological artifacts have been identified within the Process Area or nearby vicinity; however, this act would be relevant and appropriate should any such artifacts be discovered during remediation.

TABLE 3 (continued)

SITE POTENTIAL ARAS AND TBCS FOR PROCESS AREA VICINITY
COMBUSTION, INC. SUPERFUND

Medium	Potential ARAR/TBC and Legal Citation	Classification	Description	Applicability
C. Action Specific				
Air	1. Clean Air Act, as amended: 42 use 740 1-7671 a. National Ambient Air Quality Standards: 40 CFR 50 b. National Emission Standard for Benzene Waste Operations: 40 CFR 61, Subpart FF	Relevant and Appropriate	Standards promulgated for air emissions of certain air pollutants. Applies to hazardous waste treatment, storage or disposal (TSD) facilities that treat, store, or dispose of benzene containing waste generated by chemical manufacturing plants, coke by-product recovery plants, or petroleum refineries.	a. Relevant and appropriate for any remedial treatment technologies that include sources of air emissions. b. Relevant and appropriate if benzene containing waste is generated during remedial actions.
	2. Louisiana Air Quality Regulations	Relevant and Appropriate	Regulations designed to maintain the purity of the air resources of the state of Louisiana.	Relevant and appropriate for any remedial treatment technologies that include sources of air emissions.
	3. Control of Air Emissions from Air Strippers at Superfund Groundwater Sites: OSWER Directive 9355.0-28	Relevant and Appropriate	Policy to guide the selection of controls for air strippers at groundwater sites according to the air quality at the site.	To be considered for discharges from air strippers for any remedial treatment technologies that include the use of air strippers.

TABLE 3 (continued)

SITE POTENTIAL ARAS AND TBCS FOR PROCESS AREA VICINITY
COMBUSTION, INC. SUPERFUND

Medium	Potential ARAR/TBC and Legal Citation	Classification	Description	Applicability
Surface water	1. Clean Water Act: 33 use 1251 et seq. a. Louisiana Pollutant Discharge Elimination System (LPDES): LAC33:IX.Chapter23, Louisiana has been delegated authority to administer the National Pollutant Discharge Elimination System (NPDES) 33 use 1342 (Sec. 402), 40eFR 122 and 125 b. Permits for Dredged or Fill Material: 33 use 1344 (Sec. 404)	Relevant and Appropriate	Enforceable standards for discharge of pollutants to surface water. Standards are set to maintain water quality consistent with public health and recreation, propagation and protection of aquatic life, and other beneficial uses of water. The disposition of dredged or excavated materials into the waters of the U.S. is regulated under Section 404.	Relevant and appropriate for any remedial treatment technologies that involve the discharge of treated water into the waters of the state. Water discharge criteria would be required before discharge of any treated water into the Colyell Creek System of the Lake Pontchartrain Basin or to any other water of the state. The Colyell Creek System is designated as an impaired waterbody on the state 303(d) list for organic enrichment as well as other parameters. A Total Maximum Daily Load (TDML) must be implemented to restrict the discharge of organic pollutants to this waterbody. LDEQ has scheduled TMDL development for the Colyell Creek System in 2006. Relevant and appropriate for any remedial actions that involve the discharge of excavated or fill material.
	2. Executive Order 1 1988 - Floodplain Management: 40 CFR 6.302(b)	Relevant and Appropriate	Requires Federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid the adverse impacts associated with direct and indirect development of a floodplain.	The Process Area is not within the 100-year flood zone; however, this order would be relevant and appropriate for any remedial actions that involve the discharge of any excavated or fill material into a floodplain area.

TABLE 3 (continued)

SITE POTENTIAL ARAS AND TBCS FOR PROCESS AREA VICINITY
COMBUSTION, INC. SUPERFUND

Medium	Potential ARAR/TBC and Legal Citation	Classification	Description	Applicability
	3. Executive Order 1 1 990 – Wetlands Protection: 40 CFR 6.302(a)	Relevant and Appropriate	Requires Federal agencies to avoid the adverse impacts associated with the destruction or loss of wetlands, to avoid new construction in wetlands if alternatives exist, and to develop mitigation measures if adverse impacts are unavoidable.	The Process Area does not contain wetlands; however, this order would be relevant and appropriate for any remedial actions that involve the discharge of any excavated or fill material into a wetlands area.
Soil/Solid Waste	1. Resource Conservation and Recovery Act (RCRA) 42 use 6901 et seq.	Relevant and Appropriate	Enforceable standards for management and disposal of hazardous wastes.	Relevant and appropriate for any on-site or off-site disposal activities or remedial actions involving landfilling, capping, or excavation of soils and materials classified as hazardous waste.
	a. Louisiana Solid Waste Rules and Regulations: LAe 33:VII	Relevant and Appropriate	Regulations governing the storage, collection, processing, recovery and reuse, and disposal of solid waste.	Relevant and appropriate for any remedial actions involving the storage, transportation, treatment, and/or disposal of solid waste.
	b. Hazardous Waste Management System - General Federal: 40 CFR 260 State: LAC 33:V.Chapter 1	Relevant and Appropriate	Establishes procedures and criteria for modification or revocation of any provision in 40 CFR 260-265; LAC:V.	Relevant an appropriate for delisting hazardous wastes, if any, generated during remedial actions at the site.
	c. Identification and Listing of Hazardous Waste Federal: 40 CFR 261 State: I^C 33:V.Chapter49	Relevant and Appropriate	Defines solid wastes which are subject to regulation as hazardous wastes.	Relevant and appropriate to the management of wastes determined to be hazardous wastes, if any.

TABLE 3 (continued)

SITE POTENTIAL ARAS AND TBCS FOR PROCESS AREA VICINITY
COMBUSTION, INC. SUPERFUND

Medium	Potential ARAR/TBC and Legal Citation	Classification	Description	Applicability
	d. Standards Applicable to the Generators of Hazardous Waste Federal: 40 CFR 262, State: LAC 33:V.Chapter 1 1	Relevant and Appropriate	Establishes procedures and standards for generators of hazardous waste.	Relevant and appropriate in the event that remedial actions involve the generation of wastes determined to be hazardous wastes.
	f. Standards Applicable to the transporters of Hazardous Waste Federal: 40 CFR 263 State: LAC 33:V.Chapter 13	Relevant and Appropriate	Establishes procedures and standards for the transportation of hazardous waste.	Relevant and appropriate in the event that remedial actions involve the transportation of wastes determined to be hazardous wastes.
	g. Land Disposal Restriction Federal: 40 CFR 268 State: LAC 33:V.Chapter22, Subchapter A	Relevant and Appropriate	Identifies hazardous wastes that are restricted from land disposal and defines circumstances under which an otherwise prohibited waste could continue to be land-disposed.	Relevant and appropriate in the event that remedial actions involve the land disposal of wastes determined to be restricted hazardous wastes.
	2. U.S. DOTD Rules for Transport of Hazardous Materials: 49 CFR 107	Relevant and Appropriate	Establishes standards for transporters of hazardous materials including waste determination, manifests, and pre-transport requirements.	Relevant and appropriate in the event that remedial actions involve the transportation of wastes determined to be hazardous materials. These standards regulate employee exposure to air contaminants and provide guidelines for equipment handling and personal protection.

TABLE 3 (concluded)

SITE POTENTIAL ARAS AND TBCS FOR PROCESS AREA VICINITY
COMBUSTION, INC. SUPERFUND

Medium	Potential ARAR/TBC and Legal Citation	Classification	Description	Applicability
Miscellaneous	1. Occupational Safety and Health Act (OSHA): 29 CFR 1910, 1926	TBC	Provides enforceable occupational safety and health standards (permissible exposure limits; PELs) for workers engaged in on-site field activities. Also establishes training requirements for workers at hazardous waste remediation sites.	Depending on the remedial action implemented at the site, the air contaminant standards (29 CFR 1910) and/or construction industry standards (29 CFR 1926) may be applicable.
	2. National Institute for Occupational Safety and Health (NIOSH) Guidelines	TBC	Provides non-enforceable recommended exposure limits (RELs) for occupational activities involving chemicals with OSHA PELs.	These are guidelines for worker exposure to air contaminants.
	3. American Conference of Governmental Industrial Hygienists (ACGIH) Guidelines	TBC	Provides 8-hour time-weighted average concentration limits for occupational exposure to hazardous chemicals.	These are guidelines for worker exposure to air contaminants.

Notes:
ARAR Applicable or Relevant and Appropriate Requirement
TBC To Be Considered

TABLE 4

CLEANUP LEVELS COMPARISON
COMBUSTION, INC. SUPERFUND SITE

Constituent of Concern	Cleanup Level from ROD (mg/L)	Current MCL (mg/L)
2,4/2,6 Toluenediamine	0.01	NA
o- and/or p-Toluidine	0.01	NA
1,1,2-Trichloroethane	0.005	0.005
1,1-Dichloroethane	0.749	NA
1,1-Dichloroethene	**0.006**	**0.007**
1,2-Dichloroethane	0.005	0.005
Acetone	0.564	NA
Benzene	0.005	0.005
Chloroethane	0.028	NA
Cis-1,2-dichloroethene	**0.518**	**0.07**
Methylene chloride	**0.004**	**0.005**
Tetrachloroethene	0.005	0.005
Toluene	1.00	1.00
Vinyl chloride	0.002	0.002

Notes:
Shaded/bold cells indicated changes from MCL since ROD was issued.
MCL maximum concentration level
mg/L milligram per liter
ROD record of decision

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS
COMBUSTION INC. SUPERFUND SITE

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)	
					Current	Future
1. Ground water concentrations for the two tracking contaminants, EDC and TDA, met the 10% reduction in geometric mean concentration criteria specified in the ROD.	Implementation of the Hot Spot Treatment Contingency remedy as described in the ROD is not necessary.	PRP	LDEQ/ EPA	2011	No	Yes
2. No vertical migration of COCs into the lower water-bearing zone has been demonstrated for the site.	No contamination has been identified in the lower water-bearing zone. In order to verify no migration occurs and that the RAOs continue to be met for this unit, the lower water-bearing zone will be monitored for all COCs prior to each five-year review.	PRP	LDEQ/ EPA	2016	No	Yes
3. The trends for the tracking constituents, TDA and EDC, are not similar for all COCs.	As the parent contaminants degrade and the daughter products increase, focus should shift from the target contaminants, EDC and 2,4/2,6-TDA, to a more comprehensive reporting that includes all parent contaminants. All COCs will continue to be monitored semiannually; therefore, future annual reports should include trend graphs and plume delineation figures for all parent COCs. Text discussion should be considered for those that are below the ROD cleanup level, infrequently detected, or isolated to one or two well locations.	PRP	LDEQ/ EPA	Annually	No	Yes

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS
GULF STATES UTILITIES SUPERFUND SITE (continued)

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)	
					Current	Future
4. Daughter compounds, such as toluene, are increasing above the cleanup levels due to degradation.	As the parent contaminants degrade and the daughter products increase, focus should shift from the target contaminants, EDC and TDA, to a more comprehensive reporting that includes all daughter contaminants. All COCs should continue to be monitored semiannually; therefore, future annual reports should include trend graphs and plume delineation figures for all daughter COCs. Text discussion should be considered for those that are below the ROD cleanup level, infrequently detected, or isolated to one or two well locations.	PRP	LDEQ/ EPA	Annually	No	Yes
5. Detection limits for some compounds are at or above the cleanup levels.	Coordination with the laboratory to obtain lower detection limits should continue while lower detection limits for those wells that are considered not impacted should be requested. The PRPs currently work closely with the selected laboratory and are aware of the issues (remedy performance and analytical error) related to having detection limits at or near the cleanup levels. The laboratory has difficulty in obtaining lower detection for wells that are impacted by high concentrations of contaminants and this is expected to be resolved as these concentrations decrease over time. However, for those wells considered not impacted and/or downgradient, analytical methods and laboratories should be able to achieve, ideally, sample quantitation limits an order of magnitude below the cleanup level so that performance of the remedy can be assessed and analytical error is not significant. If sample matrix interferes with the analysis, usefulness of and consideration of reporting both the pre- and post-dilution laboratory results should be discussed. Updates regarding this issue will be summarized and presented in the annual reports.	PRP	LDEQ/ EPA	Annually	No	Yes

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS
GULF STATES UTILITIES SUPERFUND SITE (continued)

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)	
					Current	Future
6. Establishment of a phytoremediation-induced gradient was inconclusive.	In accordance with the ROD, the Phytoremediation component was included as an enhancement to natural attenuation and designed to plant trees within and downgradient of the process area to inhibit movement of ground water contaminants toward the downgradient perimeter of the contamination and to degrade contaminants within the plume. Sap flow measurements indicate that the trees are extracting contaminated ground water. Tree core sampling data presented estimated detections of daughter products, were not consistent from year to year, and were not consistent within the same tree. These issues present uncertainty in the data; however, estimated detections of toluene within the tree tissue shows a connection with and uptake of the contaminated ground water as this is the source of toluene contamination at the site. In addition, phytodegradation may be the primary process for contaminant degradation within the tree. This process would breakdown the site contaminants through the metabolic process rendering potential detection of site contaminants low. Although no significant change in the ground water gradient has been noted, evidence of plume mass reduction and the lack of plume migration, either down gradient or vertically, support the intended purpose of the Phytoremediation stands as described in the ROD. Sap flow monitoring, tree core monitoring, and water level monitoring will continue to be implemented according to the schedule presented in the December 2005 Field Sampling Plan in order to document that Phytoremediation continues to extract and degrade COCs.	PRP	EPA	Annually	No	No

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS
GULF STATES UTILITIES SUPERFUND SITE (continued)

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)	
					Current	Future
7. Several biochemical parameters sampled to support MNA, may indicate a change in the site conditions that could influence the continued effectiveness of the MNA component of the remedy.	MNA biochemical parameters should continue to be monitored and reported prior to each five-year review. These parameters are primary indicators of site conditions that demonstrate the continued capacity of the site to support contaminant degradation in areas outside of the Phytoremediation areas. These parameters coupled with parent and daughter contaminant concentrations and distributions should be used to monitor plume dynamics (reducing, stable, expanding).	PRP	LDEQ/ EPA	2016	No	Yes
8. Several parameters measured in support of phytoremediation provided limited useful information to demonstrate contaminant biodegradation.	Rhizosphere sampling (soil, soil gas and microbial), transpiration gas, and tree stand health indicators should not be continued. Data provided through rhizosphere and transpiration gas sampling indicate that these degradation pathways are not significant. The tree stands at the site are established, robust, and healthy; therefore, annual detailed measurements and observations related to individual tree health are no longer necessary. However, the tree stands should be visually inspected during site maintenance work by the arborist to verify continued tree growth and overall health. General reporting on overall tree stand health should be included in the annual reports.	PRPs	LDEQ/ EPA	2011	No	No

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS
GULF STATES UTILITIES SUPERFUND SITE (continued)

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)	
					Current	Future
9. The number of data points used to verify BIOCHLOR and BIOSCREEN modeling is limited.	Current site conditions support continued operation of the Phytoremediation plus natural attenuation remedy. The ground water monitoring program provides data used to confirm the primary lines of evidence necessary to evaluate the remedy and includes sampling for parent contaminants, daughter contaminants, contaminant concentration reduction over time, hydraulic flow patterns, natural attenuation biochemical markers, and Phytoremediation parameters (tree tissue and sap flow). The continued use of the BIOSCREEN and BIOCHLOR screening predictive models will be based on site parameters, primarily, the condition of the plume (shrinking, steady, expanding), contaminant concentrations, and the natural attenuation biochemical markers. Use of the BIOSCREEN and BIOCHLOR screening models will be reviewed during each annual report to determine whether it's use will be necessary during the next Five-Year review.	PRP	LDEQ/ EPA	Annually	No	No

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS
GULF STATES UTILITIES SUPERFUND SITE (continued)

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)	
					Current	Future
10. To date, both the EDC and TDA plumes have shrunk and the decay rate constants are decreasing rather than staying constant or increasing, suggesting that the ROD-required Buscheck and Alcantar method may no longer be applicable.	Current site conditions support continued operation of the Phytoremediation plus natural attenuation remedy. Buscheck and Alcantar (1995) rate constants are calculated and used to evaluate contaminant degradation. This method applies regression techniques and analytical solutions to estimate the overall attenuation of stable dissolved phase plumes. Site data show the plumes to be shrinking and the contaminant concentrations to be reducing. The continued use of the Buscheck and Alcantar (1995) rate constant methodology will be based on site parameters, primarily, the condition of the plume (shrinking, steady, expanding), contaminant concentrations, and the natural attenuation biochemical markers. Use of the Buscheck and Alcantar (1995) rate constant methodology is currently used to evaluate EDC an TDA as these are the tracking contaminants. As site contaminants degrade and daughter products become more prevalent, applicability and the use of decay rate constants, or the use of other models/calculations, as they relate to parent and daughter products will be reviewed in each annual report. All site COCs, parent and daughter, will continue to be evaluated at each monitoring well through the use of first-order decay trend graphs.	PRP	LDEQ/ EPA	Annually	No	No
11. The cleanup level for *cis* 1,2-dichloroethene is set at 0.518 mg/L, which is significantly higher than the MCL of 0.07 mg/L.	Currently, the ground water pathway is incomplete, and will remain restricted from use through enforcement of the ICs by both the LDEQ and the PRPs. The concentrations of *cis* 1,2-dichloroethene are below the cleanup level established in the ROD and the current MCL. This contaminant will continue to be monitored and reported in each annual report to document continued attainment of both the MCL and ROD cleanup level.	PRP	LDEQ/ EPA	Annually	No	Yes

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS
GULF STATES UTILITIES SUPERFUND SITE (continued)

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)	
					Current	Future
12. The human health risk assessment did not evaluate volatilization from ground water to indoor air for the Process Area.	Currently this pathway is incomplete. The site will remain restricted to industrial/commercial use through enforcement of the ICs by both the LDEQ and the PRPs. The Louisiana Risk Evaluation/Corrective Action Program (RECAP) evaluation provided in the December 8 PRP letter, indicates that the indoor air exposure pathway is not a concern. Attainment of the remedial action objectives will indicate that all ground water cleanup levels in the ROD have been achieved, and it is expected that no ground water contamination will be present at levels of concern. Therefore, no human health exposure under the indoor air pathway would be expected. The necessity for further evaluation of this pathway will be reviewed should the potential for reuse and construction be proposed.	PRP	LDEQ/ EPA	2016	No	Yes
13. Human health risk assessment methodologies for dermal and inhalation toxicity have changed since the assessment was performed at the site.	Currently the ground water pathway is incomplete. The primary driver in the risk assessment evaluation of ground water was ingestion. Changes associated with the dermal and inhalation pathways are not significant and do not alter the ROD decision to address ground water contamination. The land use will remain restricted to industrial/commercial use and the ground water will remain restricted from any use through enforcement of the ICs by both the LDEQ and the PRPs. The ROD cleanup levels were re-evaluated by the responsible parties and presented in the December 8 PRP letter followed by the December 13 PRP letter. Based on this review, the ROD cleanup levels continue to be appropriate cleanup levels for the site ground water. An update, review, and evaluation of the ROD cleanup levels will be performed prior to each five-year review to determine whether the ROD cleanup levels continue to be appropriate.	PRP	LDEQ/ EPA	2016	No	Yes

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS
GULF STATES UTILITIES SUPERFUND SITE (continued)

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions Affect Long-Term Remedy Protectiveness (Yes/No)	
					Current	Future

Notes:

COC	contaminant of concern
mg/L	milligram per liter
EDC	1,2-dichloroethane
EPA	U.S. Environmental Protection Agency
DO	dissolved oxygen
MCL	Maximum Contaminant Level
mg/L	milligram per liter
MNA	monitored natural attenuation
ORP	oxidation-reduction potential
PRP	potentially responsible party
ROD	record of decision
TDA	2,4/4,6-toluenediamine

Attachment 1

Documents Reviewed

DOCUMENTS REVIEWED

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Attachment 2

Site Inspection Checklist

SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Combustion Inc. Superfund Site	**Date of Inspection:** May 20, 2010
Location and Region: Livingston, Louisiana	**EPA ID:** LAD072606627
Agency, office, or company leading the five-year review: U.S. Environmental Protection Agency, Region 6	**Weather/temperature:** 100F, humid, sunny

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Ground water pump and treatment??
- ☐ Surface water collection and treatment
- ☒ Other: Phytoremediation & MNA

Attachments: ☒ Inspection team roster attached ☒ Site map attached (Figure 2 of report)

II. INTERVIEWS (Check all that apply)

1. O&M Site Manager URS (Collective Effort) (Name) July 26, 2010 (Date)

Interviewed: ☐ by e-mail ☐ at site ☐ by phone Phone no. 225-922-5780

Problems, suggestions: ☐ Survey attached E-mail NA

2. O&M Staff Cheryl Warren (Name) Project Manager for URS (Title) July 26, 2010 (Date)

Interviewed: ☒ by e-mail ☐ at site ☐ by phone Phone no. 225-922-5780

Problems, suggestions: ☒ Report attached E-mail: Cheryl_warren@urscorp.com

3. Local regulatory authorities and response agencies (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, etc.). Fill in all that apply.

Agency Louisiana Department of Environmental Quality (LDEQ)

Contact Todd Thibodeau (Name) Environmental Scientist (Title) May 19, 2010 (Date) 225-219-3212 (Phone no.)

Problems, suggestions: ☒ Report attached

Agency _____

Contact _____ (Name) _____ (Title) _____ (Date) ( ) _____ (Phone no.)

Problems, suggestions: ☐ Report attached _____

4. Other interviews (optional): ☒ Reports attached to Five-Year Review Report

- Mr. Mike Pisani, PRP Project Manager
- Mr. and Mrs. [redacted], local resident
- Mr. [redacted], local resident
- Ms. [redacted], local resident
- Mr. [redacted], local resident
- Honorable James E. Durbin, Mayor, City of Denham Springs

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. O&M Documents

☒ O&M manual (long term monitoring plan)	☐ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☐ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs	☐ Readily available	☒ Up to date	☐ N/A

Remarks: at URS offices

2. Site-Specific Health and Safety Plan ☐ Readily available ☒ Up to date ☐ N/A

☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

Remarks: at URS office

3. O&M and OSHA Training Records ☐ Readily available ☐ Up to date ☐ N/A

Remarks: not verified

4. Permits and Service Agreements

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

5. Gas Generation Records ☐ Readily available ☐ Up to date ☒ N/A

6. Settlement Monument Records ☐ Readily available ☐ Up to date ☒ N/A

7. Ground Water Monitoring Records ☐ Readily available ☒ Up to date ☐ N/A

8. Leachate Extraction Records ☐ Readily available ☐ Up to date ☒ N/A

9. Discharge Compliance Records

☐ Air	☐ Readily available	☐ Up to date	☒ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

10. Daily Access/Security Logs ☐ Readily available ☐ Up to date ☒ N/A

Remarks: no logs for site entry are maintained.

IV. O&M COSTS

1. O&M Organization

☐ State in-house ☐ Contractor for State ☐ PRP in-house

☒ Contractor for PRP ☐

2. O&M Cost Records

☐ Readily available ☐ Up to date ☐ Funding mechanism/agreement in place

☐ Original O&M cost estimate ☐ Breakdown attached

Total annual cost by year for review period, if available

Date	Date	Total Cost	Total Cost	
From _____	to _____	$ _____		☐ Breakdown attached
From _____	to _____	$ _____	- _____	☐ Breakdown attached
From _____	to _____	$ _____	- _____	☐ Breakdown attached
From _____	to _____	$ _____	- _____	☐ Breakdown attached
From _____	to _____	$ _____		☐ Breakdown attached

3. Unanticipated or Unusually High O&M Costs During Review Period

See report; repairs due to hurricane damage _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. Fencing damaged - No ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: Fencing in good shape, gates secured & locked.

B. Other Access Restrictions

1. Signs and other security measures ☐ Location shown on site map ☐ N/A

Remarks: signs every few hundred feet, clearly marked w/ emergency contact phone numbers.

C. Institutional Controls

1. Implementation and enforcement

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Drive by

Frequency when performing site O&M and monitoring.

Responsible party/agency PRP Contractor

Contact Cheryl Warren (Name) Project Manager URS (Title) 225-922-5780 (Phone no.)

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☒ No ☐ N/A

Other problems or suggestions: ☐ Report attached

2. Adequacy ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks:

D. General

1. Vandalism/trespassing ☐ Location shown on site map ☒ No vandalism evident

Remarks:

2. Land use changes onsite ☒ N/A

Remarks:

3. Land use changes offsite ☒ N/A

Remarks:

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. Roads damaged ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks: no roads at the site

B. Other Site Conditions

Remarks:

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. Settlement (Low spots) ☐ Location shown on site map ☐ Settlement not evident

Areal extent Depth

Remarks:

2. Cracks ☐ Location shown on site map ☐ Cracking not evident

Lengths Widths Depth

Remarks:

3. Erosion ☐ Location shown on site map ☐ Erosion not evident
Areal extent _____ Depth _____
Remarks: _____

4. Holes ☐ Location shown on site map ☐ Holes not evident
Areal extent _____ Depth _____
Remarks: _____

5. Vegetative Cover ☐ Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks: _____

6. Alternative Cover (armored rock, concrete, etc.) ☐ N/A
Remarks: Gravel - in good shape

7. Bulges ☐ Location shown on site map ☐ Bulges not evident
Areal extent _____ Depth _____
Remarks: _____

8. Wet Areas/Water Damage ☐ Wet areas/water damage not evident

☐ Wet areas	☐ Location shown on site map	☐ Areal extent _____
☐ Ponding	☐ Location shown on site map	☐ Areal extent _____
☐ Seeps	☐ Location shown on site map	☐ Areal extent _____
☐ Soft subgrade	☐ Location shown on site map	☐ Areal extent _____

Remarks: _____

9. Slope Instability ☐ Slides ☐ Location shown on site map
☐ No evidence of slope instability Areal extent _____
Remarks: _____

B. Benches ☐ Applicable ☐ N/A

1. Flows Bypass Bench ☐ Location shown on site map ☐ N/A
Remarks: _____

2. Bench Breached ☐ Location shown on site map ☐ N/A
Remarks: _____

3. Bench Overtopped ☐ Location shown on site map ☐ N/A
Remarks: _____

C. Letdown Channels ☐ Applicable ☐ N/A

1. Settlement ☐ Location shown on site map ☐ N/A
Areal extent _____ Depth _____
Remarks: _____

2. Material Degradation ☐ Location shown on site map ☐ N/A
Material type _____ Areal extent _____
Remarks: _____

3. Erosion ☐ Location shown on site map ☐ N/A
Areal extent _____ Depth _____
Remarks: _____

4. Undercutting ☐ Location shown on site map ☐ N/A
Areal extent _____ Depth _____
Remarks: _____

5. Obstructions Type _____
☐ No obstructions ☐ N/A
Areal extent _____ Size _____
Remarks: _____

6. Excessive Vegetative Growth Type _____
☐ No evidence of excessive growth ☐ N/A
☐ Location shown on site map Areal extent _____
Remarks: _____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. Gas Vents ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: _____

2. Gas Monitoring Probes
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: _____

3. Monitoring Wells (within surface area of landfill)
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: _____

4. Leachate Extraction Wells
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: _____

5. Settlement Monuments ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. Gas Treatment Facilities
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs O&M ☐ N/A
Remarks: _____

2. Gas Collection Wells, Manifolds, and Piping ☐ Good condition ☐ N/A
Remarks: _____

3. Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs O&M ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. Outlet Pipes Inspected ☐ Functioning ☐ N/A

Remarks: _____

2. Outlet Rock Inspected ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. Siltation Areal extent _____ Size _____

☐ N/A ☐ Siltation not evident

Remarks: _____

2. Erosion Areal extent _____ Depth _____

☐ N/A ☐ Erosion not evident

Remarks: _____

3. Outlet Works ☐ Functioning ☐ N/A

Remarks: _____

4. Dam ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☐ N/A

1. Deformations ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement _____ Vertical displacement _____

Rotational displacement _____ ☐ N/A

Remarks: _____

2. Degradation ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. Siltation ☐ Location shown on site map ☐ Siltation not evident

Areal extent _____ Depth _____

Remarks: _____

2. Vegetative Growth ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Areal extent _____ Type _____

Remarks: _____

3. Erosion ☐ Location shown on site map ☐ Erosion not evident

Areal extent _____ Depth _____

Remarks: _____

4. Discharge Structure ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. Settlement ☐ Location shown on site map ☐ Settlement not evident

Areal extent _____ Depth _____

Remarks: _____

2. Performance Monitoring Type of monitoring _____

☐ Performance not monitored Frequency _____ ☐ Evidence of breaching

Head differential _____

Remarks: _____

IX. GROUND WATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Ground Water Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. Pumps, Wellhead Plumbing, and Electrical

☐ Good condition ☐ All required wells located ☐ Needs O&M ☐ N/A

Remarks: _____

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances

☐ Good condition ☐ Needs O&M

Remarks: _____

3. Spare Parts and Equipment

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. Collection Structures, Pumps, and Electrical

☐ Good condition ☐ Needs O&M

Remarks: _____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances

☐ Good condition ☐ Needs O&M

Remarks: _____

3. Spare Parts and Equipment

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

1. Treatment Train (Check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon absorbers
☐ Filters _____
☐ Additive (e.g., chelation agent, flocculent) _____
☐ Others _____
☐ Good condition ☐ Needs O&M
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of ground water treated annually _____
☐ Quantity of surface water treated annually _____

Remarks: _____

2. Electrical Enclosures and Panels (Properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs O&M

Remarks: _____

3. Tanks, Vaults, Storage Vessels

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs O&M

Remarks: _____

4. Discharge Structure and Appurtenances

☐ N/A ☐ Good condition ☐ Needs O&M

Remarks: _____

5. Treatment Building(s)

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored

Remarks: _____

6. Monitoring Wells (Pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs O&M ☐ N/A

Remarks: _____

D. Monitored Natural Attenuation ☒ Applicable ☐ N/A

1. Monitoring Wells (Natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled (semi-annually) ☒ Good condition
☒ All required wells located ☐ Needs O&M ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site that are 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.

Phytoremediation also applied to the Management of Migration groundwater operable unit; see five-year report for details on remedy evaluation.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Field inspection did not reveal any issues with the remedy at the Site

B. Adequacy of O&M

O&M activities appear to be sufficient – tree stands are healthy, fencing secure, lawns are kept mowed & in good shape. Purged water is properly disposed of within required time frames.

C. Early Indicators of Potential Remedy Failure

None observed during the field visit; see five-year review report for potential indicators

D. Opportunities for Optimization

None observed during the field visit; see five-year review report for potential opportunities for optimization

INSPECTION TEAM ROSTER
Thursday, May 20, 2010

Name	Organization	Title
Katrina Higgins Coltrain	EPA	Project Manager
Todd Thibodeaux	LDEQ	Environmental Scientist
Michael Pisani	MP&A	Project Manager
Carlton Todd	MP&A	Sr. Engineer
Dwayne Johnson	Liskow & Lewis	Attorney for PRP
Bill Hurdle	URS	Consultant
Randy Farris	Farris Construction	Arborist
David Tsao	BP	Tech Specialist – Tech Committee Chair
Elizabeth Holden	Liskow & Lewis	Intern
Bob Holden	Liskow & Lewis	Attorney for PRP
Kristi Trail	Shell	Sr. Engineer
Cheryl Warren	URS	Contractors
Cristina Radu	EA	Technical Contact
Lane Andress	EA	Subcontractor to EPA

Attachment 3

Site Survey Forms

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY		
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627	
Location: Livingston Parish, Louisiana	**Date:** 5/19/10	
Contact Made By:		
Name: Katrina Higgins-Coltrain	**Title:** Remedial Project Manager	**Organization:** U.S. EPA
Telephone No.: 214-665-8143 **E-Mail:** Coltrain.Katrina@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Brian Yost	**Title:** Project Manager	**Organization:** EA Engineering
Telephone No.: (972) 972-315-3922 **E-Mail:** byost@eaest.com	**Street Address:** 405 S. Highway 121, Building C, Suite 100 **City, State, Zip:** Lewisville, Texas 75067	
Individual Contacted:		
Name: [redacted]	**Title:** Resident	**Organization:** Not applicable
Telephone No.: [redacted] **E-Mail Address:** [redacted]	**Street Address:** [redacted] **City, State, Zip:** Denham Springs, LA 70726	

Survey Questions

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the first five-year review for the Combustion, Inc. Superfund Site. The period covered by this five-year review is from February 2006 to the current completion of this review.

1. What is your general impression of the work conducted at the site during this review period?
   Cleaning it up was good, but planting and flowers along the fence was a waste of money. Mr., Thibodeax (LDEQ) and Ms. Higgins-Coltrain explained the purpose of the trees as the site remedy, as many people who live now in the neighborhood are new and not familiar with what was done.

2. What effect have site operations had on the surrounding community during this review period?
   Positive effect, everything is the way it should be.

3. During this review period, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.
   Nothing.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** 5/19/10

Survey Questions (Continued)

4. Are you aware of any events, incidents, or activities at the site during this review period such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.
No – hasn't noticed anything different; they are happy it's cleaned up.

5. Do you feel well informed about the site's activities and progress?
Yes they get things in the mail from LDEQ all the time.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
Not pertaining to this.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY		
Site Name: Combustion Inc. Superfund Site		**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana		**Date:** 6/3/2010
Contact Made By:		
Name: Katrina Higgins-Coltrain	**Title:** Remedial Project Manager	**Organization:** U.S. EPA
Telephone No.: 214-665-8143 **E-Mail:** Coltrain.Katrina@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Brian Yost	**Title:** Project Manager	**Organization:** EA Engineering
Telephone No.: (972) 972-315-3922 **E-Mail:** byost@eaest.com	**Street Address:** 405 S. Highway 121, Building C, Suite 100 **City, State, Zip:** Lewisville, Texas 75067	
Individual Contacted:		
Name: James E. Durbin	**Title:** Mayor	**Organization:** City of Denham Springs
Telephone No.: (225) 665-8181 **E-Mail Address:** jimmydurbin@bellsouth.net	**Street Address:** 941 Government **City, State, Zip:** Denham Spring, LA 70726	
Survey Questions		

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the first five-year review for the Combustion, Inc. Superfund Site. The period covered by this five-year review is from February 2006 to the current completion of this review.

1. What is your general impression of the work conducted at the site during this review period?

Appropriate. Tour of Tree plantings AMAZING

2. What effect have site operations had on the surrounding community during this review period?

None

3. During this review period, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.

None

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** 6/3/2010

Survey Questions (Continued)

4. Are you aware of any events, incidents, or activities at the site during this review period such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.

None

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

None

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY		
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627	
Location: Livingston Parish, Louisiana	**Date:** 5/19/10	
Contact Made By:		
Name: Katrina Higgins-Coltrain	**Title:** Remedial Project Manager	**Organization:** U.S. EPA
Telephone No.: 214-665-8143 **E-Mail:** Coltrain.Katrina@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Brian Yost	**Title:** Project Manager	**Organization:** EA Engineering
Telephone No.: (972) 315-3922 **E-Mail:** byost@eaest.com	**Street Address:** 405 S. Highway 121, Building C, Suite 100 **City, State, Zip:** Lewisville, Texas 75067	
Individual Contacted:		
Name: [redacted]	**Title:** Resident	**Organization:** Not applicable
Telephone No.: [redacted] **E-Mail Address:**	**Street Address:** [redacted]. **City, State, Zip:** Denham Springs, LA 70726	

Survey Questions

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the first five-year review for the Combustion, Inc. Superfund Site. The period covered by this five-year review is from February 2006 to the current completion of this review.

1. What is your general impression of the work conducted at the site during this review period?
   As long as it is taking the contamination, it is good. Mr. Thibodeaux (LDEQ) explained a little how the remedy worked progress made.

2. What effect have site operations had on the surrounding community during this review period?
   It did for a while but they did something about it; no current impact.

3. During this review period, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.
   No.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** 5/19/10

Survey Questions (Continued)

4. Are you aware of any events, incidents, or activities at the site during this review period such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.
   No. There is some vandalism and theft but not related to the site.

5. Do you feel well informed about the site's activities and progress?
   No, but he is not concerned with the site.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
   Keep the grass cut, they do pretty good.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY		
Site Name: Combustion Inc. Superfund Site		**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana		**Date:** 5/19/10
Contact Made By:		
Name: Katrina Higgins-Coltrain	**Title:** Remedial Project Manager	**Organization:** U.S. EPA
Telephone No.: 214-665-8143 **E-Mail:** Coltrain.Katrina@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Brian Yost	**Title:** Project Manager	**Organization:** EA Engineering
Telephone No.: (972) 972-315-3922 **E-Mail:** byost@eaest.com	**Street Address:** 405 S. Highway 121, Building C, Suite 100 **City, State, Zip:** Lewisville, Texas 75067	
Individual Contacted:		
Name: [redacted]	**Title:** Resident	**Organization:** Not applicable
Telephone No.: **E-Mail Address:**	**Street Address:** [redacted]e **City, State, Zip:** Denham Springs, LA 70726	

Survey Questions

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the first five-year review for the Combustion, Inc. Superfund Site. The period covered by this five-year review is from February 2006 to the current completion of this review.

1. What is your general impression of the work conducted at the site during this review period?
   It's been fine.

2. What effect have site operations had on the surrounding community during this review period?
   He hasn't noticed any.

3. During this review period, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.
   No.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** 5/19/10

Survey Questions (Continued)

4. Are you aware of any events, incidents, or activities at the site during this review period such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.
He hasn't seen anything.

5. Do you feel well informed about the site's activities and progress?
Pretty well.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
No, everything seems to be going well, nothing disturbing going on.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY		
Site Name: Combustion Inc. Superfund Site		**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana		**Date:** 5/19/10
Contact Made By:		
Name: Katrina Higgins-Coltrain	**Title:** Remedial Project Manager	**Organization:** U.S. EPA
Telephone No.: 214-665-8143 **E-Mail:** Coltrain.Katrina@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Brian Yost	**Title:** Project Manager	**Organization:** EA Engineering
Telephone No.: 972-315-3922 **E-Mail:** byost@eaest.com	**Street Address:** 405 S. Highway 121, Building C, Suite 100 **City, State, Zip:** Lewisville, Texas 75067	
Individual Contacted:		
Name: [redacted]	**Title:** Resident	**Organization:** Not applicable
Telephone No.: [redacted] **E-Mail Address:** [redacted]	**Street Address:** [redacted] **City, State, Zip:** Denham Springs, LA 70726	

Survey Questions

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the first five-year review for the Combustion, Inc. Superfund Site. The period covered by this five-year review is from February 2006 to the current completion of this review.

1. What is your general impression of the work conducted at the site during this review period?
   They like that the lawn is mowed & they are keeping it looking nice.

2. What effect have site operations had on the surrounding community during this review period?
   Not really affected by it, new neighbors haven't asked anything about it.

3. During this review period, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.
   No

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** 5/19/10

Survey Questions (Continued)

4. Are you aware of any events, incidents, or activities at the site during this review period such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.
No

5. Do you feel well informed about the site's activities and progress?
This group is the only one we they have seen come talk to them since cleaning up. Mr. Thibodeax (LDEQ) and Ms. Higgins-Coltrain asked if they got the update mailing they said no; Mr., Thibodeax and Ms. Coltrain-Higgins will check their mailing lists.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
No, as long as it stays clean.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY		
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627	
Location: Livingston Parish, Louisiana	**Date:** 7/26/10	
Contact Made By:		
Name: Katrina Higgins-Coltrain	**Title:** Remedial Project Manager	**Organization:** U.S. EPA
Telephone No.: 214-665-8143 **E-Mail:** Coltrain.Katrina@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Brian Yost	**Title:** Project Manager	**Organization:** EA Engineering
Telephone No.: 972-315-3922 **E-Mail:** byost@eaest.com	**Street Address:** 405 S. Highway 121, Building C, Suite 100 **City, State, Zip:** Lewisville, Texas 75067	
Individual Contacted:		
Name: Mike Pisani	**Title:** PRP Project Manager	**Organization:** Mike Pisani and Associates
Telephone No.: 504-582-2468 **E-Mail Address:** m.pisani@ix.netcom.com	**Street Address:** 1430 Energy Centre, 1100 Poydras Street **City, State, Zip:** New Orleans, LA 70163	

Survey Questions

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the first five-year review for the Combustion, Inc. Superfund Site. The period covered by this five-year review is from February 2006 to the current completion of this review.

1. What is your general impression of the work conducted at the site during this review period?

   The work conducted was in conformance with the ROD and approved plans. The Site is well maintained. The groundwater sample results demonstrate declining constituent concentrations in groundwater, declining constituent mass in groundwater and a reduction in plume size. The five year goal for groundwater was achieved in year 3. Results demonstrate the remedy is working. The monitoring program needs to be optimized within the limits of the ROD, and delete activities/cost which provide little to no benefit due to technical limitations of the available methods and the demonstrated proof of remedy with the groundwater data.

2. What effect have site operations had on the surrounding community during this review period?

   Extremely positive; the tree planting and beautification of the site are appreciated by the community. Also, there is less noise and no odors from the site as might be the case with other remedies.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY (continued)	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:**

Survey Questions (Continued)

3. During this review period, are you aware of any community concerns regarding the site or its operation and administration? If so, please provide details.

   None.

4. Are you aware of any events, incidents, or activities at the site during this review period such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.

   In February 2009 there was a report of odor and an observation of discolored water in the surface water in the drainage canal adjacent to the former Pond Area. The report was made by a Livingston Parish contractor removing debris from the drainage canal. Brian Fairburn of Livingston Parish-Homeland Security and OEP as well as LDEQ personnel responded to this report. In follow-up with LDEQ personnel, no significant observations were provided and there are no records in the LDEQ official file for the Combustion, Inc. site concerning this report. Site Project Management representatives also inspected the site after receiving notice from the LDEQ. Sampling records for the drainage ditch were reviewed and constituents were within the risk-based limits at the location of the incident. No further action was directed by LDEQ.

5. Do you feel well informed about the site's activities and progress?

   Records and reports on the site are available to the public online through the LDEQ EDMS.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

   None.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY – REGULATORY AGENCY		
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627	
Location: Livingston Parish, Louisiana	**Date:** 5/19/2010	
Contact Made By:		
Name: Katrina Higgins-Coltrain	**Title:** Remedial Project Manager	**Organization:** U.S. EPA
Telephone No.: 214-665-8143 **E-Mail:** Coltrain.Katrina@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Brian Yost	**Title:** Project Manager	**Organization:** EA Engineering
Telephone No.: (972) 972-315-3922 **E-Mail:** byost@eaest.com	**Street Address:** 405 S. Highway 121, Building C, Suite 100 **City, State, Zip:** Lewisville, Texas 75067	
Individual Contacted:		
Name: Todd Thibodeaux	**Title: Environmental Scientist**	**Organization: LaDEQ**
Telephone No.: 225-219-3212 **E-Mail Address:** Todd.Thibodeaux@la.gov	**Street Address: 602 N Fifth Street** **City, State, Zip: Baton Rouge, La. 70802**	

Survey Questions

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the first five-year review for the Combustion, Inc. Superfund Site. The period covered by this five-year review is from February 2006 to the current completion of this review.

1. What is your overall impression of the work conducted under this project? (general sentiment)

I think the phyto project has been successful in decreasing the contaminant concentrations in groundwater.

2. Have there been any changes in State laws and regulations that may impact the protectiveness of the remedy in place at the site?

No

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY – REGULATORY AGENCY	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** 5/19/2010

3. Please provide information regarding site activities, status, and issues.

4. What is the status of institutional controls? Are site access controls and ordinances in place?

5. Has the actual or projected use of the site changed?

No

6. Are you aware of any complaints being filed for the site or any unusual activities taking place at the site?

No

7. Have there been any routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If, so, please give purpose and results.

Yes. We inspect the site every six months whether there are site activities going on or not

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY – REGULATORY AGENCY	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** 5/19/2010

8. Are you aware of any complaints, violations, or other incidents, or activities related to the site requiring a response by your office during this review period such as vandalism, trespassing, or emergency responses? If so, please provide details.

   No

9. Are you aware of any complaints, violations, or other incidents, or activities related to the site requiring a response by local authorities (such as police, fire department, etc.) during this review period such as vandalism, trespassing, or emergency responses? If so, please provide details.

   No

10. What effect have site operations had on the surrounding community during this review period?

    There appear to be no effects on the community. Several homes have been built near the site.

11. During this review period, have you been made aware of any community concerns regarding the site or its operation and administration? If so, please provide details.

    No

12. Do you have any comments, suggestions, or recommendations regarding this project (i.e. design, construction documents, constructability, management, etc.)?

    No

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY - CONTRACTOR		
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627	
Location: Livingston Parish, Louisiana	**Date:** July 26, 2010	
Contact Made By:		
Name: Katrina Higgins-Coltrain	**Title:** Remedial Project Manager	**Organization:** U.S. EPA
Telephone No.: 214-665-8143 **E-Mail:** Coltrain.Katrina@epamail.epa.gov	**Street Address:** 1455 Ross Avenue, Suite 1200 **City, State, Zip:** Dallas, Texas 75202	
Name: Brian Yost	**Title:** Project Manager	**Organization:** EA Engineering
Telephone No.: 972-315-3922 **E-Mail:** byost@eaest.com	**Street Address:** 405 S. Highway 121, Building C, Suite 100 **City, State, Zip:** Lewisville, Texas 75067	
Individual Contacted:		
Name: Cheryl Warren	**Title:** Project Manager for PRP Contractor	**Organization**: URS Corporation
Telephone No.: 225-922-5780 **E-Mail Address:** cheryl_warren@urscorp.com	**Street Address:** 7389 Florida Blvd, Suite 300 **City, State, Zip:** Baton Rouge, LA 70806	

Survey Questions

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial actions that have been performed at the site. This interview is being conducted as a part of the first five-year review for the Combustion, Inc. Superfund Site. The period covered by this five-year review is from February 2006 to the current completion of this review.

1. What is your overall impression of the project? (general sentiment)

   The project is proceeding well. The contaminant concentrations in the groundwater are decreasing. The phytoremediation tree stands are thriving. There is good communication between the regulatory agencies and the PRP group (representatives and contractors). Overall the Combustion, Inc. Superfund Site project is a success.

2. Is the remedy functioning as expected? How well is the remedy performing?

   The remedy, monitored natural attenuation enhanced with phytoremediation (and with additional hot-spot treatment if needed), is functioning as expected. The remedy is performing very well as evidenced by the decreasing groundwater concentrations (see Question 6 as follows).

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY - CONTRACTOR	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** July 26, 2010

3. Please provide information regarding the progress of the project, including any changes in the design due to field conditions.

   The phytoremediation project is progressing well. The 2010 growing season is not complete. However in 2009, phytoremediation tree stands B, C, F and G were calculated to have uptaken 3.4 million gallons of groundwater. This was a 41% increase over the 2008 groundwater uptake calculated.

   No changes to the phytoremediation tree stand design have been required due to field conditions. The diverse selection of tree species is creating a natural forest effect and annual leaf litter is minimizing the mowing required under the tree canopies. Drainage of standing storm water from Tree Stand F was improved by diversion ditches.

4. Have any problems been encountered which required, or will require, changes to the remedial design or the Record of Decision for this site?

   No changes to the remedial design or Record of Decision have been required as a result of problems encountered at the site. Post Hurricane Gustav repairs were very effective in saving the phytoremediation tree stands.

5. Have any problems or difficulties been encountered which have impacted construction progress or ability to implement the remedy?

   None other than Hurricane Gustav in September 2008. Post Hurricane Gustav repairs were very effective in saving the phytoremediation tree stands.

6. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

   Process Area: The upper water-bearing zone groundwater has been sampled semiannually. Site-specific contaminants include chlorinated volatiles, aromatic amines, and gasoline components (primarily benzene). ROD-required calculations of geometric mean concentrations of 1,2-dichloroethane (EDC) and 2,4 and/or 2,6-toluenediamine (TDA) exhibit significant decreases. Breakdown daughter product accumulation is observed within the EDC and TDA plumes.

   Process Area: The lower water-bearing zone groundwater was sampled in 2010. There were few reported constituents in the groundwater. The concentrations that were reported were below the Louisiana Risk Evaluation/Correct Action Program (RECAP) Screening Option or Management Option 1 (MO-1) standards.

   Pond Area: The Pond Area Zone 1 groundwater and Zone 2 groundwater were sampled in 2010. The reported constituent concentrations meet Louisiana RECAP Screening Option or Management Option 1 (MO-1) standards.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY - CONTRACTOR	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** July 26, 2010

7. Have any revisions to the Operation & Maintenance (O&M) Manual, the Health and Safety Plan, or the Contingency Plan been necessary during the last five years? If so, please provide information why these changes were necessary.

   The PRPs recently requested that the site arborist become a sub-consultant for URS Corporation. Previously he was working through Mike Pisani and Associates. As result of the change in URS' scope of work, the URS Health and Safety Plan was amended to include the activities of the site arborist.

8. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is no continuous on-site presence, describe staff and frequency of site inspections and activities

   The site arborist is currently employed during the growing season (March to November) to monitor the phytoremediation tree stands. He is on a retainer and uses his professional judgment about the frequency of his tree inspections. The tree maintenance schedule is dictated by seasonal weather patterns and infestations of pests, if any.

   The contractor's site manager is on site weekly per RCRA requirements during the maximum 180-day temporary storage period for a small quantity generator when purge water generated during sampling of the monitor wells characterized as hazardous waste is awaiting transportation and disposal (typically April , May, October and November). During the mowing season (April through October), there are twice-monthly inspections of the site properties in addition to providing oversight for the grass cutting crew. Inspections are also conducted twice a month during the period of November through March solely to evaluate conditions at the site. While at the site, the site manager inspects both the former Process Area and former Pond Area and adjacent Combustion Group-owned properties. Action items are noted and forwarded to the project management team for assignment to the appropriate persons.

   The contractor's field sampling team (typically consisting of a scientist and field technician) is onsite during the spring (April) and fall (October) groundwater sampling events and during other periods to support ROD-required sampling and monitoring activities.

9. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines during the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impact.

   No significant changes. Following Hurricane Gustav there were immediate needs to upright and stake numerous semi-fallen trees. However, once this man-power intensive operation was complete, the site arborist returned to providing care for the tree stands. The sampling routines and maintenance schedule (such as mowing) has remained relative constant throughout this first five-year period.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY - CONTRACTOR	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** July 26, 2010

10. Have there been O&M problems or difficulties at the site during the last five years? Has cost been affected by those situations? If so, please provide detail.

    With the exception of Hurricane Gustav, there have been no O&M problems or difficulties. The effect of Hurricane Gustav seems to have been overcome for the most part. The tree stands are thriving, and the groundwater concentrations are decreasing.

11. Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

    The monitoring and sampling efforts for the first five-year review period were very extensive and expensive for the PRPs to implement. These efforts also did not consistently produce useful data for evaluating the remedy. Going forward, the PRPs will submit a revised Field Sampling Plan (FSP) to address the sampling program for Remedy Years 6 through 10. The revised FSP will be submitted in time for review and approval prior to the April 2011 sampling event and concurrent phytoremediation tree stand growing season. The revised FSP will include all specific tasks required by the ROD (no ROD amendment required) but will incorporate more cost effective, yet suitable methods for accomplishing these ROD-required tasks, where appropriate.

12. Are you aware of any events, incidents, or activities at the site during this review period such as vandalism, trespassing, or emergency responses from local authorities? If so, please provide details.

    In February 2009 there was a report of odor and an observation of discolored water in the surface water in the drainage canal adjacent to the former Pond Area. The report was made by a Livingston Parish contractor removing debris from the drainage canal. Brian Fairburn of Livingston Parish-Homeland Security and OEP as well as LDEQ personnel responded this report. In follow-up with LDEQ personnel, no significant observations were provided and there are no records in the LDEQ official file for the Combustion, Inc. site concerning this report. Site Project Management representatives also inspected the site after receiving notice from the LDEQ. Sampling records for the drainage ditch were reviewed and constituents were within the risk-based limits at the location of the incident. No further action was directed by LDEQ.

13. Do you feel well informed about the site's activities and progress that is not directly related to your activities?

    Yes. The LDEQ and EPA site representatives are very good about communicating with the PRP group and its representatives.

SUPERFUND FIVE-YEAR REVIEW SITE SURVEY - CONTRACTOR	
Site Name: Combustion Inc. Superfund Site	**EPA ID No.:** LAD072606627
Location: Livingston Parish, Louisiana	**Date:** July 26, 2010

14. What effect have site operations had on the surrounding community during this review period?

    Extremely positive; the tree planting and beautification of the site are appreciated by the community. Also, there is less noise and no odors from the site as might be the case with other remedies.

15. During this review period, have you been made aware of any community concerns regarding the site or its operation and administration? If so, please provide details.

    No.

16. Do you have any comments, suggestions, or recommendations regarding this project (i.e. design, construction documents, constructability, management, regulatory agencies, etc.)?

    Going forward the emphasis should be the evaluation of concentrations of site-related COCs in the groundwater. The tree stands are well established, and the groundwater concentrations are decreasing; thus extensive monitoring of the trees should be less important during this next five-year period.

17. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

    As discussed above, an appropriate ROD-compliant scaled-back monitoring and reporting program will be proposed for the next five-year period.

Attachment 4

Site Inspection Photographs

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 1 Site: Combustion, Inc. Superfund Site
Description: Tree Stand A.
Date: May 20, 2010 Direction: N

Photograph No. 2 Site: Combustion, Inc. Superfund Site
Description: Tree Stand A; leaning eucalyptus tree showing effects of hurricane.
Date: May 20, 2010 Direction: NNE

Photograph No. 3 Site: Combustion, Inc. Superfund Site
Description: Photograph taken in same location in Tree Stand A, in opposite direction from Photograph 2.
Date: May 20, 2010 Direction: SSW

Photograph No. 4 Site: Combustion, Inc. Superfund Site
Description: Former Process Area and entry gate into Tree Stand B.
Date: May 20, 2010 Direction: NE

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 5 Site: Combustion, Inc. Superfund Site
Description: Former Process area and Tree Stand B. Looking towards Milton Road. Monitoring well PW-2 in foreground.
Date: May 20, 2010 Direction: N

Photograph No. 6 Site: Combustion, Inc. Superfund Site
Description: Tree Stand B. Piezometers PW-1 and PW-1S. Milton Road beyond fence.
Date: May 20, 2010 Direction: NE

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 7 Site: Combustion, Inc. Superfund Site
Description: Piezometers PW-1 and PW-1S. Looking along a row of trees in Stand B
Irrigation line visible.
Date: May 20, 2010 Direction: ENE

Photograph No. 8 Site: Combustion, Inc. Superfund Site
Description: Lines of irrigation system located in Tree Stand B.
Date: May 20, 2010 Direction: S

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 9 Site: Combustion, Inc. Superfund Site
Description: Entry gate into former Process Area and Tree Stand B.
Date: May 20, 2010 Direction: S

Photograph No. 10 Site: Combustion, Inc. Superfund Site
Description: Stump from tree in Stand B which was damaged in a hurricane. See Photograph 19.
Date: May 20, 2010 Direction: not applicable

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 11 Site: Combustion, Inc. Superfund Site
Description: Piezometer PW-03 and south-southwest corner of site fence around former Process Area.
Date: May 20, 2010 Direction: SSW

Photograph No. 12 Site: Combustion, Inc. Superfund Site
Description: On site weather station to collect real-time data used for calculating sap flow measurements.
Date: May 20, 2010 Direction: NW

Photograph No. 13 Site: Combustion, Inc. Superfund Site
Description: Sap flow monitoring station.
Date: May 20, 2010 Direction:SSE

Photograph No. 14 Site: Combustion, Inc. Superfund Site
Description: Storage shed for temporary storage of purge water from monitoring wells pending analysis.
Date: May 20, 2010 Direction: S

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 15 Site: Combustion, Inc. Superfund Site
Description: Tree Stand C.
Date: May 20, 2010 Direction: NE

Photograph No. 16 Site: Combustion, Inc. Superfund Site
Description: Former location of boiler house and several buried underground storage tanks. Monitoring well MW-201 visible.
Date: May 20, 2010 Direction: N

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 17 Site: Combustion, Inc. Superfund Site
Description: Tree Stand C, showing former Tank 21 area. Piezometer PW-05 visible in foreground.
Date: May 20, 2010 Direction: NE

Photograph No. 18 Site: Combustion, Inc. Superfund Site
Description: Entry gate to 'Darby Field' which is the location of Tree Stands D and F. Tree Stand D visible. This is the location of the Control Area in the 2001 planting event.
Date: May 20, 2010 Direction: NE

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 19 Site: Combustion, Inc. Superfund Site
Description: Poplars and eucalyptus trees in Stand D. Note tree stumps from trees damaged in hurricanes are rebounding with new growth.
Date: May 20, 2010 Direction: NE

Photograph No. 20 Site: Combustion, Inc. Superfund Site
Description: Tree Stand F, trees are approximately 4 years old.
Date: May 20, 2010 Direction: S

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 21 Site: Combustion, Inc. Superfund Site
Description: Northeast boundary of Combustion, Inc. site.
Date: May 20, 2010 Direction: NE

Photograph No. 22 Site: Combustion, Inc. Superfund Site
Description: Crawfish 'chimneys' are visible in several wet grassy areas of site.
Date: May 20, 2010 Direction: unk

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 23 Site: Combustion, Inc. Superfund Site
Description: Yellow bollards for monitoring well MW-209S visible in upper left of photo.
Date: May 20, 2010 Direction: SE

Photograph No. 24 Site: Combustion, Inc. Superfund Site
Description: Monitoring well MW-213S.
Date: May 20, 2010 Direction: SE

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 25 Site: Combustion, Inc. Superfund Site
Description: Standing water on site, higher than groundwater table. Source of water is precipitation ponding.
Date: May 20, 2010 Direction: S

Photograph No. 26 Site: Combustion, Inc. Superfund Site
Description: Nested wells MW-205S and MW-205D.
Date: May 20, 2010 Direction: NW

Photograph No. 27 Site: Combustion, Inc. Superfund Site
Description: Close up of identification tag on monitoring well MW-205D
Date: May 20, 2010 Direction: not applicable

Photograph No. 28 Site: Combustion, Inc. Superfund Site
Description: Tree Stand G, planted approximately 3 years ago. Irrigation lines visible.
Date: May 20, 2010 Direction: S

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 29 Site: Combustion, Inc. Superfund Site
Description: Piezometer PW-12.
Date: May 20, 2010 Direction: SE

Photograph No. 30 Site: Combustion, Inc. Superfund Site
Description: Southwestern portion of Combustion, Inc. site. Note wooden bridge over small ditch leading to the surface drainage.
Date: May 20, 2010 Direction: SW

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 31 Site: Combustion, Inc. Superfund Site
Description: Effluent from off-site mobile home park that discharges onto the corner of the Combustion, Inc. site property. Burgess Road and mobile home visible.
Date: May 20, 2010 Direction: W

Photograph No. 32 Site: Combustion, Inc. Superfund Site
Description: Close-up of effluent stream from mobile home park crossing corner of Site.
Date: May 20, 2010 Direction: N

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 33 Site: Combustion, Inc. Superfund Site
Description: Southwest field and Combustion, Inc. property boundary. Burgess Road on right of photo.
Date: May 20, 2010 Direction: SW

Photograph No. 34 Site: Combustion, Inc. Superfund Site
Description: Western property boundary of Combustion, Inc. along Burgess Road, visible on left.
Date: May 20, 2010 Direction: N

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 35 Site: Combustion, Inc. Superfund Site
Description: Gate to road that leads to Pond Area.
Date: May 20, 2010 Direction: N

Photograph No. 36 Site: Combustion, Inc. Superfund Site
Description: Brush and debris pile by entry to the Pond Area.
Date: May 20, 2010 Direction: NE

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 37 Site: Combustion, Inc. Superfund Site
Description: Fence line of southern boundary of Pond Area.
Date: May 20, 2010 Direction: E

Photograph No. 38 Site: Combustion, Inc. Superfund Site
Description: Entry gate into Pond Area
Date: May 20, 2010 Direction: NE

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 39 Site: Combustion, Inc. Superfund Site
Description: Fence line of western boundary of Pond Area.
Date: May 20, 2010 Direction: NNE

Photograph No. 40 Site: Combustion, Inc. Superfund Site
Description: Monitoring well MW-4 in standing water.
Date: May 20, 2010 Direction: S

Site Inspection Photographs
Combustion, Inc. Superfund Site First Five-Year Review

Photograph No. 41 Site: Combustion, Inc. Superfund Site
Description: Tree Stand E, located on north side of Milton road, in foreground.
Date: May 20, 2010 Direction: WNW

Attachment 5

Public Notice for Initiation of Five-Year Review

Combustion Inc. Superfund Site
PUBLIC NOTICE
U.S. EPA Region 6 Begins
Five-Year Review of Site Remedy

The U.S. Environmental Protection Agency Region 6 (EPA), in coordination with the Louisiana Department of Environmental Quality, has begun a Five-Year Review of the remedy for the Combustion Inc. Superfund Site, located in Denham Springs, Livingston Parish, Louisiana. The review will evaluate the implementation and performance of the remedy in order to determine protectiveness of public health and the environment. Once completed, the results of the Five-Year Review will be made available to the public at the following information repositories:

Livingston Parish Library
8101 Hwy. 190
Denham Springs, LA 70726
(225) 665-8118

U.S. EPA Region 6 Library
1445 Ross Avenue
Dallas, TX 75202
(214) 665-2792

Louisiana Department of Environmental Quality
Public Records Center
Galvez Building, Room 127
602 N. Fifth Street
Baton Rouge, LA 70802
(225) 219-3168
Fax (225) 219-3175
e-mail: publicrecords@deq.state.la.us
http://www.deq.state.la.us/pubrecords
Contact: Debbie Goutro

Information about the Site also is available on the Internet at www.epa.gov/region6/superfund. For more information about the Site contact:

U.S. EPA Region 6
Katrina Higgins-Coltrain
(214) 665-8143 or
1-800-533-3508 (toll-free)
e-mail: coltrain.katrina@epa.gov

Louisiana Department of Environmental Quality
Todd Thibodeaux, LDEQ Project Manager
(225) 219-3225
Fax (225) 219-3219
e-mail: Todd.Thibodeaux@la.gov

STATE OF LOUISIANA PARISH OF LIVINGSTON

Combustion Inc. Superfund Site
PUBLIC NOTICE
U.S. EPA Region 6 Begins
Five-Year Review of Site Remedy

The U.S. Environmental Protection Agency Region 6 (EPA), in coordination with the Louisiana Department of Environmental Quality, has begun a Five-Year Review of the remedy for the Combustion Inc. Superfund Site located in Denham Springs, Livingston Parish, Louisiana. The review will evaluate the implementation and performance of the remedy in order to determine protectiveness of public health and the environment. Once completed, the results of the Five-Year Review will be made available to the public at the following information repositories:

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8101 Hwy 190
Denham Springs, LA 70726
(225) 665-8118

U.S. EPA Region 6 Library
1445 Ross Avenue
Dallas, TX 75202
(214) 665-7992

Louisiana Department of Environmental Quality
Public Records Center
Galvez Building, Room 127
602 N. Fifth Street
Baton Rouge, LA 70802
(225) 219-3168
Fax (225) 219-3175
e-mail: publicrecords@deq.state.la.us
http://www.deq.state.la.us/pubrecords
Contact: Debbie Gouiro

Information about the Site also is available on the Internet at www.epa.gov/region6/superfund
For more information about the Site contact:

U.S. EPA Region 6
Katrina Higgins-Coltrain
(214) 665-8143 or
1-800-533-3508 (toll-free)
e-mail: coltrain.katrina@epa.gov

Louisiana Department of Environmental Quality
Todd Thibodeaux, LDEQ Project Manager
(225) 219-3225
Fax (225) 219-3219
e-mail: Todd.Thibodeaux@la.gov

Before me, the undersigned authority, personally came and appeared Cheryl Gilbert

who, being duly sworn, deposes and says: That she is an agent of the Livingston Parish News, a newspaper published Sunday and Thursday in Denham Springs, Louisiana.

That the hereto attached advertisement for U.S. Env. Combustion Inc.

was published in said newspaper in it's issues dated: May 2, 2010

Sworn and subscribed before me in Denham Springs, Louisiana, on this 3rd day of June

A.D. 2010

Jeff McHugh David, Notary Public
Notary ID No. 042404

The Livingston Parish News

Serving Livingston Parish since 1898

Attachment 6

Institutional Controls – Covenants for Restrictions on Use

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608509

Type of Document : Conveyances - General

Book : 934 **Page :** 902

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937790006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 902
File Number 608509

Deputy Clerk

Return To :

CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in LDEQ's Risk Evaluation/Corrective Action Program (RECAP), October 20, 2003, Section 2.9. In accordance with LAC 33:I, Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI shall be reevaluated to determine if conditions are appropriate for the proposed land use.

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract A on Exhibit 2, attached hereto.
- The property has been the subject of a CERCLA response;
- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;
- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;
- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;
- Disturbing or moving these features of the remedy may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws; and
- The property may be subject to restrictions under LAC 33:V. Chapter 35.

Additional information on site conditions may be obtained through the Louisiana Department of Environmental Quality and/or the United States Environmental Protection Agency (see above description and reference numbers). The information contained herein places prospective purchasers on notice of conditions that may be present on the Property. This Conveyance Notice does not relieve a prospective purchaser from undertaking its own review and investigation of conditions on the Property.

COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 12th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torrell

_____
Print Name: Robert E. Holden

_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain lot or parcel of ground, together with all the buildings and improvements thereon, situated in the Parish of Livingston, State of Louisiana in that subdivision thereof, known as DUBOSE SUBDIVISION, SECOND FILING, according to a plat of said subdivision made by Alex Theriot, Jr., C.E. and Surveyor, dated 2nd day of November, 1977, and designated thereon as LOT NUMBER THIRTY-SIX (36), said lot having such dimensions and being subject to all such servitudes and restrictions as are of record, and as shown on said subdivision plat, which said plat is recorded in the official records of Livingston Parish, at Plat Book Number 12, Entry Number 133762.

EXHIBIT 2

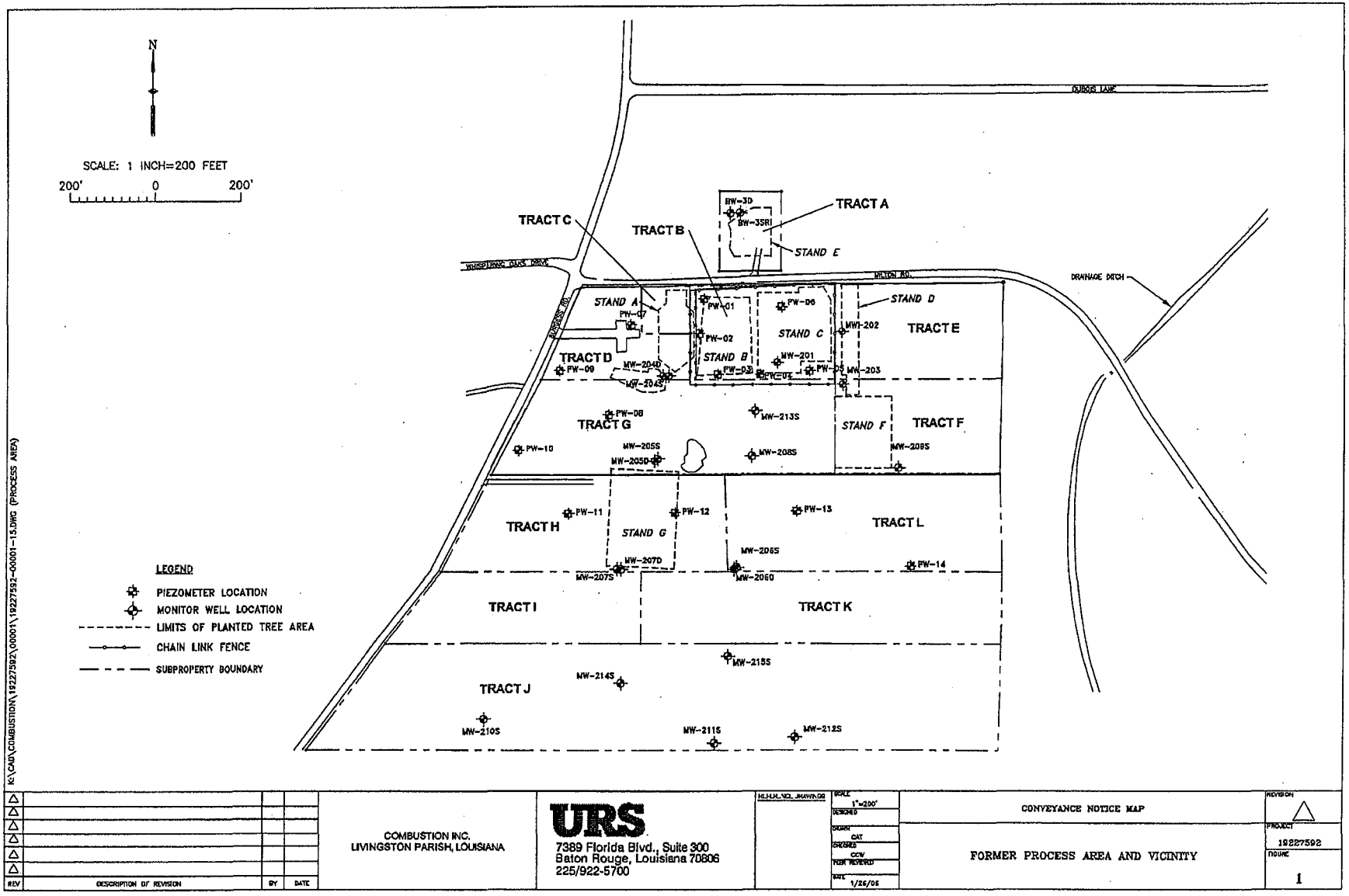

N
SCALE: 1 INCH=200 FEET
200' 0 200'
DUBOIS LANE
WHISPERING OAKS DRIVE
WILTON RD.
DRAINAGE DITCH
TRACT A
TRACT B
TRACT C
TRACT D
TRACT E
TRACT F
TRACT G
TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
BW-3D
BW-3SR
PW-01
PW-02
PW-03
PW-04
PW-05
PW-06
PW-07
PW-08
PW-09
PW-10
PW-11
PW-12
PW-13
PW-14
MW-201
MW-202
MW-203
MW-204D
MW-204S
MW-205D
MW-205S
MW-206D
MW-206S
MW-207D
MW-207S
MW-208S
MW-209S
MW-210S
MW-211S
MW-212S
MW-213S
MW-214S
MW-215S
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\000011\19227592-000011-15.DWG (PROCESS AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
SCALE 1"=200'
DESIGNED
DRAWN CAT
CHECKED
QCW
PEER REVIEWED
DATE 1/26/06
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
REVISION
PROJECT 19227592
FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

Constituent	Remedial Standard (mg/L)
2,4/2,6 Toluenediamine	0.01
O and/or P Toluidine	0.01
1,1,2-Trichloroethane	0.005
1,1-Dichloroethane	0.749
1,1-Dichloroethene	0.006
1,2-Dichloroethane	0.005
Acetone	0.564
Benzene	0.005
Chloroethane	0.028
cis-1,2-Dichloroethene	0.518
Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

621603_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608510

Type of Document : Conveyances - General

Book : 934 **Page :** 908

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937800006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 908
File Number 608510

Deputy Clerk

Return To :

Do not Detach this Recording Page from Original Document

CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in LDEQ's Risk Evaluation/Corrective Action Program (RECAP), October 20, 2003, Section 2.9. In accordance with LAC 33:I, Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI shall be reevaluated to determine if conditions are appropriate for the proposed land use.

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract A on Exhibit 2, attached hereto.

- The property has been the subject of a CERCLA response;

- Hazardous substances remain at specified locations on the Property above levels that allow for unrestricted exposure, specifically, this Property is restricted to future commercial/industrial use only;

- Hazardous substances may remain at specific locations in the groundwater above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;

- Disturbing or moving soil, and disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;

- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;

- Disturbing or moving these features of the remedy may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws; and

- The property may be subject to restrictions under LAC 33:V. Chapter 35.

Additional information on site conditions may be obtained through the Louisiana Department of Environmental Quality and/or the United States Environmental Protection Agency (see above description and reference numbers). The information contained herein places prospective purchasers on notice of conditions that may be present on the Property. This Conveyance Notice does not relieve a prospective purchaser from undertaking its own review and investigation of conditions on the Property.

COMBUSTION, INC. SITE REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc.
Site Remediation Group, L.L.C.

Signed in my presence on the 12th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torroll

_____
Print Name: Robert E. Holden

_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain 6.28 acre tract of land located in Section 22, Township 6 South, Range 3 East, G.L.D., Parish of Livingston, State of Louisiana, and being more particularly described as follows, to-wit: For point of beginning, begin at the northeast corner of the southwest quarter of the northeast quarter of Section 22, Township 6 South, Range 3 East, and run South 0° 32' 34" West 655.84 feet; thence north 89° 49' West 544.55 feet; thence north 23° 16' East 497.62 feet; thence north 13° 51' East 116.56 feet; thence north 8° 8' East 95.70 feet; thence south 89° 49' East 312.87 feet to point of beginning, all according to a plat of survey by Alex Theriot, Jr., Registered C.E., and Surveyor, dated November 30, 1977, a copy of which is on file and of record in the office of the Clerk and Recorder of Livingston Parish.

EXHIBIT 2

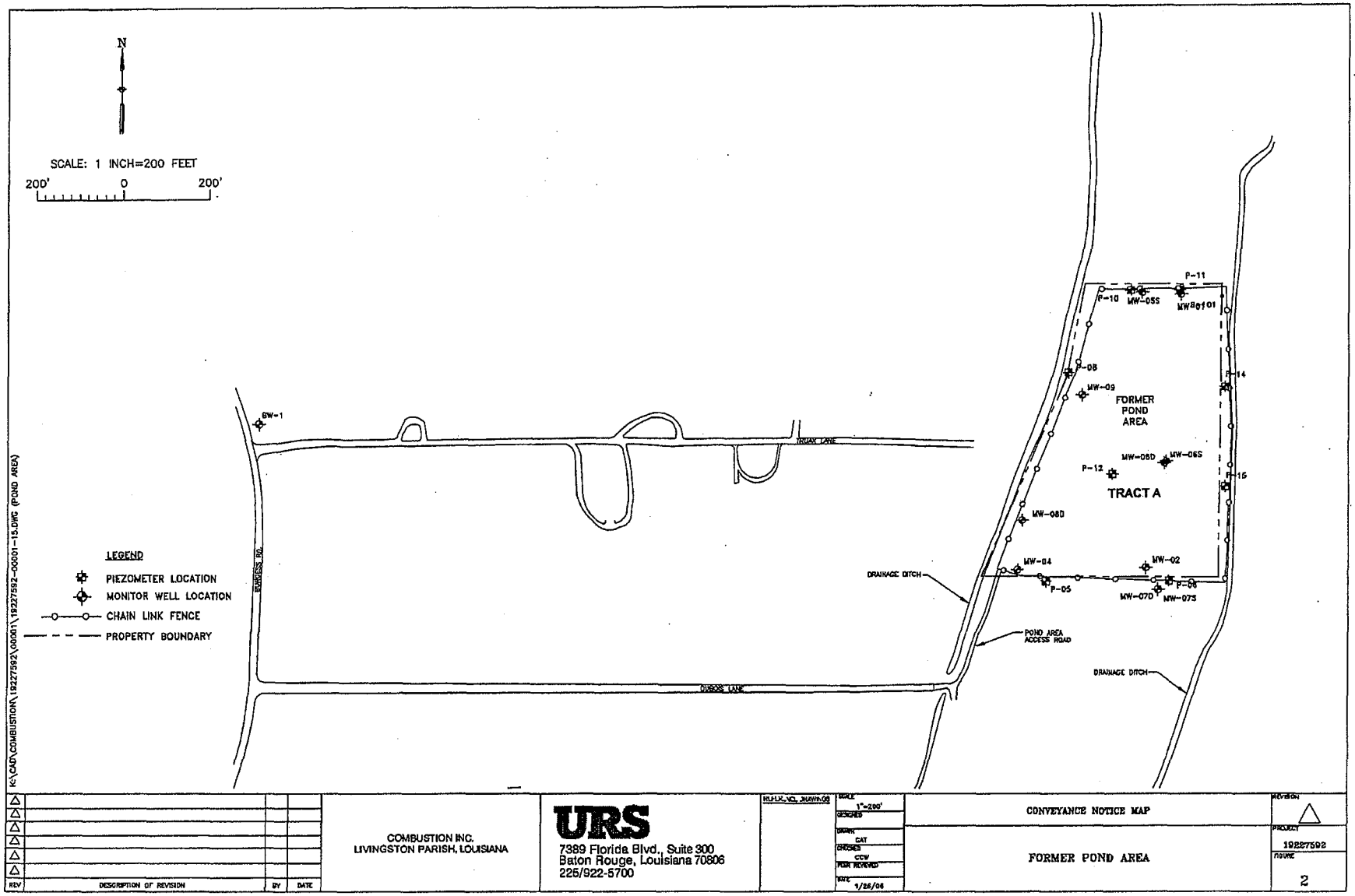

N
SCALE: 1 INCH=200 FEET
200' 0 200'
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
CHAIN LINK FENCE
PROPERTY BOUNDARY
BW-1
P-11
P-10
MW-05S
MW-05D
P-08
MW-09
FORMER POND AREA
P-14
MW-06D
MW-06S
P-12
TRACT A
P-15
MW-08D
MW-04
MW-02
P-05
P-06
MW-07D
MW-07S
DRAINAGE DITCH
POND AREA ACCESS ROAD
DRAINAGE DITCH
TRUAX LANE
DUBOIS LANE
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (POND AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
SCALE 1"=200'
DESIGNED
DRAWN CAT
CHECKED CDW
PEER REVIEWED
DATE 9/26/06
CONVEYANCE NOTICE MAP
FORMER POND AREA
REVISION
PROJECT 19227592
FIGURE 2

EXHIBIT 3

SOIL CLEANUP CRITERIA
PHASE II REMOVAL ACTION
POND AREA
Table 3-3

Constituent	Soil Standard (mg/kg)
Benzene	200
Benzo(a)pyrene	1.0
Chlorobenzene	40,000
1,1-Dichloroethane	200,000
1,2-Dichloroethane	63
1,2-Dichloroethene	20,000
1,4-Dichlorobenzene	240
Ethylbenzene	200,000
Lead	500
Polychlorinated Biphenyls	10
Styrene	190
Tetrachloroethene	112
Toluene	400,000
Trichloroethene	520

621596_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608511

Type of Document : Conveyances - General

Book : 934 **Page :** 914

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937810006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 914
File Number 608511

Deputy Clerk

Return To :

Do not Detach this Recording Page from Original Document

CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in LDEQ's Risk Evaluation/Corrective Action Program (RECAP), October 20, 2003, Section 2.9. In accordance with LAC 33:I, Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI shall be reevaluated to determine if conditions are appropriate for the proposed land use.

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract C on Exhibit 2, attached hereto.

- The property has been the subject of a CERCLA response;

- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;

- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;

- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;

- Disturbing or moving these features of the remedy may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws; and

- The property may be subject to restrictions under LAC 33:V. Chapter 35.

Additional information on site conditions may be obtained through the Louisiana Department of Environmental Quality and/or the United States Environmental Protection Agency (see above description and reference numbers). The information contained herein places prospective purchasers on notice of conditions that may be present on the Property. This Conveyance Notice does not relieve a prospective purchaser from undertaking its own review and investigation of conditions on the Property.

COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 24th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torrell

_____
Print Name: Robert E. Holden

_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

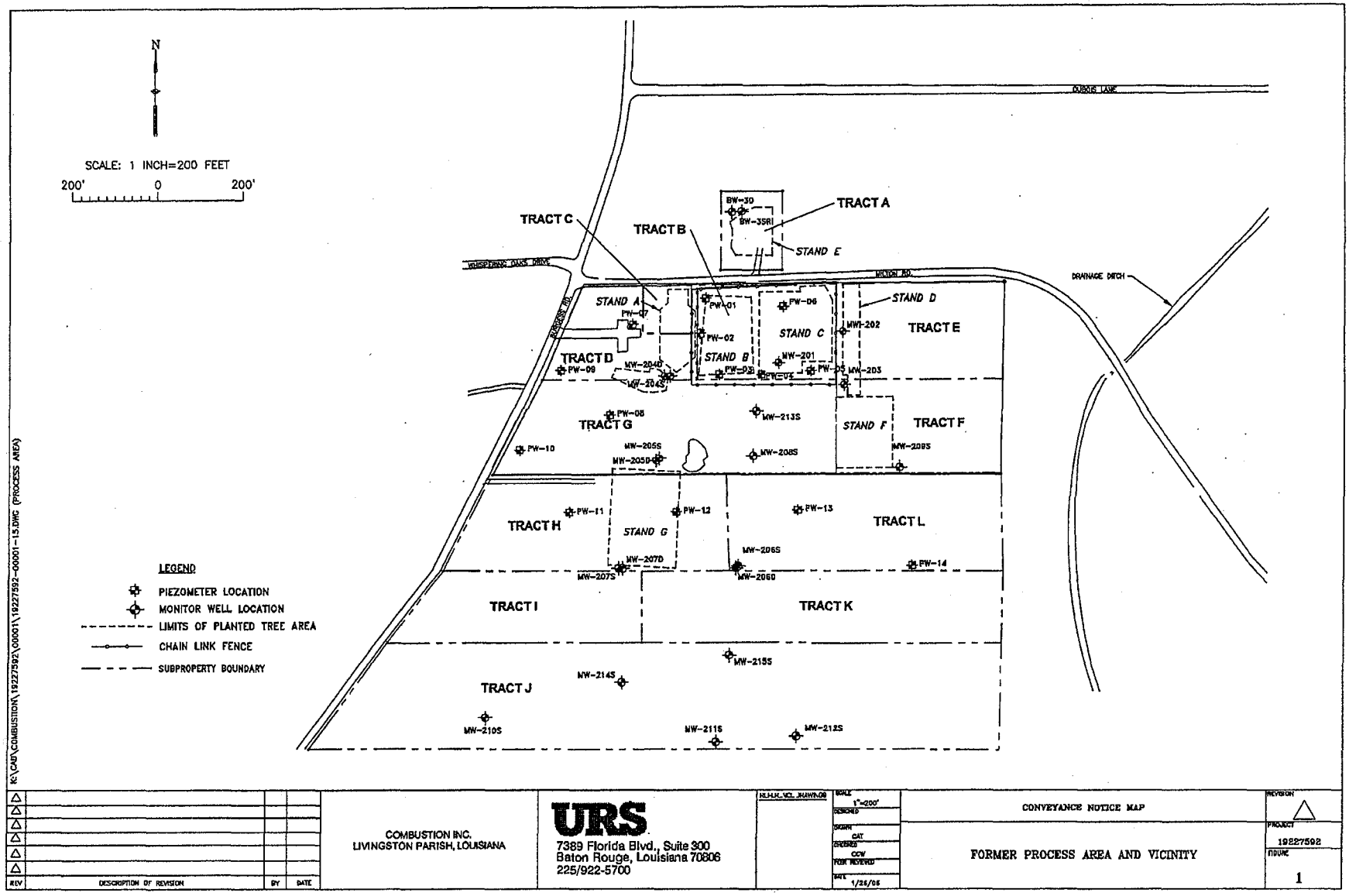
EXHIBIT 1

That certain tract or parcel of ground, together with all buildings and improvements thereon, situated in Section 22, Township 6 South, Range 3 East, G.L.D., Livingston Parish, Louisiana, containing 0.29 acres of land and being more particularly described as follows, to wit: For a starting point begin where the South line of Lot-1 intersects the East margin of Arnold or Burgess Road, all as per survey for Suit No. 19,687 by Philip G. Holland, L.S., dated November 7, 1970 and revised June 14, 1971; thence run North 23 deg. 29 min. East 237.68 feet to point and corner; thence run South 89 deg. 58 min. 35 sec. East 142.81 feet to the point of beginning; thence run South 89 deg. 58 min. 35 sec. East 112.38 feet to point and corner; thence run South 112.99 feet to point and corner; thence run North 89 deg. 26 min. 01 sec. West 113.22 feet to point and corner; thence run North 00 deg. 25 min. 41 sec. East 111.92 feet back to the point of beginning, being more particularly described as TRACT B on plat of survey made by Alex Theriot, Jr., and Associates, Inc., C.E., and Surveyors, dated May 27, 1988.

Being the same property acquired by David Earl Slack, et ux, from Elgen Thornton, Jr., et ux, by Act of Cash Sale dated November 3, 1994, as recorded in Conveyance Book 649, page 37, Entry Number 341,654, and by vendors herein from David Earl Slack, et ux, by Act of Cash Sale dated April 25, 1996, in Conveyance Book 681, page 56, Entry Number 363666, of the Livingston Parish Conveyance Records.

The municipal number or address of this property is: 30789 Milton, Denham Springs, Louisiana 70726.

EXHIBIT 2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SCALE: 1 INCH=200 FEET
200' 0 200'
TRACT A
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TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
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MW-215S
DUBOIS LANE
WHISPERING OAKS DRIVE
PARKER RD.
MILTON RD.
DRAINAGE DITCH
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
1"=200'
CAT
CCW
1/26/06
19227592
1
REV
DESCRIPTION OF REVISION
BY
DATE

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

Constituent	Remedial Standard (mg/L)
2,4/2,6 Toluenediamine	0.01
O and/or P Toluidine	0.01
1,1,2-Trichloroethane	0.005
1,1-Dichloroethane	0.749
1,1-Dichloroethene	0.006
1,2-Dichloroethane	0.005
Acetone	0.564
Benzene	0.005
Chloroethane	0.028
cis-1,2-Dichloroethene	0.518
Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610737_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608512

Type of Document : Conveyances - General

Book : 934 **Page :** 920

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937820006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 920
File Number 608512

Deputy Clerk

Return To :

CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in LDEQ's Risk Evaluation/Corrective Action Program (RECAP), October 20, 2003, Section 2.9. In accordance with LAC 33:I, Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI shall be reevaluated to determine if conditions are appropriate for the proposed land use.

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract D on Exhibit 2, attached hereto.

- The property has been the subject of a CERCLA response;

- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;

- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;

- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;

- Disturbing or moving these features of the remedy may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws; and

- The property may be subject to restrictions under LAC 33:V. Chapter 35.

Additional information on site conditions may be obtained through the Louisiana Department of Environmental Quality and/or the United States Environmental Protection Agency (see above description and reference numbers). The information contained herein places prospective purchasers on notice of conditions that may be present on the Property. This Conveyance Notice does not relieve a prospective purchaser from undertaking its own review and investigation of conditions on the Property.

COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 12th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torrell

_____
Print Name: Robert E Holden

_____
NOTARY PUBLIC

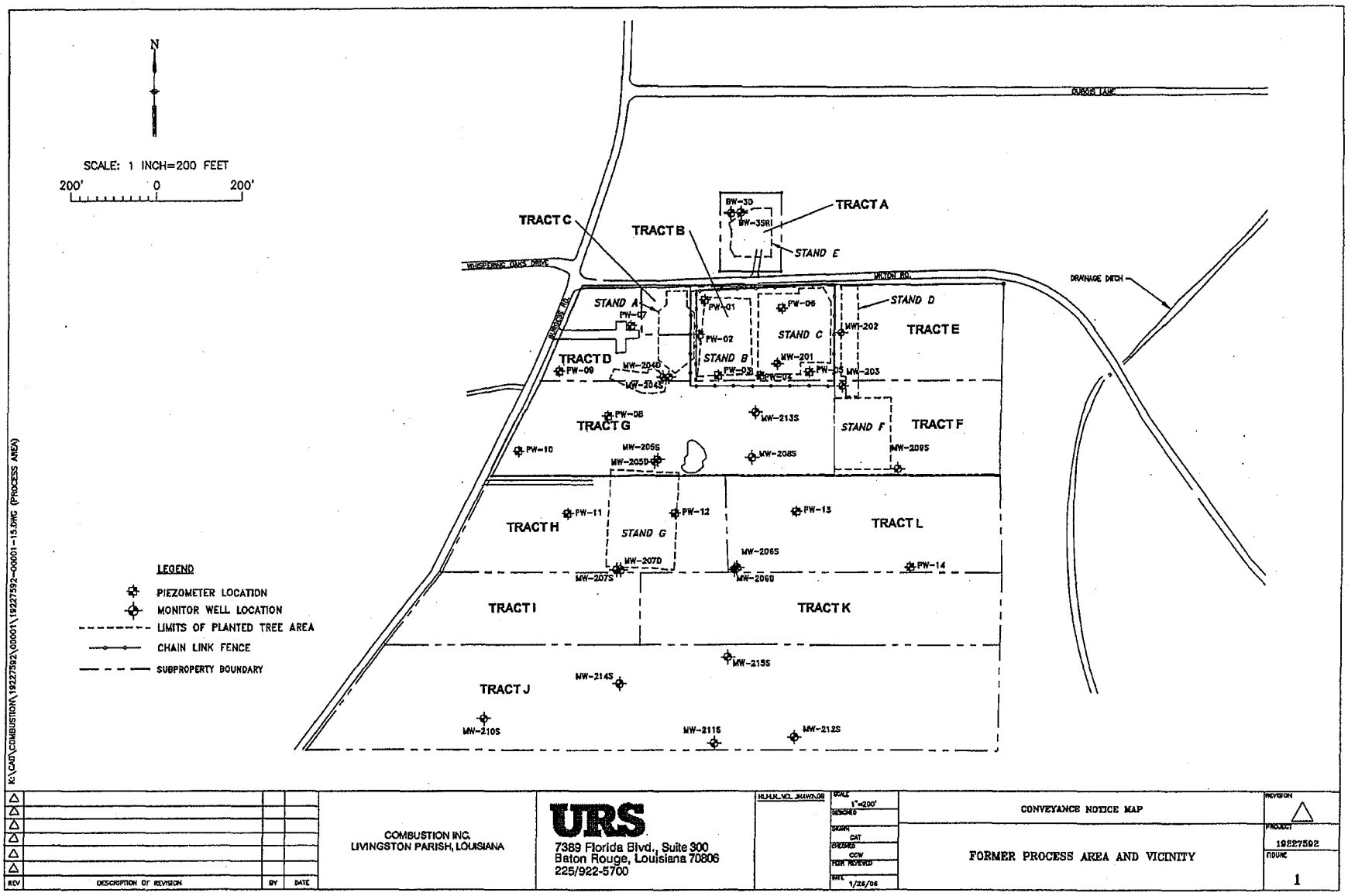
LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

One (1) certain tract or parcel of ground, together with all the buildings and improvements thereon, and all the rights, ways, privileges, servitudes, appurtenances, and advantages thereunto belonging or in anywise appertaining, situated in the Parish of Livingston, State of Louisiana, in Section 22, T6S-R3E, G.L.D., and being more particularly described according to a plat of survey entitled "Survey Map for Bedco Enterprises, Inc., showing certain tracts of land located in Section 22, T6S-R3E, G.L.D., Parish of Livingston, State of Louisiana," dated May 27, 1988, by Alex Theriot, Jr., & Associates, Inc., Engineers, Land Surveyor, Denham Springs, Louisiana, designated as TRACT "A," containing 1.23 acres as shown on said map, a copy of which is on file and of record in COB 531, Page 87, official records of Livingston Parish, Louisiana.

Said property being subject to any and all valid restrictions, servitudes, mineral conveyances and/or reservations affecting same, if any; and that Right-of-Way, Access and Use Agreement dated December 19, 1994, in favor of the State of Louisiana, Department of Environmental Quality on behalf of Combustion, Inc., of record in COB 659, Page No. 758, official records of Livingston Parish, Louisiana.

EXHIBIT 2


N
SCALE: 1 INCH=200 FEET
200' 0 200'
TRACT A
TRACT B
TRACT C
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TRACT F
TRACT G
TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
DUBOIS LANE
WHISPERING OAKS DRIVE
MILTON RD.
DRAINAGE DITCH
BW-3D
BW-3SRI
PW-01
PW-02
PW-05
PW-06
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MW-201
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MW-204D
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MW-206D
MW-206S
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MW-213S
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MW-215S
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
RUN NO. DRAWING
SCALE 1"=200'
DESIGNED
DRAWN CAT
CHECKED
QCW
FOR REVIEW
DATE 1/26/06
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
REVISION
PROJECT 19227592
FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

Constituent	Remedial Standard (mg/L)
2,4/2,6 Toluenediamine	0.01
O and/or P Toluidine	0.01
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Chloroethane	0.028
cis-1,2-Dichloroethene	0.518
Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610741_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608513

Type of Document : Conveyances - General

Book : 934 **Page :** 926

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937830006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 926
File Number 608513

Deputy Clerk

Return To :

Do not Detach this Recording Page from Original Document

CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in LDEQ's Risk Evaluation/Corrective Action Program (RECAP), October 20, 2003, Section 2.9. In accordance with LAC 33:I, Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI shall be reevaluated to determine if conditions are appropriate for the proposed land use.

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract B on Exhibit 2, attached hereto.

- The property has been the subject of a CERCLA response;

- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;

- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;

- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;

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COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 12th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torrell

_____
Print Name: Robert E Holder

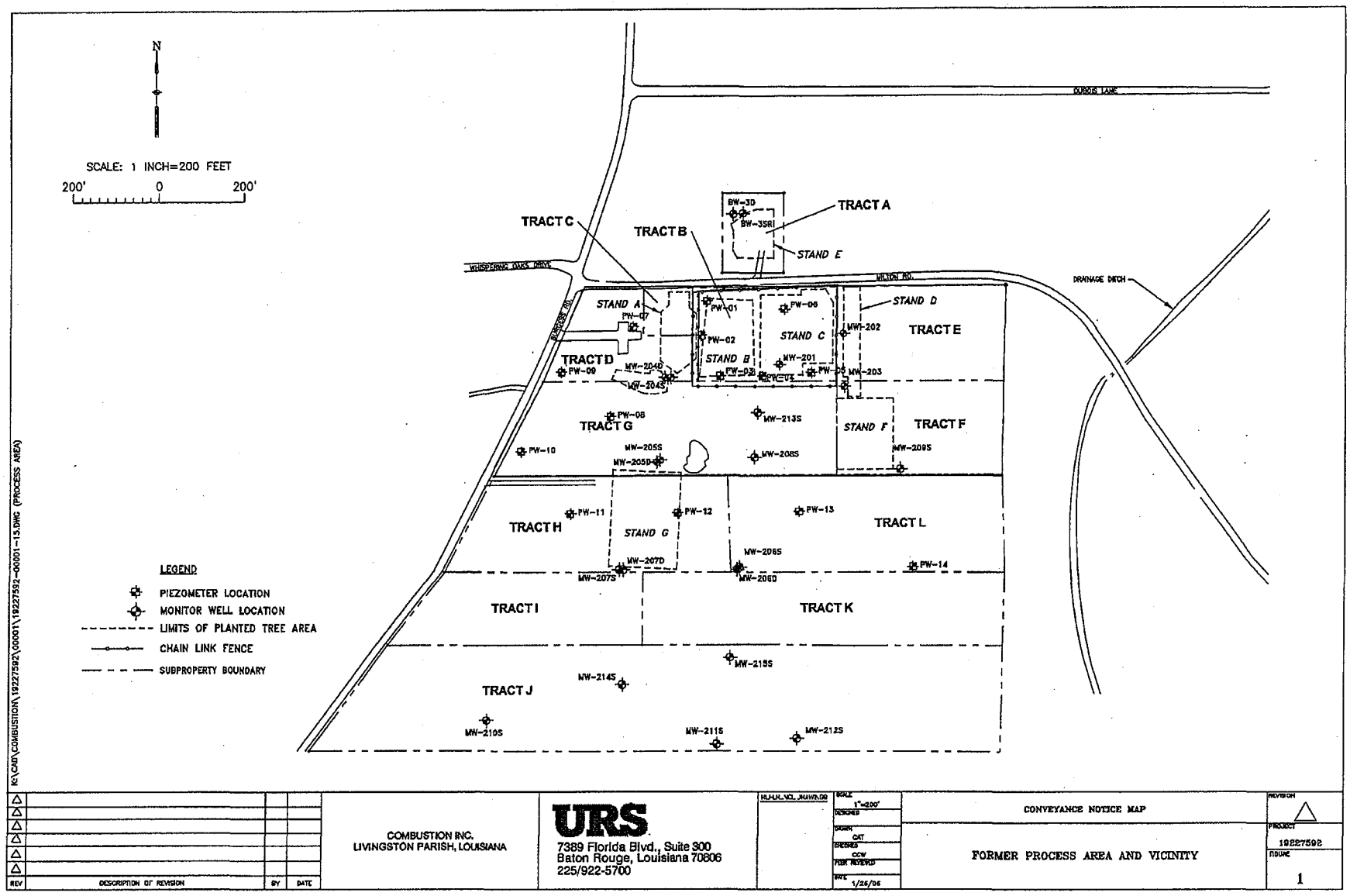
_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain 1.60 acre tract of land located in Section 22, Township 6 South, Range 3 East, G.L.D., Parish of Livingston, State of Louisiana, and being more particularly described as follow, to-wit: Start where the south line of Lot 1 of said Section 22 intersects the east margin of Burgess Road, and run South 23° 29' East 1.09 feet; thence run East 351.38 feet to point of beginning: thence run East 328.18 feet; thence run north 218.9 feet; thence run South 87° 31' West 328.49 feet; thence run South 204.7 feet to point of beginning, all as shown on a plat of survey made by Alex Theriot, Jr., C.E. and Surveyor, dated November 30, 1977, a copy of which is on file and of record in the office of the Clerk and Recorder of Livingston Parish.

EXHIBIT 2


N
SCALE: 1 INCH=200 FEET
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TRACT A
TRACT B
TRACT C
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TRACT E
TRACT F
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TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
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BW-35RI
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DUBOIS LANE
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DRAINAGE DITCH
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
SCALE 1"=200'
DESIGNED
DRAWN CAT
CHECKED CCW
PEER REVIEWED
DATE 1/26/06
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
REVISION
PROJECT 19227592
FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

Constituent	Remedial Standard (mg/L)
2,4/2,6 Toluenediamine	0.01
O and/or P Toluidine	0.01
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Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610736_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608514

Type of Document : Conveyances - General

Book : 934 **Page :** 932

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937840006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 932
File Number 608514

Deputy Clerk

Return To :

Do not Detach this Recording Page from Original Document

CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana De... Quality Agency Interest No. 2941, was closed with contamin... acceptable for industrial/commercial use of the property as ... Evaluation/Corrective Action Program (RECAP), October 20, 200... with LAC 33:I, Chapter 13, if land use changes from industrial to ... party shall notify the LDEQ within 30 days and the AOI shall b... conditions are appropriate for the proposed land use.

2 copies to certify

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract E on Exhibit 2, attached hereto.
- The property has been the subject of a CERCLA response;
- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;
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COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 24th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torrell

_____
Print Name: Robert E. Holden

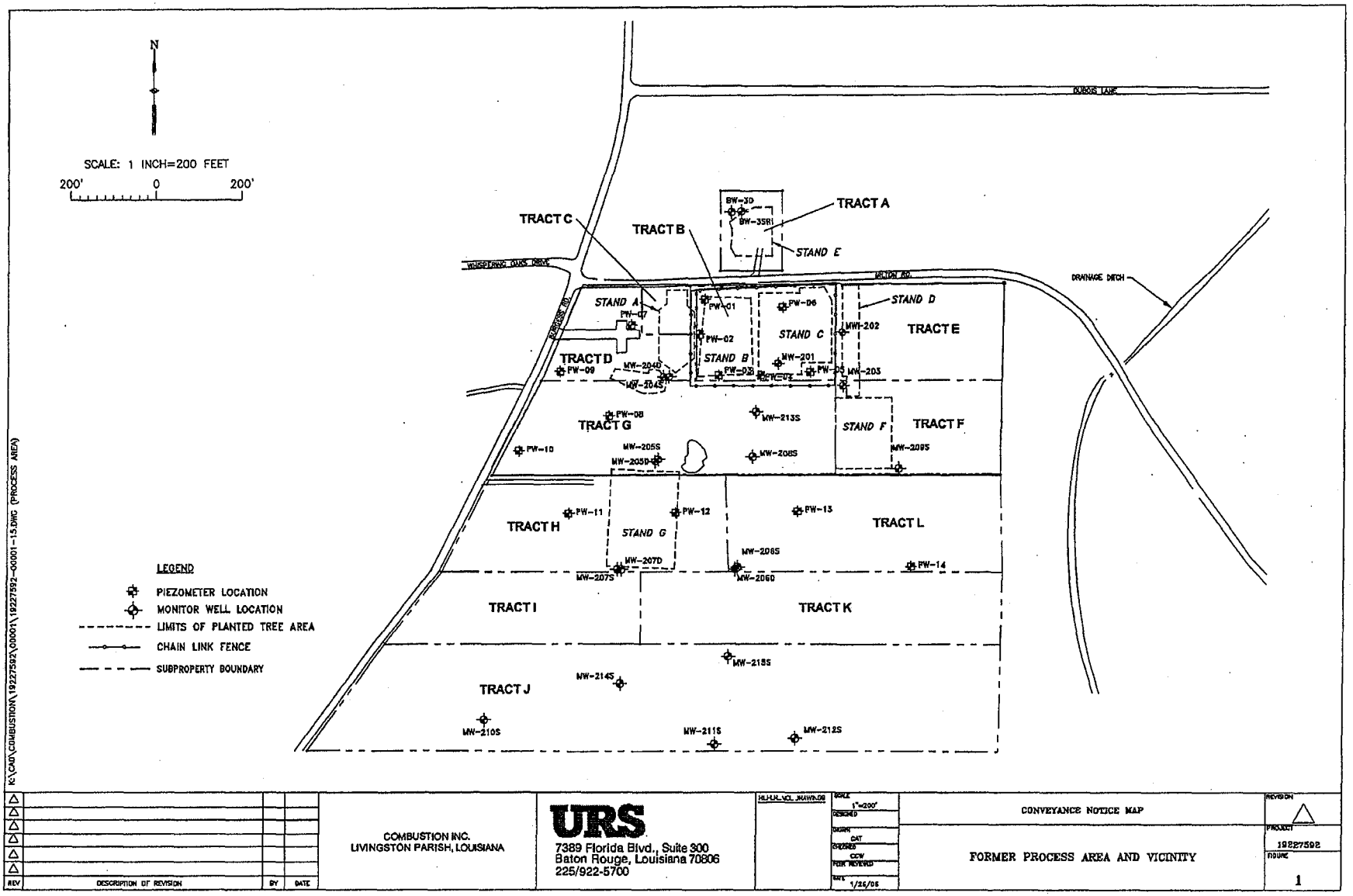
_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain tract or parcel of land containing two (2) acres, together with all the improvements thereon, situated in the Northeast Half (NE1/2) of the Southwest Quarter (SW1/4) of Section 22, T-6-S, R-3-E, Greensburg Land District, Parish of Livingston, State of Louisiana, being the Eastern two (2) acres of Lot No. One (1) of a subdivision of the property of Mrs. S.C. Burgess as per map of survey made by L.Q. Huey, C.E., dated July, 1928, a blueprint of which is of record in Book 45, page 74 of the Conveyance Records of said Livingston Parish, and being a portion of the same property acquired by Harman J. Walker as per deed of record in Book 92, as Entry No. 36,594 and by Mrs. Ollie L. Harris as per deed of record in Book 137, as Entry No. 67,727 of the Conveyance Records of Livingston Parish.

EXHIBIT 2


N
SCALE: 1 INCH=200 FEET
200' 0 200'
DUBOIS LANE
WHISPERING OAKS DRIVE
WILTON RD.
DRAINAGE DITCH
TRACT A
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STAND A
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LEGEND
PIEZOMETER LOCATION
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DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
SCALE 1"=200'
DESIGNED
DRAWN DAT
CHECKED CCW
FIELD REVIEWED
DATE 1/26/06
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
REVISION
PROJECT 19227592
FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

Constituent	Remedial Standard (mg/L)
2,4/2,6 Toluenediamine	0.01
O and/or P Toluidine	0.01
1,1,2-Trichloroethane	0.005
1,1-Dichloroethane	0.749
1,1-Dichloroethene	0.006
1,2-Dichloroethane	0.005
Acetone	0.564
Benzene	0.005
Chloroethane	0.028
cis-1,2-Dichloroethene	0.518
Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610742_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608515

Type of Document : Conveyances - General

Book : 934 **Page :** 938

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937850006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 938
File Number 608515

Deputy Clerk

Return To :

CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contamina
acceptable for industrial/commercial use of the property as d
Evaluation/Corrective Action Program (RECAP), October 20, 2003
with LAC 33:I, Chapter 13, if land use changes from industrial to n
party shall notify the LDEQ within 30 days and the AOI shall be
conditions are appropriate for the proposed land use.

2 copies to certify

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract F on Exhibit 2, attached hereto.
- The property has been the subject of a CERCLA response;
- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;
- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;
- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;
- Disturbing or moving these features of the remedy may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws; and
- The property may be subject to restrictions under LAC 33:V. Chapter 35.

Additional information on site conditions may be obtained through the Louisiana Department of Environmental Quality and/or the United States Environmental Protection Agency (see above description and reference numbers). The information contained herein places prospective purchasers on notice of conditions that may be present on the Property. This Conveyance Notice does not relieve a prospective purchaser from undertaking its own review and investigation of conditions on the Property.

COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 12th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torrell

_____
Print Name: Robert E. Holden

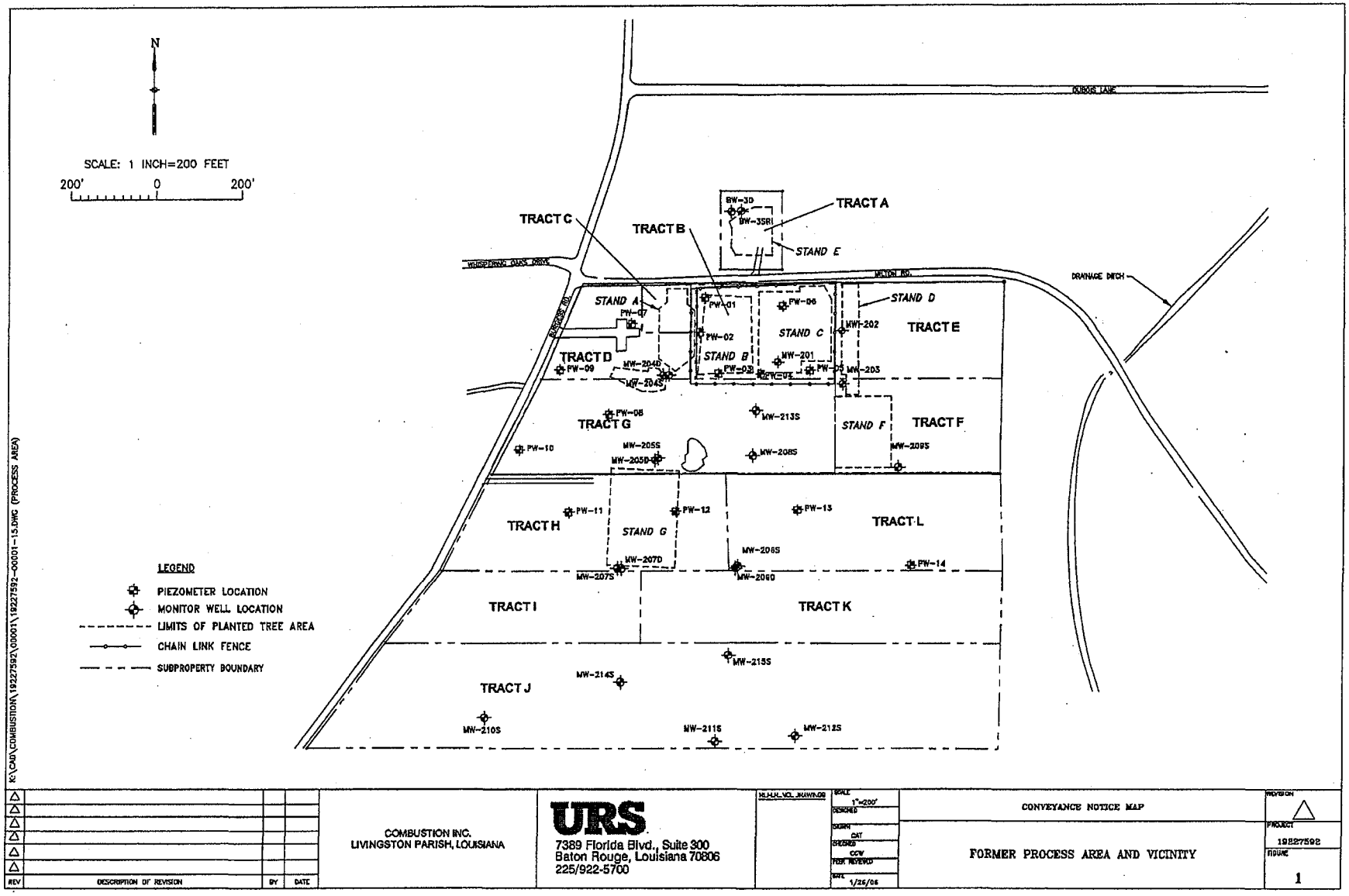
_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain tract or parcel of land containing 1.93 acres, situated in Section 22, Township 6 South, Range 3 East, Parish of Livingston, State of Louisiana, and being the Eastern 1.93 acres of Lot 2 of a subdivision of the property of Mrs. S.C. Burgess as per survey map by L.Q. Huey, C.E., recorded in COB 45, page 74, of the Livingston Parish Conveyance Records, and being more particularly described as follows, to-wit: From the Northwest corner of the Southwest Quarter (SE1/4) of Section 22, Township 6 South, Range 3 East, measure North 89 deg. 11 min. East 2,282.3 feet and corner; thence measure South 0 deg. 49 min. East 240.4 feet to point of beginning. From said point of beginning, measure North 89 deg. 44 min. East 389.70 feet and corner; thence measure South 0 deg. 54 min. West 217.70 feet and corner; thence measure South 89 deg. 45 min. West 383.18 feet and corner; thence measure North 0 deg. 49 min. West 217.55 feet back to the point of beginning, all as per plat and map of said property made by A.W. O'Quinn, Sr., Reg. L.S., dated July 20, 1973, a copy of said plat being on file and of record in the Parish of Livingston.

EXHIBIT 2


N
SCALE: 1 INCH=200 FEET
200' 0 200'
DUBOIS LANE
WHISPERING OAKS DRIVE
WILSON RD.
DRAINAGE DITCH
TRACT A
TRACT B
TRACT C
TRACT D
TRACT E
TRACT F
TRACT G
TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
BW-3D
BW-3SRI
PW-01
PW-02
PW-03
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PW-05
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PW-07
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PW-10
PW-11
PW-12
PW-13
PW-14
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MW-202
MW-203
MW-204D
MW-204S
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MW-205S
MW-206S
MW-207D
MW-207S
MW-208D
MW-208S
MW-209S
MW-210S
MW-211S
MW-212S
MW-213S
MW-214S
MW-215S
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
SCALE 1"=200'
DESIGNED
DRAWN CAT
CHECKED CCV
PEER REVIEWED
DATE 1/25/06
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
REVISION
PROJECT 19227592
FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

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1,2-Dichloroethane	0.005
Acetone	0.564
Benzene	0.005
Chloroethane	0.028
cis-1,2-Dichloroethene	0.518
Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610744_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608516

Type of Document : Conveyances - General

Book : 934 **Page :** 944

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937860006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 944
File Number 608516

Deputy Clerk

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CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in LDEQ's Risk Evaluation/Corrective Action Program (RECAP), October 20, 2003, Section 2.9. In accordance with LAC 33:I, Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI shall be reevaluated to determine if conditions are appropriate for the proposed land use.

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract H on Exhibit 2, attached hereto.

- The property has been the subject of a CERCLA response;

- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;

- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;

- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;

- Disturbing or moving these features of the remedy may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws; and

- The property may be subject to restrictions under LAC 33:V. Chapter 35.

Additional information on site conditions may be obtained through the Louisiana Department of Environmental Quality and/or the United States Environmental Protection Agency (see above description and reference numbers). The information contained herein places prospective purchasers on notice of conditions that may be present on the Property. This Conveyance Notice does not relieve a prospective purchaser from undertaking its own review and investigation of conditions on the Property.

COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 8th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torell

_____
Print Name: Robert G. Holden

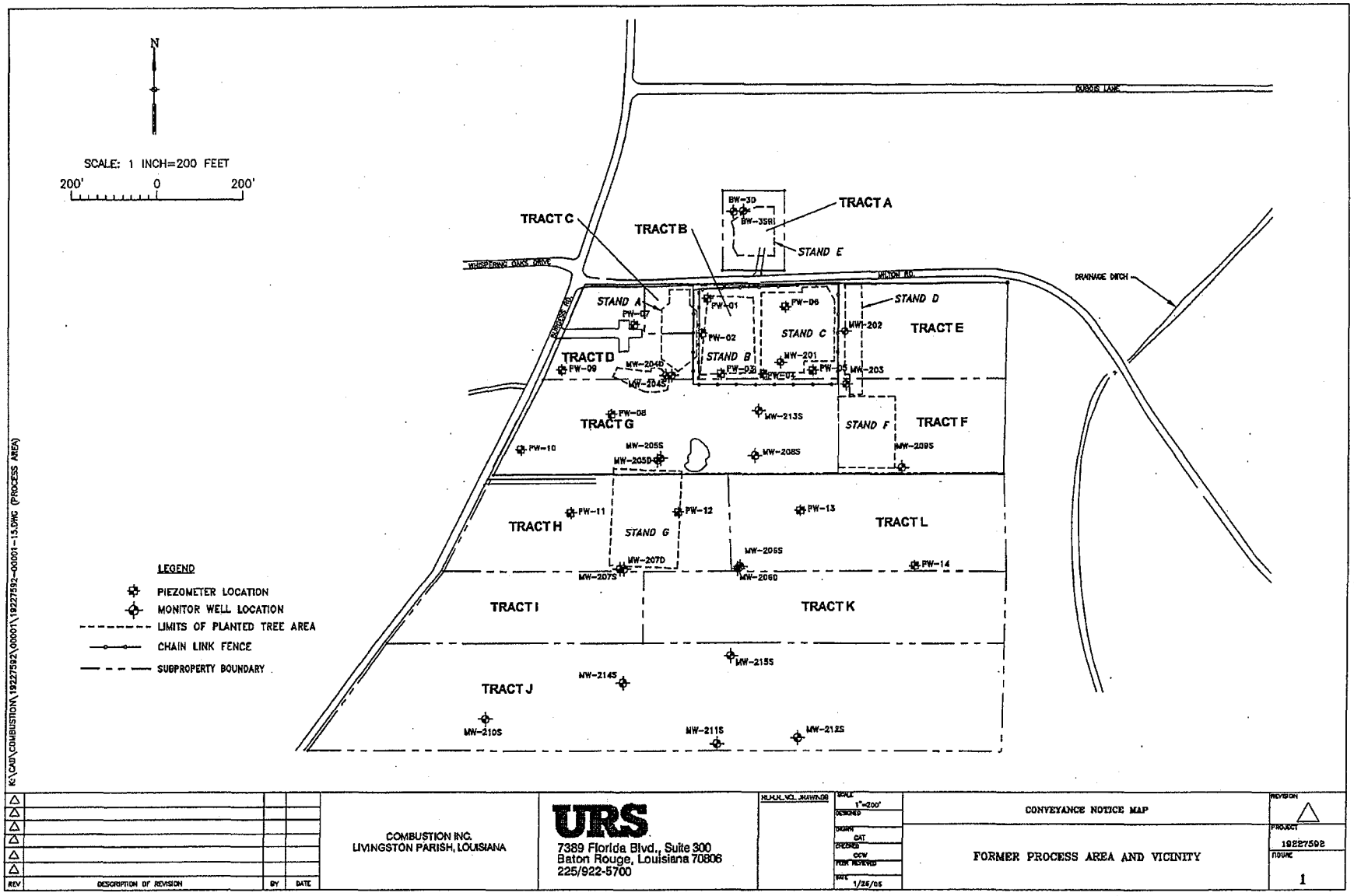
_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain tract or parcel of land, containing 3.00 acres, together with all the buildings and improvements thereon, situated in Section 22, Township 6 South, Range 3 East, in the Parish of Livingston, State of Louisiana, and being described, according to a plat of survey by Alex Theriot, Jr. and Associates, Inc. dated January 21, 1982, said plat made a part hereof by reference, as TRACT "3-A," said tract being described, according to said survey as follows, to-wit: From the Southwest corner of Section 22, Township 6 South, Range 3 East, proceed North 00° 26' 00" East 2,209.9 feet to point and corner; thence South 89° 59' 25" East 1,500.99 feet to POINT OF BEGINNING: from said point of beginning, proceed South 89° 59' 25" East 541.72 feet and corner; thence South 00° 31' 14" East 217.26 feet and corner; thence North 89° 59' 25" West 669.50 feet to point on the Eastern margin of the Burgess Road and corner; thence proceed along the same, North 35° 20' 54" East 73.06 feet; thence North 28° 05' 32" East 141.10 feet; thence North 27° 15' 47" East 37.30 feet back to the point of beginning.

EXHIBIT 2


N
SCALE: 1 INCH=200 FEET
200' 0 200'
DUBOIS LANE
WHISPERING OAKS DRIVE
HILTON RD.
PROCESS RD.
DRAINAGE DITCH
TRACT A
TRACT B
TRACT C
TRACT D
TRACT E
TRACT F
TRACT G
TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
BW-3D
BW-3581
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PW-02
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PW-04
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PW-10
PW-11
PW-12
PW-13
PW-14
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MW-204S
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MW-205S
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MW-206S
MW-207D
MW-207S
MW-208S
MW-209S
MW-210S
MW-211S
MW-212S
MW-213S
MW-214S
MW-215S
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
SCALE 1"=200'
DESIGNED
DRAWN CAT
CHECKED CCW
PEER REVIEWED
DATE 1/25/05
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
REVISION
PROJECT 19227592
FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

Constituent	Remedial Standard (mg/L)
2,4/2,6 Toluenediamine	0.01
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1,1-Dichloroethane	0.749
1,1-Dichloroethene	0.006
1,2-Dichloroethane	0.005
Acetone	0.564
Benzene	0.005
Chloroethane	0.028
cis-1,2-Dichloroethene	0.518
Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610747_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608517

Type of Document : Conveyances - General

Book : 934 **Page :** 950

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937870006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
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Recorded in Book 934 Page 950
File Number 608517

Deputy Clerk

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CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) he ... the following described Area of Investigation (AOI), Louisiana ... tal Quality Agency Interest No. 2941, was closed with conta ... are acceptable for industrial/commercial use of the property ... isk Evaluation/Corrective Action Program (RECAP), October 20, ... nce with LAC 33:I, Chapter 13, if land use changes from industrial ... ible party shall notify the LDEQ within 30 days and the AOI sh ... ıe if conditions are appropriate for the proposed land use.

2 copies to certify

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract I on Exhibit 2, attached hereto.

- The property has been the subject of a CERCLA response;

- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;

- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;

- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;

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COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 12th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torrell

_____
Print Name: Robert E. Holden

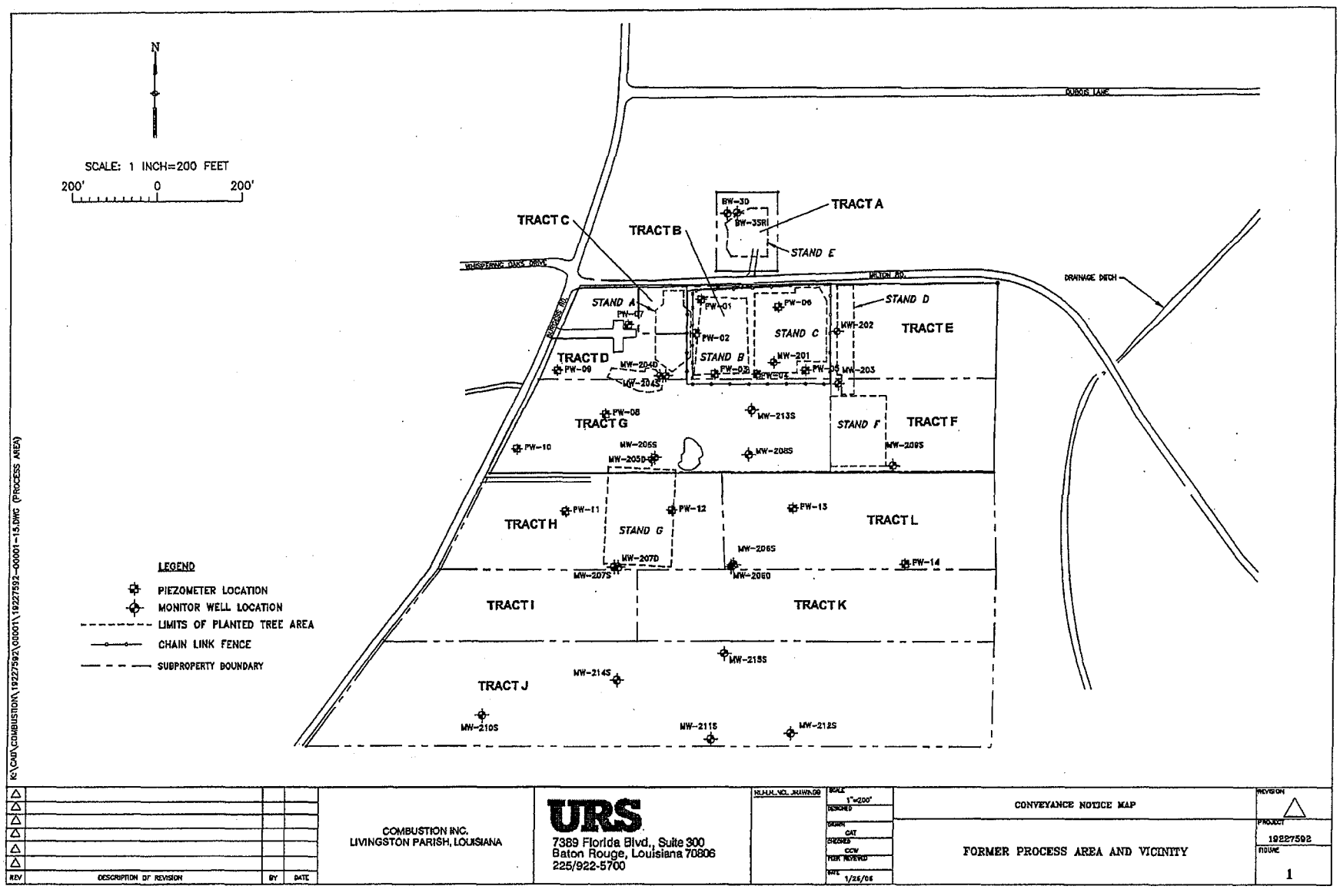
_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

That certain tract of land, containing 2.00 acres, together with all the buildings and improvements thereon, situated in Section 22, Township 6 South, Range 3 East, in the Parish of Livingston, State of Louisiana, and being designated as TRACT "A" on that certain survey by Louis L. Higginbotham, Registered Land Surveyor, dated April 12, 1983, a copy of which is on file and of record in the office of the Clerk and Recorder for said parish and state, said tract being more fully described according to said survey as follows: Start at the Southwest corner of Section 22, T6S, R3E, and run North 00° 26' 00" East 2209.90 feet to point and corner; thence South 89° 59' 25" East 1,500.99 feet to point and corner; thence South 30° 04' 31" West 251.02 feet to POINT OF BEGINNING: From said point of beginning proceed South 89° 59' 25" East 469.81 feet and corner; thence South 00° 00' 35" West 162.81 feet and corner; thence North 89° 59' 25" West 600.39 feet and corner; thence North 38° 44' 26" East 208.71 feet back to point of beginning.

EXHIBIT 2


N
SCALE: 1 INCH=200 FEET
200' 0 200'
DUBOIS LANE
WHISPERING OAKS DRIVE
MILTON RD.
DRAINAGE DITCH
ACCESS RD.
TRACT A
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TRACT F
TRACT G
TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
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LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
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FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

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Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610749_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608518

Type of Document : Conveyances - General

Book : 934 **Page :** 956

Recording Pages : 6

Recorded Information

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On (Recorded Date) : 06/14/2006

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Doc ID - 005937880006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
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File Number 608518

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CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in LDEQ's Risk Evaluation/Corrective Action Program (RECAP), October 20, 2003, Section 2.9. In accordance with LAC 33:I, Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI shall be reevaluated to determine if conditions are appropriate for the proposed land use.

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract K on Exhibit 2, attached hereto.

- The property has been the subject of a CERCLA response;

- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;

- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;

- Monitoring wells necessary for protectiveness of the remedy or for its successful operation and maintenance, remain on the Property at specified locations;

- Disturbing or moving these features of the remedy may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws; and

- The property may be subject to restrictions under LAC 33:V. Chapter 35.

Additional information on site conditions may be obtained through the Louisiana Department of Environmental Quality and/or the United States Environmental Protection Agency (see above description and reference numbers). The information contained herein places prospective purchasers on notice of conditions that may be present on the Property. This Conveyance Notice does not relieve a prospective purchaser from undertaking its own review and investigation of conditions on the Property.

COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 12th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torroll

_____
Print Name: Robert E. Holden

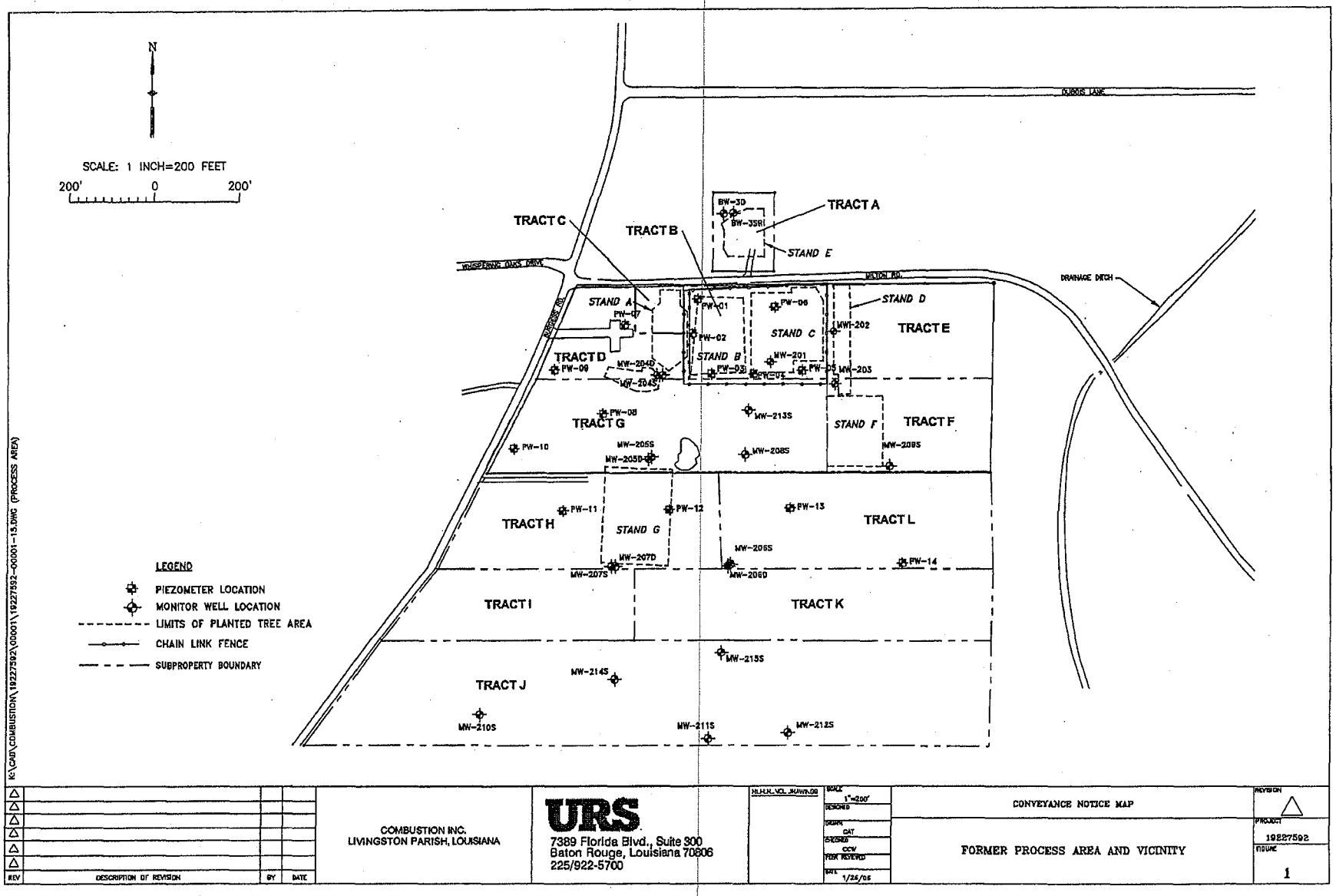
_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain tract or parcel of land, containing 3.11 acres, together with all the buildings and improvements thereon, situated in Section 22, Township 6 South, Range 3 East, in the Parish of Livingston, State of Louisiana, and being described, according to a plat of survey by Louis L. Higginbotham, Registered Land Surveyor, dated May 19, 1983, said plat made a part hereof by reference, as TRACT "B," said tract being described, according to said survey as follows, to-wit: From the Southwest corner of Section 22, Township 6 South, Range 3 East, proceed North 00° 26' 00" East 2,209.9 feet to point and corner; thence South 89° 59' 25" East 1,500.99 feet to point and corner; thence South 30° 04' 31" West 251.02 feet to point and corner; thence South 89° 59' 25" East 469.81 feet to POINT OF BEGINNING: from said point of beginning, proceed South 89° 59' 25" East 831.98 feet and corner; thence South 00° 31' 14" East 162.81 feet and corner; thence North 89° 59' 25" West 831.98 feet and corner; thence North 00° 00' 35" East 162.81 feet back to point of beginning.

EXHIBIT 2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SCALE: 1 INCH=200 FEET
200' 0 200'
DUBOIS LANE
WHISPERING OAKS DRIVE
HILTON RD.
DRAINAGE DITCH
TRACT A
TRACT B
TRACT C
TRACT D
TRACT E
TRACT F
TRACT G
TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
BW-3D
BW-35RI
PW-01
PW-02
PW-03
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PW-13
PW-14
MW-201
MW-202
MW-203
MW-204D
MW-204S
MW-205D
MW-205S
MW-206D
MW-206S
MW-207D
MW-207S
MW-208S
MW-209S
MW-210S
MW-211S
MW-212S
MW-213S
MW-214S
MW-215S
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
SCALE 1"=200'
DESIGNED
DRAWN CAT
CHECKED CCW
PEER REVIEWED
DATE 1/26/06
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
PROJECT 19227592
FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

Constituent	Remedial Standard (mg/L)
2,4/2,6 Toluenediamine	0.01
O and/or P Toluidine	0.01
1,1,2-Trichloroethane	0.005
1,1-Dichloroethane	0.749
1,1-Dichloroethene	0.006
1,2-Dichloroethane	0.005
Acetone	0.564
Benzene	0.005
Chloroethane	0.028
cis-1,2-Dichloroethene	0.518
Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610755_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608519

Type of Document : Conveyances - General

Book : 934 **Page :** 962

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937890006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 962
File Number 608519

Deputy Clerk

Return To :

CONVEYANCE NOTIFICATION

The Louisiana Department of Environmental Quality (LDEQ) hereby notifies the public that the following described Area of Investigation (AOI), Louisiana Department of Environmental Quality Agency Interest No. 2941, was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in LDEQ's Risk Evaluation/Corrective Action Program (RECAP), October 20, 2003, Section 2.9. In accordance with LAC 33:I, Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI shall be reevaluated to determine if conditions are appropriate for the proposed land use.

PLEASE TAKE NOTICE THAT: Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*; the National Oil and Hazardous Substances Contingency Plan ("NCP"), 40 C.F.R. Part 300; the Louisiana Environmental Quality Act ("LEQA"), La. Rev. Stat. Ann. Title 30, Subtitle II, Chapters 10 and 12; and the Record of Decision dated April 2004 for the Combustion, Inc. Superfund site, LDEQ AI No. 2941, EPA ID No. LAD072606627, Site ID No. 0600472 ("ROD") (available at the Louisiana Department of Environmental Quality ("LDEQ") file room, 602 N. Fifth Street, First Floor, Baton Rouge, LA 70802), Combustion Inc. Site Remediation Group, LLC, hereby notifies the public that:

- The property described in Exhibit 1, attached hereto, (hereinafter referred to as "the Property") is the subject of a response action under CERCLA. The general location of the Property is shown as Tract J on Exhibit 2, attached hereto.

- The property has been the subject of a CERCLA response;

- Hazardous substances remain in the groundwater at specific locations to a depth of approximately 30 feet below ground surface above levels that allow for unrestricted exposure, and the Property remains subject to clean-up standards as shown on Exhibit 3, attached hereto;

- Disturbing or removing groundwater may pose a threat to human health or the environment, and may subject the property owner and the party causing the disturbance to liability under CERCLA or other laws;

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Additional information on site conditions may be obtained through the Louisiana Department of Environmental Quality and/or the United States Environmental Protection Agency (see above description and reference numbers). The information contained herein places prospective purchasers on notice of conditions that may be present on the Property. This Conveyance Notice does not relieve a prospective purchaser from undertaking its own review and investigation of conditions on the Property.

COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 12th day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torrell

_____
Print Name: Robert E. Holden

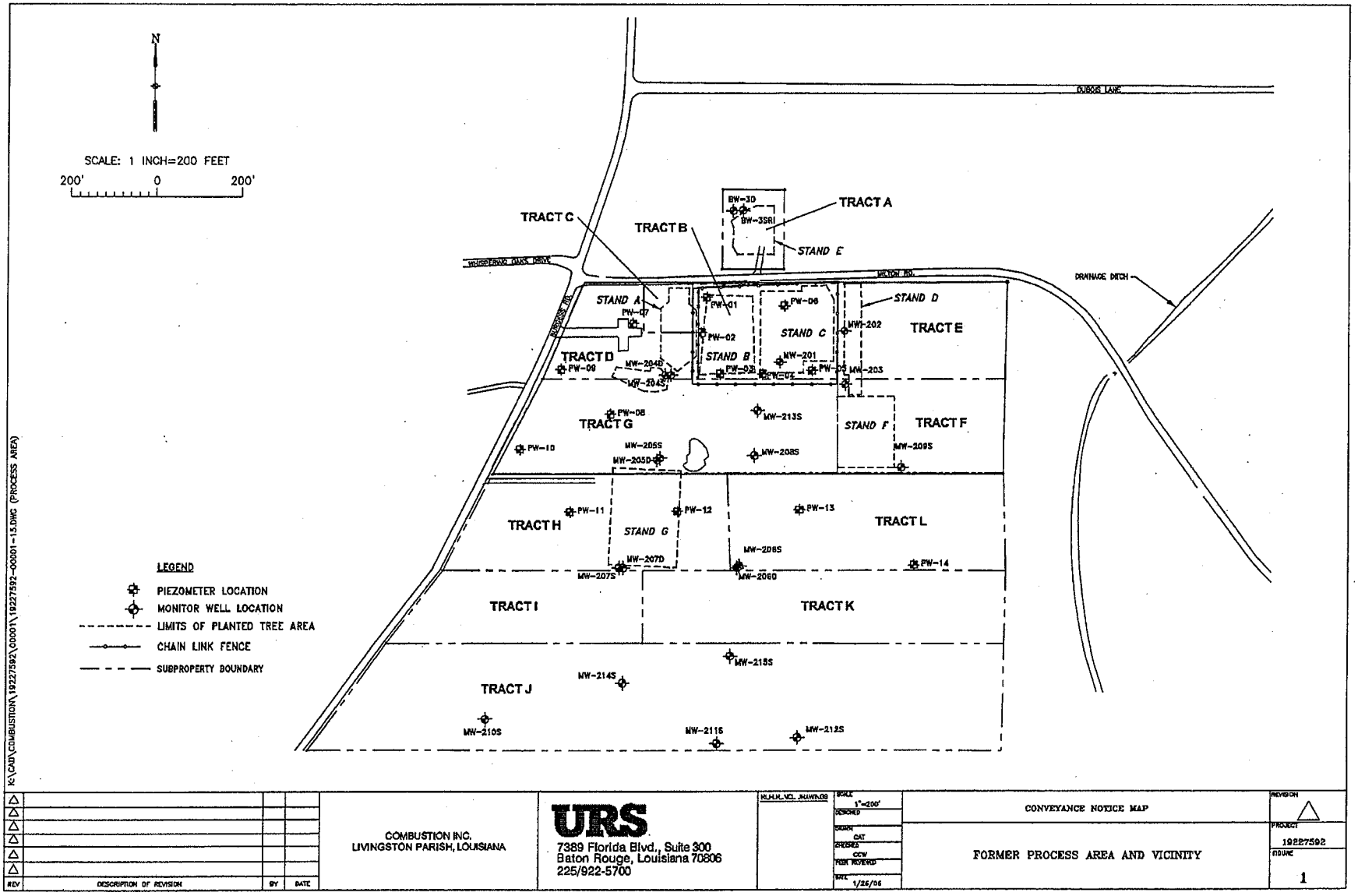
_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain tract or parcel of land, containing 8.82 acres, together with all the buildings and improvements thereon, situated in Section 22, Township 6 South, Range 3 East, in the Parish of Livingston, State of Louisiana, and being more specifically described according to a map entitled "A Survey Map Showing A 8.82 Acre Tract of Land Located in Section 22, T6S, R3E, Greensburg Land District, Livingston Parish, Louisiana for Clarence G. McCrory," dated August 16, 1983, and prepared by Louis L. Higginbotham, Registered Land Surveyor, a copy of which is on file and of record in the office of the Clerk and Recorder for said parish and state.

EXHIBIT 2


N
SCALE: 1 INCH=200 FEET
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DUBOIS LANE
WHISPERING OAKS DRIVE
HILTON RD.
DRAINAGE DITCH
TRACT A
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TRACT C
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TRACT G
TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
BW-3D
BW-3SRI
PW-01
PW-02
PW-03
PW-04
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PW-11
PW-12
PW-13
PW-14
MW-201
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MW-207D
MW-207S
MW-208S
MW-209S
MW-210S
MW-211S
MW-212S
MW-213S
MW-214S
MW-215S
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
REV
DESCRIPTION OF REVISION
BY
DATE
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
URS
7389 Florida Blvd., Suite 300
Baton Rouge, Louisiana 70806
225/922-5700
SCALE 1"=200'
DESIGNED
DRAWN CAT
CHECKED CCW
PEER REVIEWED
DATE 1/25/06
CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
REVISION
PROJECT 19227592
FIGURE 1

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

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Methylene Chloride	0.004
Tetrachloroethene	0.005
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Vinyl Chloride	0.002

610754_1

Livingston Parish Recording Page

Thomas L. Sullivan Jr.
Clerk of Court
PO Box 1150
Livingston, LA 70754-1150
(225) 686-2216

Received From :
LISKOW & LEWIS

First VENDOR
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

First VENDEE
COMBUSTION INC SITE REMEDIATION GROUP LLC

Index Type : Conveyances

File Number : 608520

Type of Document : Conveyances - General

Book : 934 **Page :** 968

Recording Pages : 6

Recorded Information

I hereby certify that the attached document was filed for registry and recorded in the Clerk of Court's office for Livingston Parish, Louisiana

On (Recorded Date) : 06/14/2006

At (Recorded Time) : 1:15:15PM

Doc ID - 005937900006

CLERK OF COURT
THOMAS L. SULLIVAN JR.
Parish of Livingston
I certify that this is a true copy of the attached document that was filed for registry and
Recorded 06/14/2006 at 1:15:15
Recorded in Book 934 Page 968
File Number 608520

Deputy Clerk

Return To :

Do not Detach this Recording Page from Original Document

CONVEYANCE NOTIFICATION

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COMBUSTION, INC. SITE
REMEDIATION GROUP, L.L.C.

By: _____
Lionel Bailey
Manager, Combustion, Inc. Site
Remediation Group, L.L.C.

Signed in my presence on the 21st day of June, 2006, in the presence of the undersigned competent witnesses and me, Notary, after reading of the whole.

WITNESSES:

_____
Print Name: Deborah Torcoll

_____
Print Name: Robert E. Holden

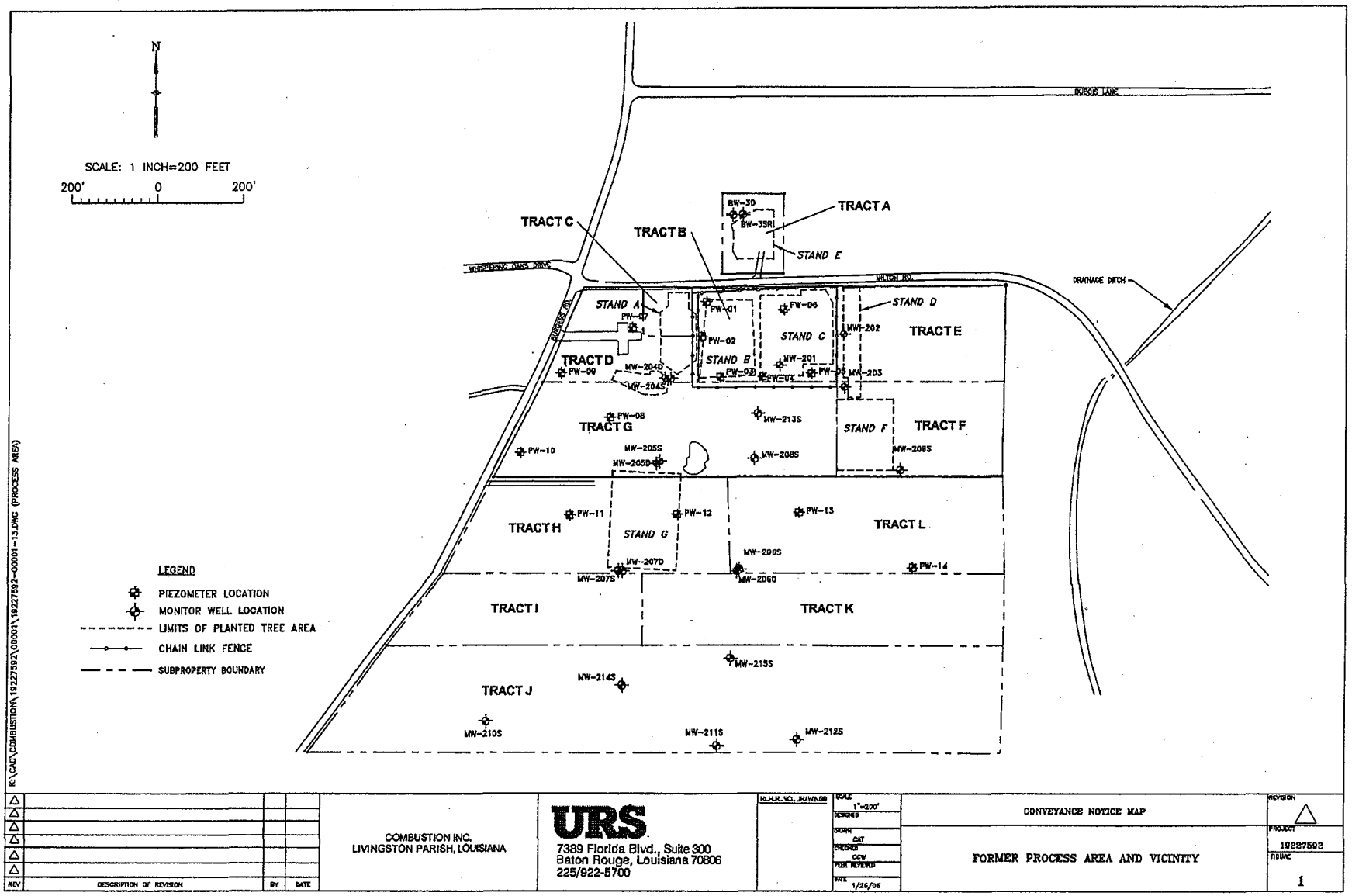
_____
NOTARY PUBLIC

LINDA LUSK
Notary Public
Parish of Orleans, State of Louisiana
Notary Identification #27671
My Commission is Issued for Life

EXHIBIT 1

A certain tract or parcel of land, containing 3.15 acres, together with all the buildings and improvements thereon, situated in Section 22, Township 6 South, Range 3 East, in the Parish of Livingston, State of Louisiana, and being described, according to a plat of survey by Alex Theriot, Jr. and Associates, Inc. dated January 21, 1982, said plat made a part hereof by reference, as TRACT "3-B," said tract being described, according to said survey as follows, to-wit: From the Southwest corner of Section 22, Township 6 South, Range 3 East, proceed North 00° 26' 00" East 2,209.9 feet to point and corner; thence South 89° 59' 25" East 2,042.71 feet to POINT OF BEGINNING: from said point of beginning, proceed South 89° 59' 25" East 632.29 feet and corner; thence South 00° 31' 14" East 217.26 feet and corner; thence North 89° 59' 25" West 632.29 feet to point on the Eastern margin of property owned by John Glynn McCrory and corner; thence North 00° 31' 14" West 217.26 feet back to point of beginning.

EXHIBIT 2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SCALE: 1 INCH=200 FEET
200' 0 200'
TRACT A
TRACT B
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TRACT H
TRACT I
TRACT J
TRACT K
TRACT L
STAND A
STAND B
STAND C
STAND D
STAND E
STAND F
STAND G
BW-3D
BW-3SR
PW-01
PW-02
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MW-215S
WHISPERING OAKS DRIVE
ACCESS RD.
WILTON RD.
DRAINAGE DITCH
LEGEND
PIEZOMETER LOCATION
MONITOR WELL LOCATION
LIMITS OF PLANTED TREE AREA
CHAIN LINK FENCE
SUBPROPERTY BOUNDARY
K:\CAD\COMBUSTION\19227592\00001\19227592-00001-15.DWG (PROCESS AREA)
COMBUSTION INC.
LIVINGSTON PARISH, LOUISIANA
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7389 Florida Blvd., Suite 300
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CONVEYANCE NOTICE MAP
FORMER PROCESS AREA AND VICINITY
1"=200'
CAT
CCV
1/25/06
19227592
1
REV
DESCRIPTION OF REVISION
BY
DATE

EXHIBIT 3

Cleanup Levels
Record of Decision
Table 11

Constituent	Remedial Standard (mg/L)
2,4/2,6 Toluenediamine	0.01
O and/or P Toluidine	0.01
1,1,2-Trichloroethane	0.005
1,1-Dichloroethane	0.749
1,1-Dichloroethene	0.006
1,2-Dichloroethane	0.005
Acetone	0.564
Benzene	0.005
Chloroethane	0.028
cis-1,2-Dichloroethene	0.518
Methylene Chloride	0.004
Tetrachloroethene	0.005
Toluene	1.00
Vinyl Chloride	0.002

610756_1

Attachment 7
Potentially Responsible Party Correspondence on Recommendations & Follow-up Actions Dated December 8, 2010

Combustion, Inc. PRP comments on draft FYR Report

Cheryl_Warren to: Katrina Coltrain, Todd.Thibodeaux 12/08/2010 11:02 AM

Cc: Brian.Kanzler, jctodd, "Bland, Carol", "Hudson, Caroline", "Cheng, Charlie", Cheryl_Warren, tsaodt, Dennis_Reece, "Howell, Desiree", "Reid-Green, Doug", "Johnson, Dwayne", EwilkersonBarron, Jerry_Aycock, "Carver, Jim", "Street, John", "Kirkeby, Kindra", "Trail, Kristi", "Tabary, Lloyd", "Allendorf, Mark", mark.s.nelson, "Raghuram, Mera", m.pisani, molly.m.shaffer, "Bernardo, Nan", nancy_vanburgel, "Taylor, Paul", rharris, "Brantley, Richard", reholden, "Courtright, Scott", "Livesay, Steve", "Gieck, Tom", Tom_Warren, William_Hurdle, "Schmidt, Steven", "Tonn, Keton"

History: This message has been replied to and forwarded.

Katrina/Todd -

The PRPs appreciate the opportunity to provide comments on the draft FYR report. Let us know if we can be of further assistance. Thanks.

Cheryl C. Warren, Ph.D., P.E.
Project Manager

URS Corporation
7389 Florida Blvd. Suite 300
Baton Rouge, LA 70806

Direct: 225/922-
Cell: 225/405-
Fax: 225/922-5

- _Recs & Followup Actions_120810.pdf

First Five-Year Review Report
Recommendations & Follow-up Actions
Combustion, Inc. Site
Livingston Parish, Louisiana

Introduction

The purpose of this document is to provide suggestions, comments and additional data to be considered by LDEQ, USEPA and its contractor in completion of the First Five-Year Review (FYR) Report. This document has been prepared by the Combustion, Inc. PRP Group which has been responsible for implementation, monitoring and reporting on the remedy for the site.

We appreciate USEPA and LDEQ providing the draft report to the Combustion, Inc. PRP group for review and comment. The PRPs are pleased to have successfully completed the first five year period and are looking forward to transitioning the remedy to maintenance and monitoring.

General Comments

Remedy Achieved Goals

Although the determination of the review states that the selected remedy is performing as intended, the summary of findings section should provide more comments to support this determination. We are concerned that the misalignment between the findings and the determination may lead to misunderstanding for the non-technical reader including the public. Examples of findings which could be included are as follows:

- Groundwater quality achieved the interim ROD goal of 10% reduction in mean concentration of tracking constituents ahead of the scheduled five year review.
- Significant shrinkage in plume mass and the absence of COC plume migration has been documented for the site.
- No vertical migration of COCs has been demonstrated for the site.
- Groundwater trends in selected individual monitor wells show dramatic reductions in tracking constituents including a 3 to 10 fold or greater decrease in TDA and EDC concentrations. This is significant as remediation completion will be determined using the primary line of evidence; groundwater concentration data.
- Establishment and maintenance of a robust stand of trees has been achieved, even through adverse weather conditions experienced at the site including major hurricanes.

- Uptake of constituents was positively demonstrated through tree core tissue sampling thus indicating through secondary line of evidence data that the trees are inhibiting movement of groundwater contamination and providing contaminant mass removal. Air samples collected at the same time as the cores did not shown any VOCs present (i.e., no volatilized COCs from the trees).
- Detection of degradation (or daughter) products provides a strong indication of the effectiveness of the natural attenuation and phytoremediation removal processes.
- Very strong public acceptance of the remedy from the local community based on interviews with community residents and public officials.
- Beautification of the community.
- Remedy has met all expectations despite an estimated two-year interruption/ setback in tree development as a results of Hurricanes Katrina, Rita, and Gustav.

The PRPs recommend insertion of an overview section before the background section of the First FYR report. This section would include a discussion of the positive achievements at the site under the Superfund program as noted above and conclude with the following statement:

"Based on the information available during the First FYR, the selected remedy for the Combustion, Inc. site has achieved the FYR goals and is performing as intended. This report has identified several issues for continued improvement which should be evaluated for implementation."

Special Testing to Demonstrate Technology

During the time period the remedy was proposed, selected and implemented, phytoremediation was considered an innovative remedy. When the monitoring program outlined in the ROD was agreed, it included additional secondary line of evidence testing and monitoring for the first five year period that EPA felt was needed to support reliance on groundwater quality as the primary line of evidence for remedy performance. Secondary line of evidence sampling (tree tissue, soils and transpiration gases) was added for years 4 and 5 at the request of the LDEQ and EPA to provide data to validate the remedy selection. Beyond this initial validating, the secondary line of evidence testing requirements have provided data of limited value, and they were not intended to be continued after completion of the first five years. The trees planted onsite are now well established and natural attenuation with phytoremediation is now demonstrated for the site.

In the final evaluation, improvement in groundwater quality to meet the clean-up goals for all constituents is the criterion that will determine the success of the remedy. Tracking of all site COCs is an important part of the PRPs' continued evaluation of the performance of the remedy. All COCs for the site are reported in the annual reports, and the PRPs are monitoring the progress towards the cleanup goals.

Specific Comments

The PRPs have accumulated a large amount of data over the first five years of remedy implementation and monitoring. These data were used to evaluate each finding and proposed action from the draft FYR report. These issues are discussed in a comment response format in detail in the remainder of this report.

Issue

1. The trends for the tracking constituents, toluenediamine (TDA) and 1,2-dichloroethane (EDC), are not similar for all Contaminants of Concern (COCs).

Recommendation & Follow-up Action

Evaluate the validity of the assumption that TDA and EDC are sufficient constituents to evaluate the performance of the remedy. Also, the addition of other COC to this analysis may be appropriate (e.g. benzene). Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

TDA and EDC are sufficient constituents to evaluate the performance of the remedy in reducing human health risks. When EDC and TDA were selected as tracking constituents for the site, these constituents were the human-health risk drivers from the VOA and SVOA analytical fractions, respectively. When the April 2010 data is compared to the ROD Cleanup Levels, these two COCs continue to have the highest risk ratios (comparison of COC concentration to COC Cleanup Level). Therefore, these constituents continue to be the human health risk drivers for the site.

Calculated Risk Ratios
Based On April 2010 Concentrations and ROD Cleanup Levels

Chemical	Units	ROD Cleanup Level	Maximum Detection	Risk Ratio
2,4/2,6-Toluenediamine	mg/L	0.01	24.8	***2480***
o and/or p-Toluidine	mg/L	0.01	0.531	53
1,1,2-Trichloroethane	mg/L	0.005	0.114	23
1,1-Dichloroethane	mg/L	0.749	9.29	12
1,1-Dichloroethene	mg/L	0.006	0.319	53
1,2-Dichloroethane	mg/L	0.005	3.53	***706***
Benzene	mg/L	0.005	0.0551	11
Chlorobenzene	mg/L	NL	0.00254	NA
Chloroethane	mg/L	0.028	0.0592	2
Chloroform	mg/L	NL	0.0295	NA

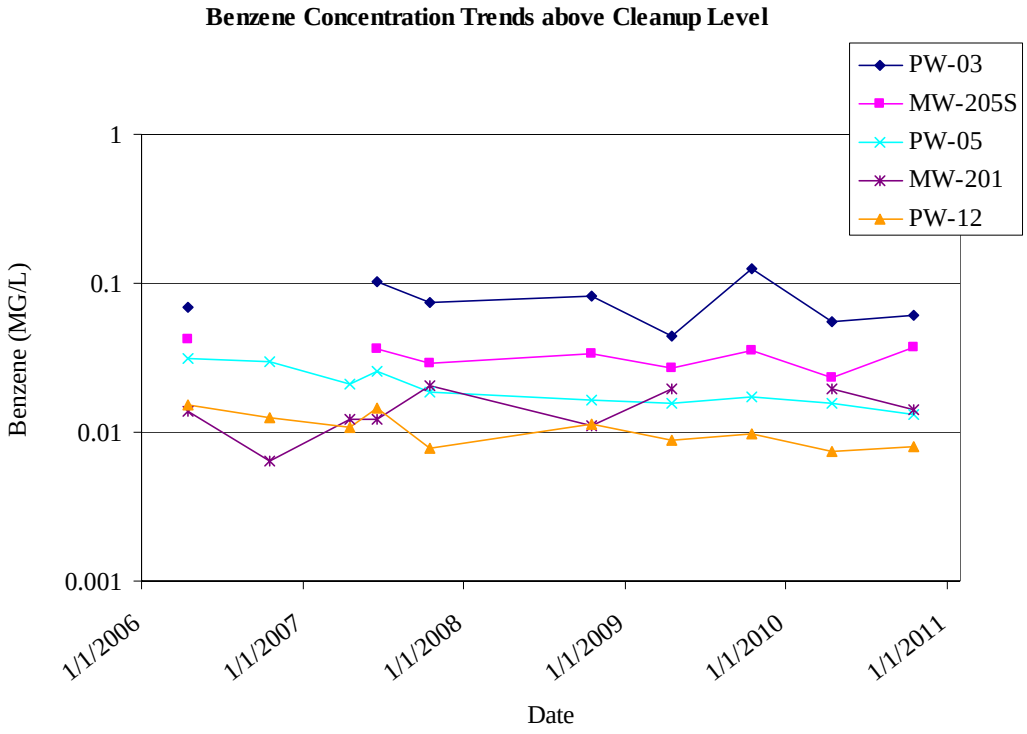
Chemical	Units	ROD Cleanup Level	Maximum Detection	Risk Ratio
cis-1,2-Dichloroethene	mg/L	0.518	0.0258	0
Ethylbenzene	mg/L	NL	0.0291	NA
Methyl ethyl ketone	mg/L	0.004	0.000486	0
Tetrachloroethene	mg/L	0.005	0.00135	0
Toluene	mg/L	1	8.82	9
Trans-1,2-dichloroethene	mg/L	NL	0.0822	NA
Trichloroethene	mg/L	NL	0.00835	NA
Vinyl chloride	mg/L	0.002	0.256	128
Xylenes (total)	mg/L	NL	0.0352	0

Table Note: NL = Not Listed, NA = Not Applicable

The PRPs are sampling and analyzing groundwater semiannually for the Louisiana RECAP VOA list (which covers parent and daughter VOAs) as well as TDA and o-toluidine from the aromatic amine (SVOA) fraction. In recent years, the PRPs have been tracking the concentration trends of each COC in every well where it is detected above the limiting MO-1 RECAP standard (see Attachment 1). This tracking has been performed by the PRPs because the Group wants to be better informed regarding the progress of the remedy in reaching the updated Cleanup Levels for all parent and daughter products.

Benzene is a likely TDA daughter product with toluidine (toluene monamine) and toluene as respective intermediate daughter products in the degradation process. Benzene was observed at the site during the first sample event in 1994. The footprint of the benzene plume, although smaller, closely resembles the footprint of the TDA plume. The benzene concentration trend line at MW-201 closely parallels the TDA daughter product toluene trend line.

Benzene is being carefully monitored by the PRPs. Benzene concentrations were above the ROD Cleanup Level of 0.005 mg/L (MCL) in six monitor wells based on the April 2010 data. In October 2010, the benzene concentration at MW-213S was reported as <0.005 mg/L. These same six monitor wells are within the interior of the TDA plume where the TDA groundwater concentrations are greatest. The concentration trend for benzene in these wells is decreasing or steady – no obvious increasing trends are observed (see inserted benzene concentration trend graph below).



PRP Recommendation & Follow-up Action

The PRPs will continue to include benzene concentration contour maps in the annual reports. As the TDA concentrations begin to decrease in the TDA plume interior wells, it is expected that the benzene concentrations within these wells will also decrease. As with other daughter products, the PRPs understand that the benzene concentrations must ultimately be degraded to below the ROD Cleanup Level for completion of the remedy. To track the daughter product concentration trends, all COCs above the updated Cleanup Levels (see Attachment 2 and Action Item 11 below) have been included in the concentration trend graphs (see Attachment 1). Likewise, COCs now below the revised Cleanup Levels have been removed from the trend graphs. Graphs for monitor wells now outside the plume have been removed from the set (MW-208S for example).

Issue

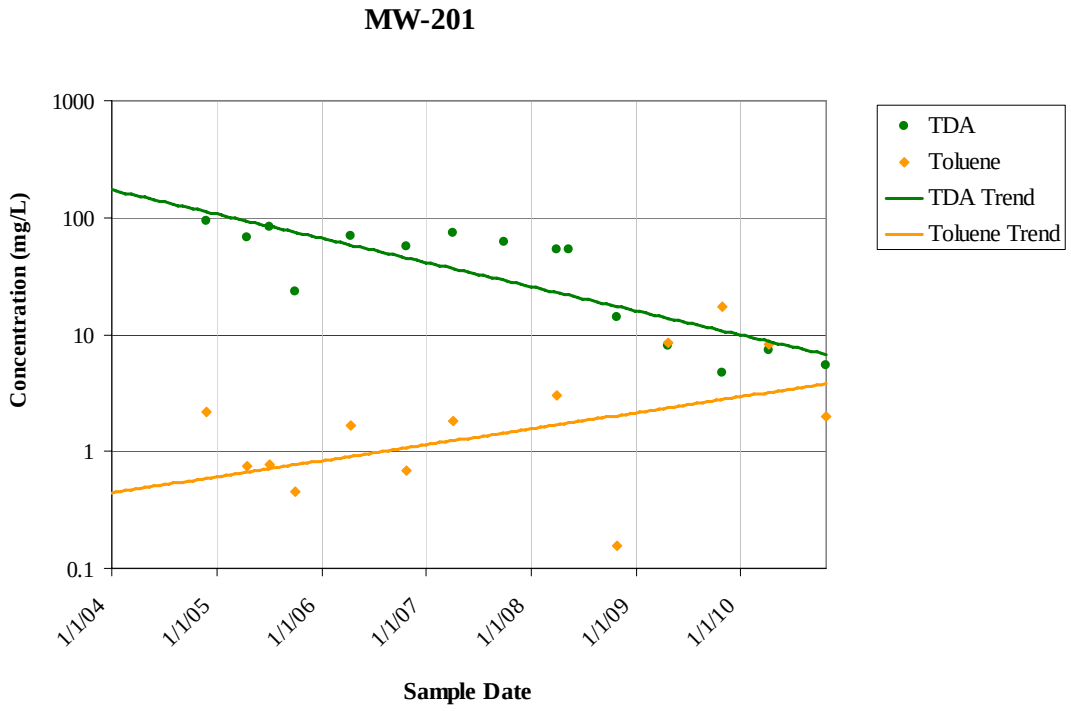
2. Daughter compounds such as toluene are increasing above the cleanup levels due to microbial degradation of TDA and other toluene based amines.

Recommendation & Follow-up Action

The accumulation of toluene above its cleanup goal requires evaluation. Although this trend is indicative that microbial degradation of TDA is occurring, ultimately toluene must be degraded to below standards. Follow-up action assigned to PRPs starting in 2011.

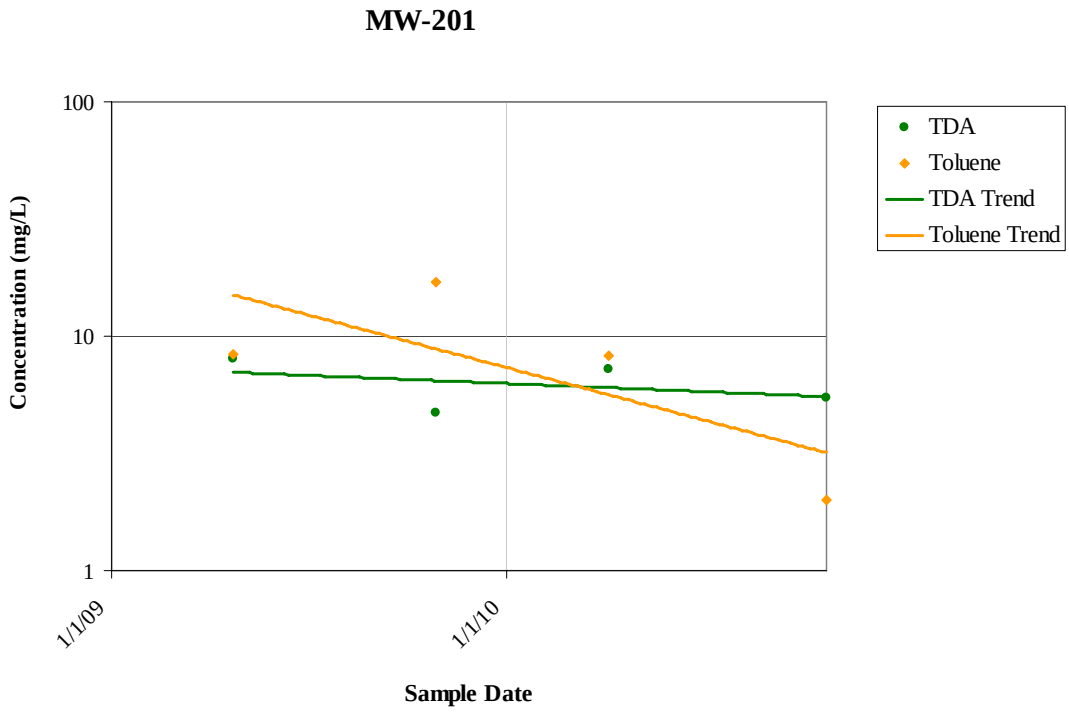
PRP Discussion

It was expected that as constituents were metabolized into daughter products, concentrations of daughter products would increase. In some cases, the daughter product concentration trends are upward while the parent products are trending downward (see concentration trend graph of TDA and daughter product toluene at MW-201 below). In other cases, the daughter products are breaking down as quickly as they are formed and the daughter product concentration trend is steady (see benzene concentration trend charts for Action Item 1).



PRP Recommendation & Follow-up Action

The PRPs have observed that the toluene concentration at MW-201 now appears to be decreasing (see graph below). The October 2010 sampling data report a decrease in both the concentrations for TDA (5.48 mg/L) and toluene (1.99 mg/L) at MW-201. The PRPs will continue to monitor the daughter product trends in all wells where they are detected. The PRPs concur that ultimately the toluene concentration must be degraded to below the ROD Cleanup Level.



Issue

3. Detection limits for some compounds are at or above the cleanup levels.

Recommendation & Follow-up Action

Select analytical methods and analytical laboratories that can achieve, ideally, sample quantitation limits an order of magnitude below the cleanup level so that performance of the remedy can be assessed and analytical error is not significant in analyte concentrations. If sample matrix interferes with the analysis, report both the pre- and post-dilution laboratory runs. Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

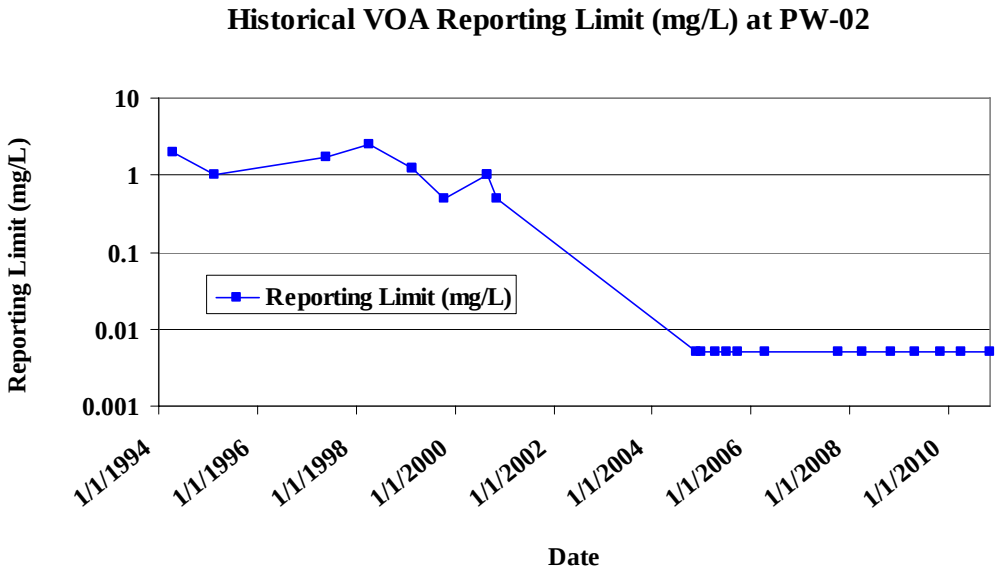
The issue of elevated detection limits applies only to a few COCs and wells (see October 2010 yellow shaded cells in Table 1). This issue does nothing to diminish the remedy or the monitoring of the remedial progress. The issue affects only those few wells with elevated COC concentrations that exceed analytical instrument limits (currently MW-201 [VOA fraction] and PW-04 [SVOA fraction]). As COC concentrations decline with remedy progress, this issue will be resolved (compare April 2006 to October 2010 yellow shaded cells in Table 1).

The PRPs are using Gulf Coast Analytical Laboratory (GCAL), a laboratory certified by the Louisiana Department of Environmental Quality to perform chemical analysis. GCAL has provided technical input in the response to this action item.

Historically, the matrix of a Combustion, Inc. site groundwater sample does not interfere with the chemical analysis. However COC concentrations in site groundwater at select monitor wells exceed the calibrated concentration range of the laboratory analytical instrument. When any COC within a sample is present at a concentration that exceeds the limit of the calibration range, the sample is diluted and the diluted sample analyzed such that the analytical instrument result falls within the calibration range of the instrument. The lowest possible dilution is applied to a sample to minimize the impact of dilution on the sample reporting limit. The dilution of the sample causes the reporting limit to be elevated by the dilution factor for all COCs within that particular sample, even if the other COCs are not present in the sample. GCAL SOPs for VOA and SVOA analytical methods include details for diluting samples when concentrations fall outside the instrument's calibration range.

Routinely there are samples where one or more COCs are detected at relatively high concentrations, while other COCs are present at much lower concentrations or are not present within the sample. For samples requiring dilution, GCAL attempts to run multiple dilutions of the sample on the instrument to minimize the reporting limit for each individual COC. The results of the multiple sample runs are combined to provide the best technical data set possible. However, there is a limit to the maximum concentration of any COC that can be introduced into the analytical instrument without exceeding the carry-over concentration of the instrument. Exceedance of the carry-over concentration will cause a COC to be retained in the instrument and be reported as belonging to a subsequent sample. Therefore, there is an upper limit on how concentrated a COC can be within any analyzed sample to prevent analytical instrument damage thus forcing the chemist to dilute samples with COCs at high concentrations prior to any analyses.

As the concentrations of the VOA COCs decrease within each monitor well, the dilutions required to analyze the analytical sample are decreased until, at some time in the future, an undiluted groundwater sample can be analyzed. Currently undiluted VOA samples are analyzed for all monitor wells except MW-201 (high toluene concentrations) and PW-01 and PW-01S (high EDC concentrations). Detection limits for the sentinel wells and plume perimeter wells are at or below the ROD Cleanup Levels. An example of the improvement in reporting limit for parent VOA COCs is shown in the graph below for PW-02. Initially PW-02 samples were diluted prior to analysis to prevent analytical instrument damage; however, no dilution has been required for the past several sampling events. Parent COC-dominated monitor wells at the site exhibit similar trends. Therefore as the remedy reaches completion, the reporting limits for every monitor well will be at or below the ROD Cleanup Levels.



PRP Recommendation & Follow-up Action

The PRPs have selected analytical methods and an analytical laboratory that can achieve method detection limits an order of magnitude below the Cleanup Levels for the site COCs. GCAL reports all concentrations measured above the method detection limit. Concentrations reported between the method detection limit and the reporting limit are flagged as estimated values ("J" qualified). All reported concentrations, including estimated values, are used in data presentation, visualization, and characterization (graphing, tabulating, statistical analysis, etc.). The current and future detection limits will not impair the PRPs' ability to monitor the progress of the remedy.

Issue

4. There is insufficient information to calculate hydraulic capture by the plant uptake. Hydraulic control is inconclusive during periods of drought due to dry wells and during high precipitation due to recharge.

Recommendation & Follow-up Action

Collect all information necessary to calculate the water balance by including soil storage component in addition to transpiration, precipitation and irrigation. The deflections in the potentiometric surface are subtle for the plant uptake, so a more accurate water balance may be required to implicitly demonstrate capture. Water balance, in concert with continued protective concentration trends in the sentinel wells, should be sufficient to demonstrate that the remedy remains protective. Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

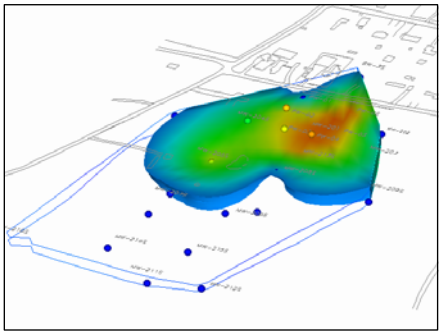
The purpose of the remedy is to "inhibit movement of groundwater contamination" (ROD page 33), not capture groundwater. Remedy success is to be judged on contaminant concentration reduction. The installed remedy has been very effective at contaminant concentration reduction through declining contaminant concentrations. The PRPs are evaluating the following primary lines of evidence derived from the groundwater concentration data to confirm that the remedy is achieving Remedial Action Objectives (RAOs). These primary lines of evidence include:

- Decrease in the mass of COCs within the groundwater plumes
- Reduction in the plume footprint
- Declining COC concentrations

A 78% reduction in the mass of TDA and a 55% reduction in the mass of EDC was observed during remedy years 1 – 5. Mass reduction ranges from 19% to 78% for the remaining COCs. The plume footprints have decreased for both the tracking constituents EDC and TDA. The COC concentrations are declining in all locations as shown in the trend charts (Attachment 1). Further details on the primary line of evidence evaluations are discussed below:

<u>Decrease in the Mass of COCs within the Groundwater Plumes</u>

The PRPs used the 3D Environmental Visualization System (EVS) software package from CTech to visualize and calculate the mass of the groundwater plumes in 3D. Calculations were performed using the 2006 Q2 and 2010 Q4 groundwater data sets. EVS calculated the mass of each COC within their respective plumes using interpolated data from the monitor well sampling events. EVS has been utilized for site-related calculations in the past. The same geology file used in previous studies was used to evaluate the success of remedy years 1 – 5 in decreasing COC mass.

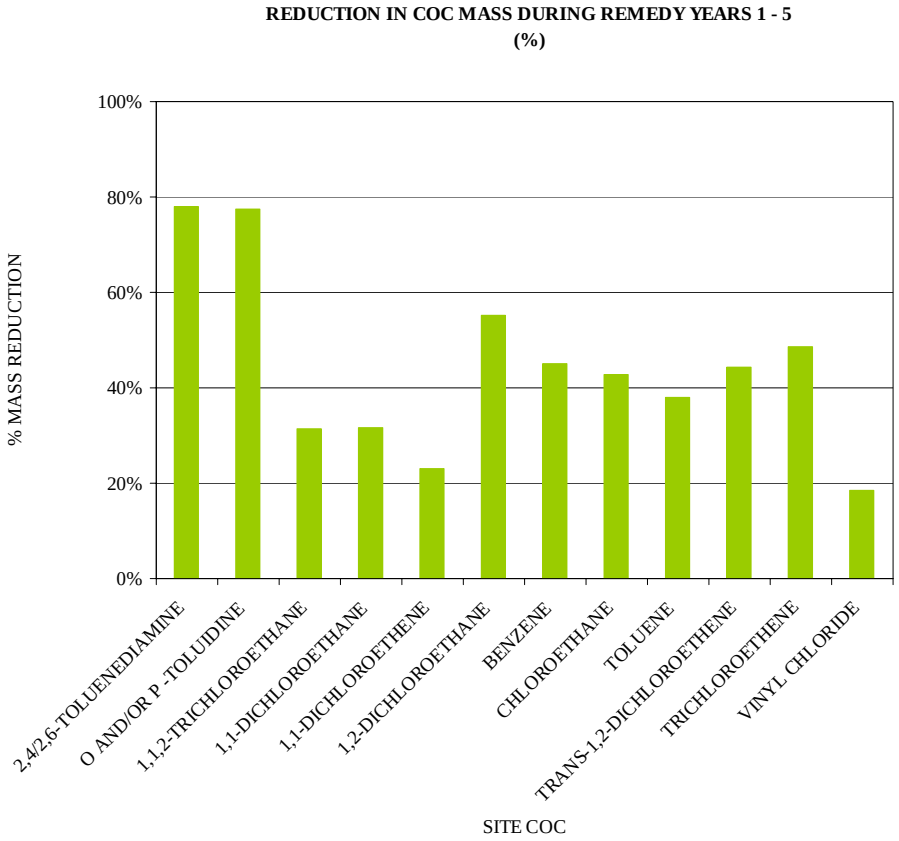


Calculated masses for remedy years 1 and 5 were compared to evaluate the percent reduction in the mass of each COC. Tabulated data from the EVS model is presented below:

3D Model-Calculated Reduction in COC Mass
For Remedy Years 1 - 5

Chemical (Concentrations in mg/L)	Remedy Year 1 Chemical Mass (Pounds at 1 gm/cc)	Remedy Year 5 Chemical Mass (Pounds at 1 gm/cc)	Reduction in Mass During Remedy Years 1 - 5 (%)
2,4/2,6-TOLUENEDIAMINE	4.3E+02	9.5E+01	78%
O AND/OR P -TOLUIDINE	1.1E+01	2.5E+00	78%
1,1,2-TRICHLOROETHANE	9.9E-01	6.8E-01	31%
1,1-DICHLOROETHANE	1.2E+01	8.1E+00	32%
1,1-DICHLOROETHENE	1.0E+00	8.0E-01	23%
1,2-DICHLOROETHANE	5.9E+00	2.6E+00	55%
BENZENE	1.2E+00	6.5E-01	45%
CHLOROETHANE	1.0E+00	6.0E-01	43%
TOLUENE	1.3E+00	8.2E-01	38%
TRANS-1,2-DICHLOROETHENE	1.1E+00	6.0E-01	44%
TRICHLOROETHENE	9.3E-01	4.8E-01	48%
VINYL CHLORIDE	5.9E-01	4.8E-01	19%

The tabulated data above is presented graphically below. The percent in mass reduction calculated ranges from 19% for vinyl chloride to 78% for TDA.



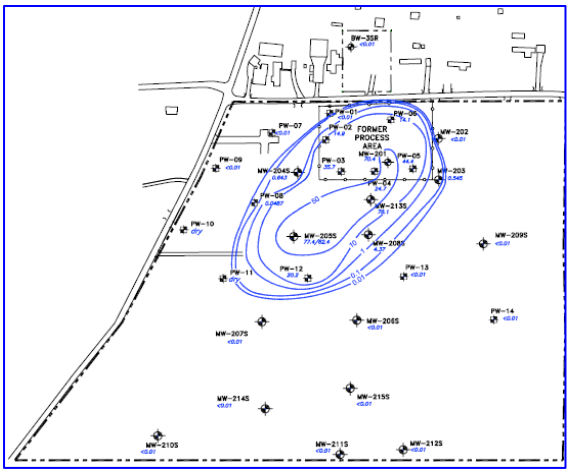
In addition to evaluating the mass reduction, the PRPs have been calculating the geometric mean concentration of the EDC and TDA plumes as defined in the Field Sampling Plan. The geometric mean concentrations of EDC and TDA within their respective plumes were to be used as the primary metric for remedy performance evaluation during the first five year period of the remedy. By comparing the geometric means from 2006 Q2 and 2010 Q4, the percent average concentration reduction can be calculated. The calculated mean concentration reductions are consistent with the mass reduction calculations determined from the 3D EVS software:

Parameter	Geometric Mean Concentrations		% Avg Concentration Reduction	% Constituent Mass Reduction
	2006 Q2	2010 Q4	Remedy Years 1 - 5	Remedy Years 1 - 5
EDC	0.08	0.03	67%	55%
TDA	5.74	1.28	78%	78%

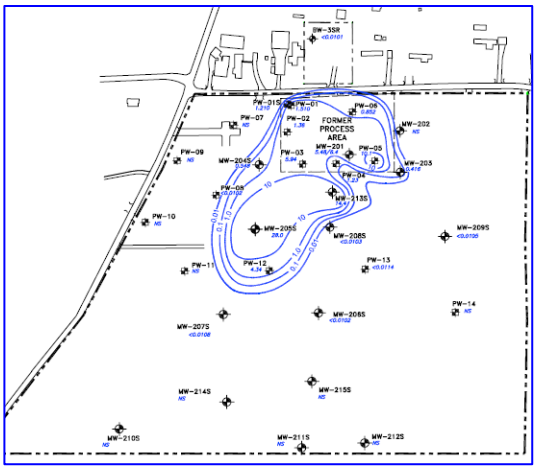
Reduction in the Plume Footprints

As the second primary line of evidence that the remedy is achieving RAOs, the PRPs have evaluated the reduction in the footprints of the TDA and EDC plumes. No vertical migration of COCs has been observed in the deep wells, and no downgradient migration has been observed in the sentinel wells. Therefore, a reduction in the areal footprint of the plume further indicates a reduction in plume volume and contaminant mass.

The footprint of the TDA plume has significantly decreased during remedy years 1 – 5 indicating significant shrinkage of the volume of the TDA plume. Wells MW-208S and PW-08 are no longer within the footprint of the TDA plume. Additionally the innermost contour of the plume is no longer present indicating that the concentrations within the TDA plume have also decreased during remedy years 1 – 5.

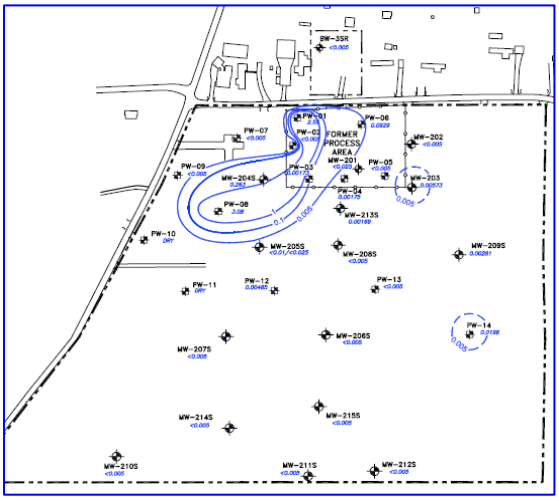


APRIL 2006 TDA PLUME

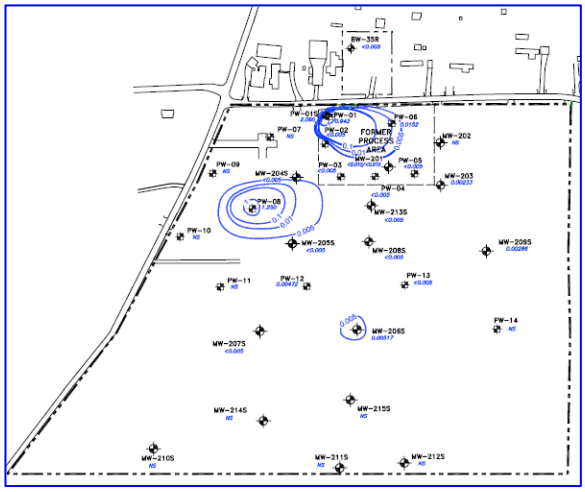


OCTOBER 2010 TDA PLUME

Likewise, the footprint of the EDC plume has also decreased. There are now two isolated locations where the EDC primarily exists (PW-01/PW-01S and PW-08). Wells MW-204S and PW-03 are no longer within the footprint of the EDC plume.



APRIL 2006 EDC PLUME



OCTOBER 2010 EDC PLUME

Declining COC Concentrations

The third primary line of evidence that the remedy is achieving RAOs is declining COC concentrations. Table 1 compares the COC concentrations from 2006 Q2 and 2010 Q4 for each monitor well. The concentrations have been shaded to indicate if the reported concentration is above or below the ROD Cleanup Level. A visual comparison indicates more green shaded cells in year 5 than year 1 indicating the remedy is achieving RAOs as the groundwater concentrations achieve Cleanup Levels. Furthermore, concentration trend versus time graphs for COCs present in each well are presented in Attachment 1. These trend graphs illustrate declining trends for parent COCs and declining or steady concentration trends for daughter product COCs.

PRP Recommendation & Follow-up Action

The stated purpose of the phytoremediation portion of the remedy is to "inhibit the movement of groundwater contaminants…" (ROD page 33) not to implicitly demonstrate capture of groundwater as stated in the report. As described above, there is an abundance of evidence based on the primary line of evidence groundwater concentrations that the remedy remains protective.

The PRPs have numerous sentinel monitor wells ringing the downgradient edge of the impacted groundwater. There are also additional lines of monitor wells located downgradient of the site. After groundwater sampling events established the location and perimeter of the impacted groundwater, sampling of the farthest downgradient wells was discontinued. The near monitor wells ringing the downgradient edge of the plumes, now

designated sentinel wells, continue to be sampled semiannually. Water balance calculations are not needed to demonstrate that the remedy remains protective and is achieving RAOs.

The PRPs will continue to sample the approved groundwater monitoring system, including the sentinel wells, semiannually to demonstrate that the remedy remains protective.

The PRPs recommend this finding and action be removed from the First FYR Report.

Issue

5. The shift of the soil and ground water from anaerobic to microaerobic conditions (e.g. dissolved oxygen (DO) >1 mg/L) is problematic for continued reductive dechlorination of EDC and other chlorinated aliphatic hydrocarbons. Data indicate that EDC/chlorinated aliphatic hydrocarbon biodegradation is slowing down and may not be viable under current conditions (increasing in DO and oxidation-reduction potential ([ORP]).

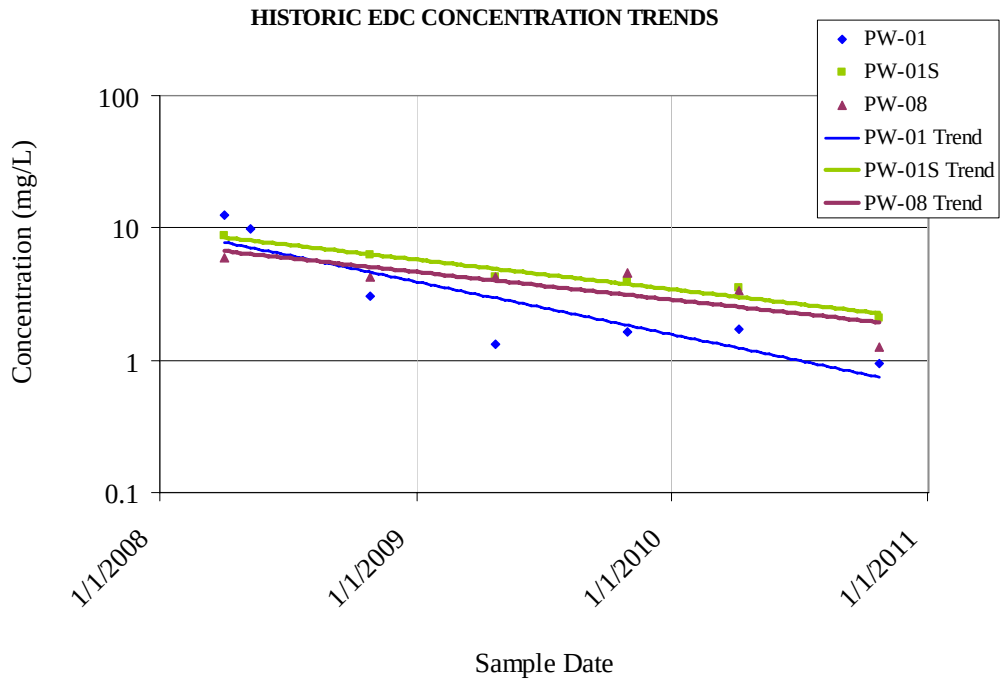
Recommendation & Follow-up Action

Evaluate if the microbial degradation of EDC and other chlorinated aliphatic hydrocarbons stalls. Evaluate if a staged approach in contamination reduction can be implemented (e.g. remediate phenolic compounds and then induce reversal of the subsurface environment back to an anaerobic environment capable of reductive dechlorination of chlorinated aliphatic hydrocarbons). Confirm that due to reducing conditions, vinyl chloride does not begin to accumulate to concentrations above the action level. Follow-up action assigned to PRPs starting in 2011.

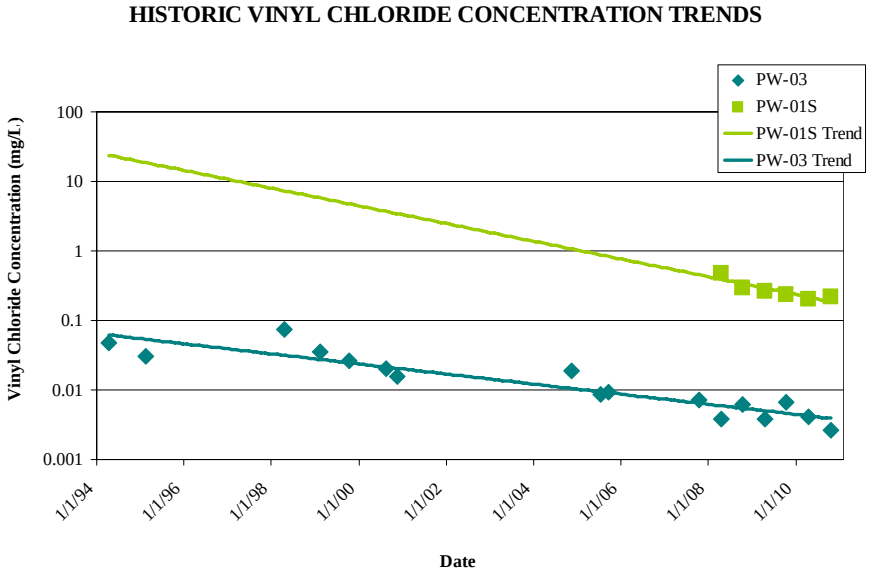
PRP Discussion

While the microbial degradation is one aspect of the ROD selected remedy, the other aspect of the ROD remedy is phytoremediation. The Action Item presented herein is focused solely on the MNA portion of the remedy and not the remedy as a whole. The EDC concentration trend charts developed for each monitor well are a tool for evaluating if the EDC concentration reduction trend stalls.

Within the EDC groundwater plume interior the concentration trends are continuing to decline for monitor wells PW-01 and PW-01S. The longer-term EDC concentration trend for monitor well PW-08 is steady. However, during the 2010 Q4 sampling event the EDC concentration in PW-08 had decreased to one-half of its 2010 Q2 concentration so the short-term EDC trend for PW-08 is decreasing. Near-term concentration versus time trends for the interior wells of the EDC plume(s) are shown below:



The PRPs have been monitoring concentration trends of all COCs such as vinyl chloride in the groundwater plume. Initially vinyl chloride was detected in PW-03 as early as 1994 at concentrations above the ROD Cleanup Level. As the remediation has progressed, vinyl chloride concentrations have decreased in several monitor wells. Currently the highest concentration of vinyl chloride is observed at PW-01S. Historic vinyl chloride trends for PW-03 and PW-01S are shown below. Other monitor wells at the site are exhibiting similar behavior for vinyl chloride.



PRP Recommendation & Follow-up Action

The PRPs are aware of this as a potential issue and will continue to monitor the concentration reduction trends for COCs and daughter products at the site. If concentration trends indicate a lack of progress over a 2 to 3 year period, alternative approaches or enhancements will be evaluated.

Issue

6. Soil gas sample results were inconclusive in demonstrating contaminant biodegradation.

Recommendation & Follow-up Action

Soil sampling, if continued, should be aimed at enumerating microbial populations that specifically degrade the COCs or daughter products. If these microbial populations are robust and subsurface biogeochemical conditions favorable, contaminant degradation in the rhizosphere should follow. Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

Contamination degradation in the rhizosphere implies that the remedy was selected to address impacted soils, not impacted groundwater. The ROD remedy was selected to address impacted groundwater.

PRP Recommendation & Follow-up Action

If continued, soil sampling will be aimed at enumerating microbial populations that specifically degrade the COCs or daughter products (i.e. *Dehalococcoides* organisms*)*.

During the time period the remedy was proposed, selected and implemented, phytoremediation was considered an innovative remedy. When the monitoring program outlined in the ROD was agreed, it included additional secondary line of evidence testing and monitoring for the first five year period that EPA felt was needed to support reliance on groundwater quality as the primary line of evidence for remedy performance. Secondary line of evidence sampling (tree tissue, soils and transpiration gases) was added for years 4 and 5 at the request of the LDEQ and EPA to provide data to validate the remedy selection. Beyond this initial validating, the secondary line of evidence testing requirements have provided data of limited value, and they were not intended to be continued after completion of the first five years. The trees planted onsite are now well established and natural attenuation with phytoremediation is now demonstrated for the site.

The PRPs recommend this finding and action be removed from the First FYR Report.

Issue

7. The number of data used to verify BIOCHLOR and BIOSCREEN modeling is limited. The model outputs appear to be underestimating the transport and fate of TDA and EDC. It is suggested that more data be used to validate the models.

Recommendation & Follow-up Action

It is suggested that (1) either more monitoring well points be used to validate the models, or (2) if the plume remains stable to declining, and if concentrations continue to trend downward indicating biodegradation and attenuation, then use of these screening models may not be necessary to demonstrate achieving RAO. Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

The PRPs' concept was to use the screening models as predictive tools to evaluate the potential effectiveness of remediation prior to implementation of the remedy. Now that primary line of evidence groundwater concentration data are available and this evidence demonstrates that the remedy is providing positive results, the PRPs agree that use of screening models is not necessary to demonstrate achieving RAOs.

PRP Recommendation & Follow-up Action

The PRPs will continue to evaluate the primary line of evidence groundwater concentration data as the principal means to demonstrate that the remedy is achieving RAOs.

Issue

8. To date, both the EDC and TDA plumes have shrunk and the decay rate constants are decreasing rather than staying constant or increasing, suggesting that the ROD-required Buscheck and Alcantar method may no longer be applicable.

Recommendation & Follow-up Action

BIOSCREEN and BIOCHLOR couple steady-state, one dimensional advection-dispersion equations with first order chain decay rates for each chemical in the biodegradation pathway of the COC. Both assume a continuous source, are conservative and with increasing plume dimension scenarios (e. g. both width and length), and may provide reasonable estimates of the rate constants that are applicable under current field conditions. Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

The PRPs agree that the statements made in the recommendations sections might be true for certain field conditions. Due to the success of the remedy, the number of data points available in either the TDA or EDC plumes is very limited for a comparison of source area to downgradient concentrations.

PRP Recommendation & Follow-up Action

To maintain consistency with the ROD, the PRPs will continue to utilize the methods of Buscheck and Alcantar. In their 1995 paper, Buscheck and Alcantar state that when declining contaminant concentrations are observed in monitor wells, the first-order decay equation may be used to evaluate contaminant concentration versus time for individual monitor wells. First-order decay trend graphs are presented in Attachment 1. Declining contaminant concentrations are observed in monitor wells at the Combustion, Inc. site except at MW-201 where increasing concentrations of daughter products toluene and benzene are observed; however, the daughter product concentrations appear to be decreasing now as well (details provided previously in Issue 2 discussion). Further details were provided in the 2010 Annual Report, Year 5 Remedy Implementation, Combustion, Inc. site, Livingston Parish, Louisiana.

Issue

9. The cleanup level for *cis*-1,2-dichloroethene is set at 0.518 mg/L, which is significantly higher than the Maximum Contaminant Level (MCL) of 0.07 mg/L.

Recommendation & Follow-up Action

Reevaluate the plume delineation and extent of the remedy influence to ascertain that the extent of the impact is addressed by the remedy. Revise the cleanup level to the MCL. Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

The groundwater at the site is classified as a GW2 groundwater. GW2 groundwater is not considered to be a public groundwater supply because it produces an insufficient yield (RECAP). As part of the Feasibility Study, Management Option-1 (MO-1) GW2 RECAP standards were calculated for the site groundwater. EPA decided that for certain COCs the MCL would be applied and for other COCs the RECAP standard would be utilized. The regulatory program source for the ROD groundwater Cleanup Levels is tabulated below.

Regulatory Program Source for ROD Cleanup Levels

Parameter	ROD Cleanup Level (mg/L)	Source of Standard
2,4/2,6-Toluenediamine	0.01	RECAP
o and/or p-Toluidine	0.01	RECAP
1,1,2-Trichloroethane	0.005	RECAP
1,1-Dichloroethane	0.749	RECAP
1,1-Dichloroethene	0.006	RECAP
1,2-Dichloroethane	0.005	MCL
Acetone	0.564	RECAP
Benzene	0.005	RECAP
Chloroethane	0.028	RECAP
cis-1,2-Dichloroethene	0.518	RECAP
Methylene chloride	0.004	RECAP
Tetrachloroethene	0.005	RECAP
Toluene	1	MCL
Vinyl chloride	0.002	RECAP

Currently (sampling events 2010 Q2 and 2010 Q4), the reported concentrations of *cis*-1,2-dichlorethene are below the MCL of 0.07 mg/L. The maximum reported concentrations of *cis*-1,2-dichlorethene from April 2010 and October 2010 sampling events are 0.0258 mg/L (PW-03) and 0.0105 mg/L (PW-01S), respectively.

PRP Recommendation & Follow-up Action

The methods used to calculate the MO-1 GW2 RECAP standards are still valid. No action is required by the PRP Group for Action Item 9. The ROD Cleanup Level for *cis*-1,2-dichlorethene is compliant with current regulations. Note also that current concentrations of *cis*-1,2-dichlorethene are below the MCL of 0.07 mg/L.

Issue

10. The human health risk assessment did not evaluate volatilization from groundwater to indoor air for the Process Area which is not restricted for future use.

Recommendation & Follow-up Action

Evaluate the potential for human health risk under the indoor exposure pathway at the Process Area. Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

The PRPs have evaluated the indoor air exposure pathway for the Process Area. Based on current methodology (RECAP, 2003), the non-industrial (residential) indoor air pathway is not the risk driver for any COC. Additionally, the PRPs, through the

Combustion, Inc. Site Remediation Group, LLC, own the former Process Area and an additional 30 acres downgradient. The site employs no full-time labor force so there are no occupied buildings on site. The Process Area is locked and gated and is therefore not accessible to the surrounding community. Conveyance notices restrict future site development, if any, to commercial or industrial development.

The PRPs have updated the calculation of Cleanup Levels consistent with GW2 RECAP 2003 methods based on the 2010 Q2 and 2010 Q4 groundwater data sets. Form 15 Screening Option Submittal for Groundwater and Form 16 Management Option 1 (MO-1) Submittal for Groundwater are provided in Attachment 2. RECAP MO-1 calculations include the option to evaluate RECAP standards GWesni (standard for groundwater beneath an enclosed structure in a non-industrial setting) and GWairni (standard for volatile emissions from groundwater to the ambient air in a non-industrial setting). The limiting MO-1 RECAP standard for a COC is the minimum of the following calculated MO-1 standards for that COC: final GW2, GWesni, GWairni, and COC solubility. The ROD Cleanup Level for each COC was then assigned as the limiting MO-1 RECAP standard for the COC[1].

Comparison of 2010 Q4 Concentrations to
Residential (Non-Industrial) Indoor Air Quality Standards (GWesni)

2010 Q4 MO-1 RECAP Parameter List	GWesni (mg/L)	2010 Q4 Concentration (mg/L)	CC Exceeds GWesni?
2,4/2,6-Toluenediamine	NA	2.8E+01	No
o and/or p-Toluidine	NA	4.1E-01	No
Trichloroethane,1,1,2-	8.4E+00	3.6E-02	No
Dichloroethane,1,1-	1.4E+02	5.7E+00	No
Dichloroethene,1,1-	1.8E+01	1.8E-01	No
Dichloroethane,1,2-	3.6E+00	2.1E+00	No
Benzene	2.9E+00	6.2E-02	No
Chloroethane (ethylchloride)	5.1E+03	1.2E-02	No
Toluene	8.9E+01	2.0E+00	No
Vinyl chloride	2.0E-01	2.2E-01	Yes

With the exception of vinyl chloride at PW-01S, current site groundwater concentrations meet RECAP non-industrial indoor air standards, GWesni. Vinyl chloride concentrations at PW-01 meet the GWesni standard. PW-01S is a sister well to PW-01. The concentration trend of vinyl chloride in PW-01S is declining (details provided previously in Issue 5 discussion).

[1] EPA assigned the MCL as the ROD Cleanup Level for EDC and toluene.

PRP Recommendation & Follow-up Action

The PRPs have provided an updated human health risk evaluation using RECAP evaluation including the RECAP indoor exposure pathway GWesni. RECAP Form 16 of Attachment 2 demonstrates that the volatilization pathway from groundwater to indoor air is not the risk driver pathway for any COC. Under current methodologies, the GW2 groundwater pathway as defined by RECAP continues to be the risk driver for each COC.

Issue

11. Human health risk assessment methodologies have changed since the assessment was performed at the site.

Recommendation & Follow-up Action

Evaluate if under the current methodologies the cleanup levels are still adequate. Follow-up action assigned to PRPs starting in 2011.

PRP Discussion

As discussed above, the Cleanup Levels for the upper water-bearing zone groundwater were calculated using RECAP (LDEQ 2000). RECAP was updated in 2003; however, the calculation methods remain essentially the same. As discussed in the Action Item 10, the PRPs have utilized current RECAP methodologies (2003) to update the Cleanup Levels using RECAP Forms 15 and 16 (see Attachment 2).

PRP Recommendation & Follow-up Action

As the COCs continue to breakdown at the site causing a continual shift in the COC profile, the additivity factors applied to the non-carcinogenic COCs require re-evaluation. The PRPs will recalculate and resubmit RECAP Forms 15 and 16 with each five-year review to evaluate COC groundwater concentrations against updated site-specific Cleanup Levels calculated using current RECAP methodologies. These updated Cleanup Levels have been compared to the 2010 Q2 (April) and 2010 Q4 (October) groundwater concentration data sets as shown in Tables 2 and 3, respectively. A comparison of ROD Cleanup Levels to the 2010 Q4 updated Cleanup Levels is tabulated below:

Comparison of ROD Cleanup Levels to 2010 Q4 updated Cleanup Levels

2010 Q4 MO-1 RECAP Parameter List	ROD Cleanup Level (mg/L)	2010 Q4 MO-1 RECAP Standard (mg/L)
2,4/2,6-Toluenediamine	1.0E-02	1.0E-02
o and/or p-Toluidine	1.0E-02	1.0E-02
Trichloroethane,1,1,2-	5.0E-03	3.7E-02

2010 Q4 MO-1 RECAP Parameter List	ROD Cleanup Level (mg/L)	2010 Q4 MO-1 RECAP Standard (mg/L)
Dichloroethane,1,1-	7.5E-01	6.0E+00
Dichloroethene,1,1-	6.0E-03	5.2E-02
Dichloroethane,1,2-	5.0E-03	3.7E-02
Benzene	5.0E-03	3.7E-02
Chloroethane (ethylchloride)	2.8E-02	2.8E-02
Toluene	1.0E+00	7.4E+00
Vinyl chloride	2.0E-03	3.7E-02

TABLES

Table 1
COC Concentration Comparison at
Plume Defining Monitor Wells
Remedy Years 1 - 5

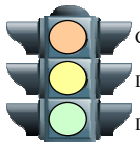
APRIL 2006 DATA

Chemical (Concentrations in mg/L)	ROD Cleanup Level[a]	MW-201	MW-203	MW-204S	MW-205S	MW-208S	MW-213S	PW-01	PW-02	PW-03	PW-04	PW-05	PW-06	PW-08	PW-12
2,4/2,6-TOLUENEDIAMINE	0.01	70.4	0.545	0.643	77.4	4.37	78.1	<0.01	14.9	35.7	24.7	44.4	14.1	0.0487	20.2
O AND/OR P -TOLUIDINE	0.01	<2	<0.02	0.0181	0.845	<0.2	<2	<0.002	0.382	0.941	<1	0.792	<0.5	0.0065	0.211
1,1,2-TRICHLOROETHANE	0.005	<0.025	<0.005	0.00228	<0.01	<0.005	<0.005	0.0779	<0.005	<0.005	<0.005	<0.005	<0.005	0.0438	<0.005
1,1-DICHLOROETHANE	0.749	<0.025	0.00139	0.365	0.864	0.00667	0.0302	3.41	0.0427	0.458	0.117	0.0114	0.108	2.5	0.0142
1,1-DICHLOROETHENE	0.006	<0.025	<0.005	0.008	<0.01	<0.005	<0.005	0.0693	<0.005	<0.005	<0.005	<0.005	0.00317	0.115	<0.005
1,2-DICHLOROETHANE	0.005	<0.025	0.00573	0.263	<0.01	<0.005	0.00169	2.55	<0.005	0.00173	0.00175	<0.005	0.0929	3.08	0.00465
BENZENE	0.005	0.0138	0.0011	0.00247	0.0416	0.00583	0.007	<0.05	0.00248	0.0694	0.00265	0.0313	<0.005	<0.05	0.0152
CHLOROETHANE	0.028	<0.025	<0.005	0.00412	0.0335	<0.005	<0.005	<0.05	0.00225	<0.005	<0.005	0.0256	<0.005	<0.05	<0.005
TOLUENE	1	1.65	<0.005	<0.005	<0.01	0.00228	0.00099	<0.05	<0.005	<0.005	0.00117	0.0196	<0.005	<0.05	0.00477
TRANS-1,2-DICHLOROETHENE	0.1	<0.025	<0.005	<0.005	<0.01	0.00705	<0.005	<0.05	<0.005	<0.005	<0.005	0.0435	<0.005	<0.05	0.0201
TRICHLOROETHENE	0.005	<0.025	<0.005	<0.005	<0.01	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005
VINYL CHLORIDE	0.002	<0.01	<0.002	0.00829	<0.004	<0.002	<0.002	0.109	<0.002	<0.002	<0.002	<0.002	0.00341	0.0262	<0.002

OCTOBER 2010 DATA

Chemical (Concentrations in mg/L)	ROD Cleanup Level[a]	MW-201	MW-203	MW-204S	MW-205S	MW-208S	MW-213S	PW-01	PW-02	PW-03	PW-04	PW-05	PW-06	PW-08	PW-12
2,4/2,6-TOLUENEDIAMINE	0.01	5.48	0.416	0.548	28	<0.0103	19.8	1.51	1.36	5.94	1.23	10.1	0.852	<0.0102	4.34
O AND/OR P -TOLUIDINE	0.01	0.0909	0.0316	0.0151	0.314	0.000531	0.306	0.0212	0.117	0.31	<0.211	0.413	0.00715	<0.00204	0.0552
1,1,2-TRICHLOROETHANE	0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	0.024	<0.005	<0.005	<0.005	<0.005	<0.005	0.0216	<0.005
1,1-DICHLOROETHANE	0.749	<0.01	0.00746	0.0938	0.529	0.00119	0.00913	2.78	0.0231	0.179	0.0188	0.00929	0.0655	1.16	0.0629
1,1-DICHLOROETHENE	0.006	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	0.0641	<0.005	<0.005	<0.005	<0.005	0.00174	0.0475	<0.005
1,2-DICHLOROETHANE	0.005	<0.01	0.00233	<0.005	<0.005	<0.005	<0.005	0.942	<0.005	<0.005	<0.005	<0.005	0.0152	1.25	0.00472
BENZENE	0.005	0.0143	0.00284	0.00407	0.0369	<0.005	<0.005	0.00267	0.00286	0.0615	0.00231	0.0131	<0.005	0.00474	0.00798
CHLOROETHANE	0.028	<0.01	<0.005	<0.005	0.00669	<0.005	<0.005	<0.01	<0.005	0.0119	<0.005	<0.005	<0.005	0.00808	<0.005
TOLUENE	1	1.99	0.186	<0.005	<0.005	<0.005	0.00172	0.00185	<0.005	<0.005	<0.005	0.00714	<0.005	<0.01	0.00133
TRANS-1,2-DICHLOROETHENE	0.1	<0.01	0.00888	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	0.0126	<0.005	<0.01	<0.005
TRICHLOROETHENE	0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	0.00217	<0.005	<0.005	<0.005	<0.005	<0.005	0.00233	<0.005
VINYL CHLORIDE	0.002	<0.004	0.00159	0.00175	0.00116	<0.002	<0.002	0.12	<0.002	0.00264	<0.002	<0.002	<0.002	0.00901	<0.002

ROD CLEANUP LEVELS STOPLIGHT LEGEND



Concentration exceeds ROD Cleanup Level

Detection limit doesn't meet ROD Cleanup Level

Detection limit and/or concentration meets ROD Cleanup Level

Notes:

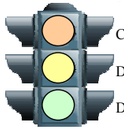
a For COC with no defined ROD Cleanup Level, comparison was made to RECAP GW_SS.

Table 2

Validated Groundwater Analytical Results, April 2010
Upper Water-Bearing Zone
Combustion, Inc. Site
Livingston Parish, Louisiana

Chemical Group	Method	Chemical	Units	RECAP GW_SS[1]	Limiting MO-1 RECAP Standard[2]	BW-3S	MW-201	MW-201 FD	MW-203	MW-204S	MW-205S	MW-206S	MW-207S	MW-208S	MW-209S	MW-209S FD	MW-213S	PW-01	PW-01S	PW-02	PW-03	PW-04	PW-05	PW-06	PW-08	PW-12	PW-13
TDA	8270	2,4/2,6-TOLUENEDIAMINE	mg/L	1.0E-02	1.0E-02	<0.0101	7.25	12.8	0.0162	2.82	24.8	<0.0104	<0.011	0.00456	<0.0102	<0.0101	20.2	<0.0101	0.0281	7.32	4.93	0.0637	7.88	1.67	0.00294	5.44	<0.0115
TDA	8270	O AND/OR P -TOLUIDINE	mg/L	1.0E-02	1.0E-02	<0.00202	0.144	0.253	0.0212	0.0305	0.366	<0.00208	<0.0022	0.0013	<0.00204	<0.00202	0.235	<0.00202	0.00205	0.435	0.255	0.00287	0.531	0.0341	0.00161	0.0758	<0.0023
VOA	8260B	1,1,2-TRICHLOROETHANE	mg/L	5.0E-03	3.7E-02	<0.005	<0.05	<0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.000418	0.000422	<0.005	0.114	0.084	<0.005	<0.005	<0.005	<0.005	<0.005	0.0522	<0.005	<0.005
VOA	8260B	1,1-DICHLOROETHANE	mg/L	8.1E-02	6.0E+00	<0.005	<0.05	<0.2	0.00678	0.139	0.374	<0.005	<0.005	0.00102	<0.005	<0.005	0.00518	4.03	9.29	0.0837	0.168	0.0182	0.0106	0.0459	2.75	0.0652	<0.005
VOA	8260B	1,1-DICHLOROETHENE	mg/L	7.0E-03	5.2E-02	<0.005	<0.05	<0.2	<0.005	0.000923	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.319	0.277	<0.005	<0.005	<0.005	<0.005	0.00161	0.112	<0.005	<0.005
VOA	8260B	1,2-DICHLOROETHANE	mg/L	5.0E-03	3.7E-02	<0.005	<0.05	<0.2	0.00262	0.0043	<0.005	0.00551	<0.005	<0.005	0.00338	0.00349	<0.005	1.7	3.53	<0.005	0.00192	<0.005	<0.005	0.0482	3.32	0.00417	<0.005
VOA	8260B	BENZENE	mg/L	5.0E-03	3.7E-02	<0.005	0.0185	0.0195	0.00217	0.0033	0.023	<0.005	<0.005	0.000342	<0.005	<0.005	0.00632	0.00191	<0.1	0.00305	0.0551	0.00244	0.0156	0.000303	0.00421	0.00741	<0.005
VOA	8260B	CHLOROBENZENE	mg/L	1.0E-01	NA	<0.005	<0.05	<0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00254	<0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005
VOA	8260B	CHLOROETHANE	mg/L	1.0E-02	2.8E-02	<0.005	<0.05	<0.2	<0.005	<0.005	0.00583	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0183	0.0592	<0.005	0.00932	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005
VOA	8260B	CHLOROFORM	mg/L	1.0E-01	NA	<0.005	<0.05	0.0295	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	0.0191	<0.005	<0.005	<0.005	<0.005	<0.005	0.0122	<0.005	<0.005
VOA	8260B	CIS-1,2-DICHLOROETHENE	mg/L	7.0E-02	NA	<0.005	<0.05	<0.2	0.000552	0.000521	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.019	<0.1	0.000484	0.0258	0.000736	<0.005	0.000281	0.00891	<0.005	<0.005
VOA	8260B	ETHYLBENZENE	mg/L	7.0E-01	NA	<0.005	<0.05	<0.2	<0.005	0.00117	0.00288	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.1	0.00095	0.00186	<0.005	0.0291	<0.005	<0.05	0.00141	<0.005
VOA	8260B	METHYL ETHYL KETONE	mg/L	1.9E-01	NA	<0.005	<0.05	<0.2	<0.005	<0.005	0.000486	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.025	<0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005
VOA	8260B	TETRACHLOROETHENE	mg/L	5.0E-03	NA	<0.005	<0.05	<0.2	<0.005	0.000749	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00135	<0.1	0.00119	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005
VOA	8260B	TOLUENE	mg/L	1.0E+00	7.4E+00	<0.005	8.27	8.82	0.0603	<0.005	0.000824	<0.005	<0.005	<0.005	<0.005	<0.005	0.00118	0.00313	<0.1	0.0021	0.000462	0.00092	0.00821	<0.005	<0.05	0.000901	<0.005
VOA	8260B	TRANS-1,2-DICHLOROETHENE	mg/L	1.0E-01	NA	<0.005	<0.05	<0.2	0.00724	0.00122	0.00428	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0822	0.0732	0.00102	0.00193	<0.005	0.0148	0.000516	0.0185	0.00434	<0.005
VOA	8260B	TRICHLOROETHENE	mg/L	5.0E-03	3.7E-02	<0.005	<0.05	<0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00835	<0.1	<0.005	0.000387	0.000718	<0.005	<0.005	<0.05	<0.005	<0.005
VOA	8260B	VINYL CHLORIDE	mg/L	2.0E-03	1.5E-02	<0.002	<0.02	<0.08	0.00144	0.00147	0.000695	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.256	0.202	0.00105	0.00413	0.00149	<0.002	<0.002	0.0165	<0.002	<0.002
VOA	8260B	XYLENES (TOTAL)	mg/L	1.0E+01	NA	<0.01	<0.1	<0.4	<0.01	0.00115	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.2	<0.01	<0.01	<0.01	0.0352	<0.01	<0.1	<0.01	<0.01

MO-1 CLEANUP LEVELS STOPLIGHT LEGEND



Concentration exceeds MO-1 RS

Detection limit doesn't meet MO-1 RS

Detection limit and/or concentration meets MO-1 RS

Notes:

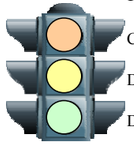
1 Louisiana RECAP Groundwater Screening Standard
2 Louisiana RECAP Groundwater Management Option 1 (MO-1) Standard
NA Not Applicable, concentrations of constituent do not exceed respective RECAP GW_SS
Therefore, constistuent does not require futher risk evaluation under MO-1

Table 3

Validated Groundwater Analytical Results, October 2010
Upper Water-Bearing Zone
Combustion, Inc. Site
Livingston Parish, Louisiana

Chemical Group	Method	Chemical	Units	RECAP GW_SS[1]	Limiting MO-1 RECAP Standard[2]	MW-201	MW-201 FD	MW-203	MW-204S	MW-205S	MW-206S	MW-207S	MW-208S	MW-209S	MW-213S	PW-01	PW-01S	PW-02	PW-03	PW-04	PW-05	PW-06	PW-08	PW-12	PW-13
TDA	8270	2,4/2,6-TOLUENEDIAMINE	mg/L	1.0E-02	1.0E-02	5.48	6.4	0.416	0.548	28	<0.0102	<0.0108	<0.0103	<0.0105	19.8	1.51	1.21	1.36	5.94	1.23	10.1	0.852	<0.0102	4.34	<0.0114
TDA	8270	O AND/OR P -TOLUIDINE	mg/L	1.0E-02	1.0E-02	0.0909	0.069	0.0316	0.0151	0.314	<0.00204	<0.00215	0.000531	<0.00211	0.306	0.0212	0.0155	0.117	0.31	<0.211	0.413	0.00715	<0.00204	0.0552	<0.00227
VOA	8260B	1,1,2-TRICHLOROETHANE	mg/L	5.0E-03	3.7E-02	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.024	0.0358	<0.005	<0.005	<0.005	<0.005	<0.005	0.0216	<0.005	<0.005
VOA	8260B	1,1-DICHLOROETHANE	mg/L	8.1E-02	6.0E+00	<0.01	<0.01	0.00746	0.0938	0.529	<0.005	<0.005	0.00119	<0.005	0.00913	2.78	5.67	0.0231	0.179	0.0188	0.00929	0.0655	1.16	0.0629	<0.005
VOA	8260B	1,1-DICHLOROETHENE	mg/L	7.0E-03	5.2E-02	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0641	0.175	<0.005	<0.005	<0.005	<0.005	0.00174	0.0475	<0.005	<0.005
VOA	8260B	1,2-DICHLOROETHANE	mg/L	5.0E-03	3.7E-02	<0.01	<0.01	0.00233	<0.005	<0.005	0.00517	<0.005	<0.005	0.00286	<0.005	0.942	2.06	<0.005	<0.005	<0.005	<0.005	0.0152	1.25	0.00472	<0.005
VOA	8260B	BENZENE	mg/L	5.0E-03	3.7E-02	0.0143	0.0117	0.00284	0.00407	0.0369	<0.005	<0.005	<0.005	<0.005	<0.005	0.00267	<0.05	0.00286	0.0615	0.00231	0.0131	<0.005	0.00474	0.00798	<0.005
VOA	8260B	CHLOROBENZENE	mg/L	1.0E-01	NA	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	0.000439	<0.005
VOA	8260B	CHLOROETHANE	mg/L	1.0E-02	2.8E-02	<0.01	<0.01	<0.005	<0.005	0.00669	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	0.0119	<0.005	<0.005	<0.005	0.00808	<0.005	<0.005
VOA	8260B	CIS-1,2-DICHLOROETHENE	mg/L	7.0E-02	NA	<0.01	<0.01	<0.005	0.0021	<0.005	<0.005	<0.005	<0.005	<0.005	0.000725	0.0045	0.0105	0.00256	0.0104	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
VOA	8260B	ETHYLBENZENE	mg/L	7.0E-01	NA	0.00152	<0.01	0.00168	<0.005	0.00683	<0.005	<0.005	<0.005	<0.005	0.00149	<0.01	<0.05	<0.005	0.00336	<0.005	0.0174	<0.005	<0.01	0.00168	<0.005
VOA	8260B	TOLUENE	mg/L	1.0E+00	7.4E+00	1.99	1.29	0.186	<0.005	<0.005	<0.005	<0.005	<0.005	0.000532	0.00172	0.00185	<0.05	<0.005	<0.005	<0.005	0.00714	<0.005	<0.01	0.00133	<0.005
VOA	8260B	TRANS-1,2-DICHLOROETHENE	mg/L	1.0E-01	NA	<0.01	<0.01	0.00888	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.05	<0.005	<0.005	<0.005	0.0126	<0.005	<0.01	<0.005	<0.005
VOA	8260B	TRICHLOROETHENE	mg/L	5.0E-03	NA	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00217	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	0.00233	<0.005	<0.005
VOA	8260B	VINYL CHLORIDE	mg/L	2.0E-03	1.5E-02	<0.004	<0.004	0.00159	0.00175	0.00116	<0.002	<0.002	<0.002	<0.002	<0.002	0.12	0.221	<0.002	0.00264	<0.002	<0.002	<0.002	0.00901	<0.002	<0.002
VOA	8260B	XYLENES (TOTAL)	mg/L	1.0E+01	NA	0.0153	<0.02	0.00949	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.1	<0.01	<0.01	<0.01	0.0263	<0.01	<0.02	<0.01	<0.01

MO-1 CLEANUP LEVELS STOPLIGHT LEGEND



Concentration exceeds MO-1 RS

Detection limit doesn't meet MO-1 RS

Detection limit and/or concentration meets MO-1 RS

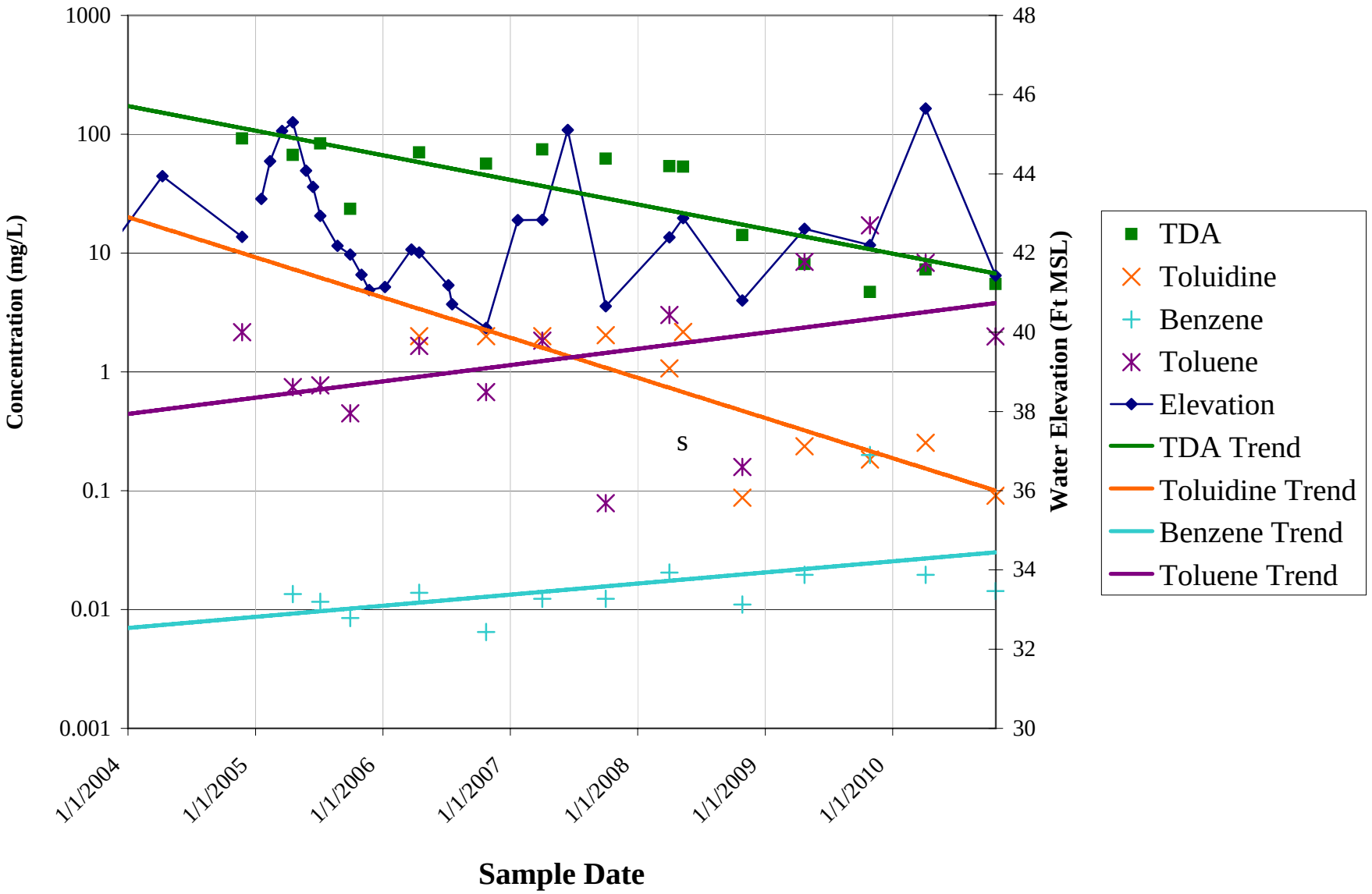
Notes:

1 Louisiana RECAP Groundwater Screening Standard
2 Louisiana RECAP Groundwater Management Option 1 (MO-1) Standard
NA Not Applicable, concentrations of constituent do not exceed respective RECAP GW_SS
Therefore, constistuent does not require futher risk evaluation under MO-1

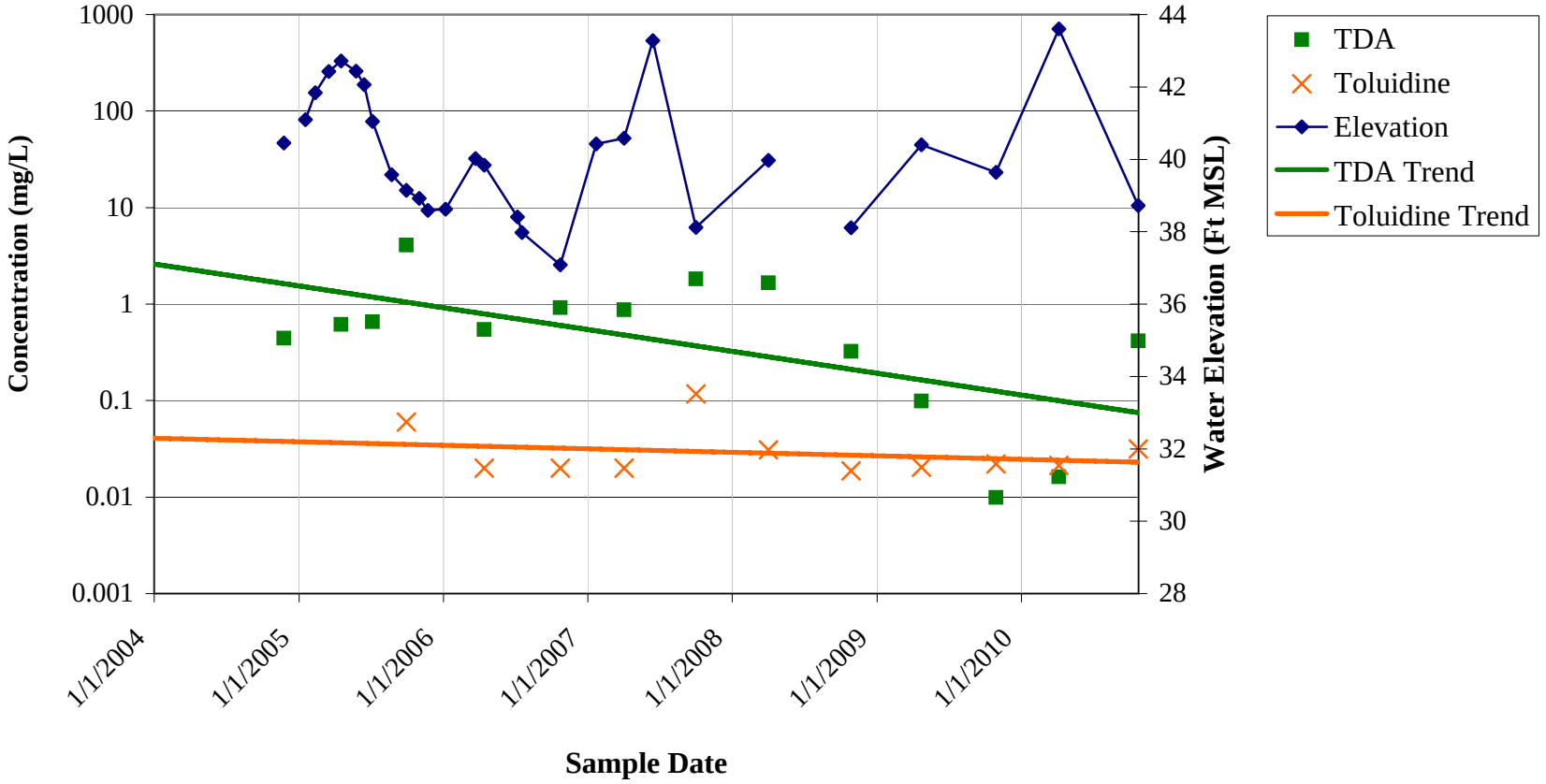
ATTACHMENT 1

EXPANDED CONCENTRATION TREND CHARTS

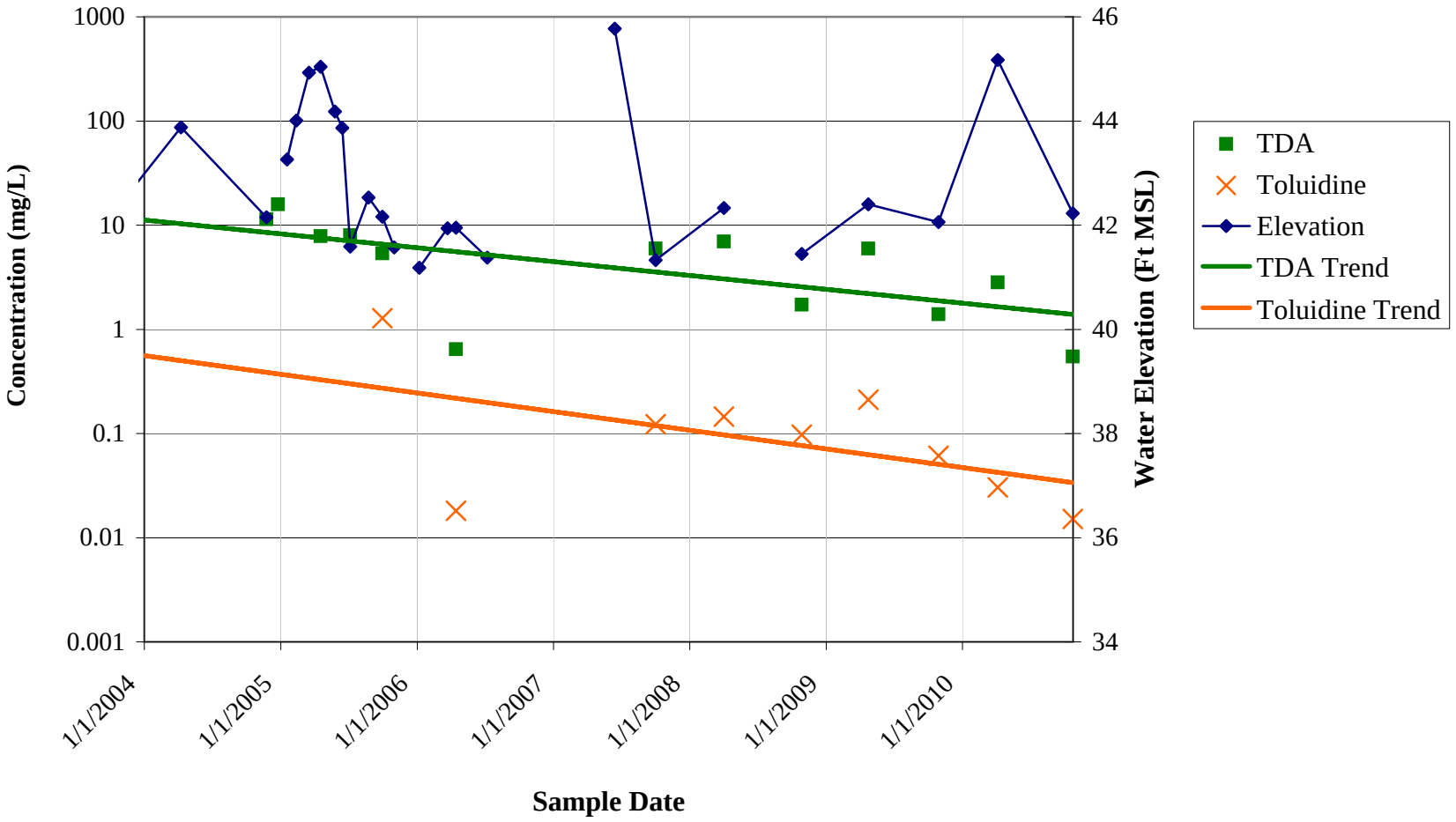
MW-201


Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Water Elevation (Ft MSL)
48
46
44
42
40
38
36
34
32
30
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Benzene
Toluene
Elevation
TDA Trend
Toluidine Trend
Benzene Trend
Toluene Trend

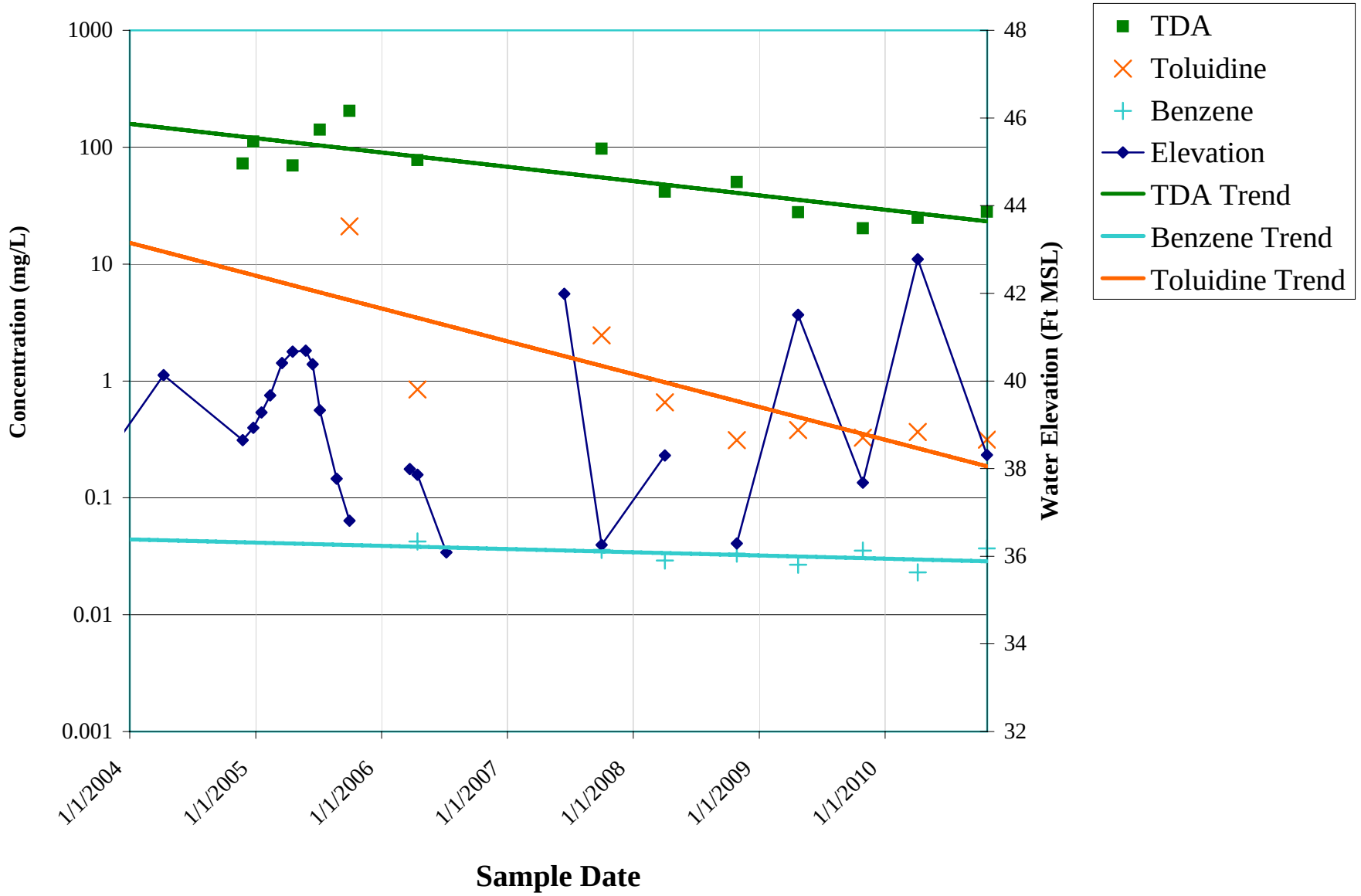
MW-203


Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Water Elevation (Ft MSL)
44
42
40
38
36
34
32
30
28
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Elevation
TDA Trend
Toluidine Trend

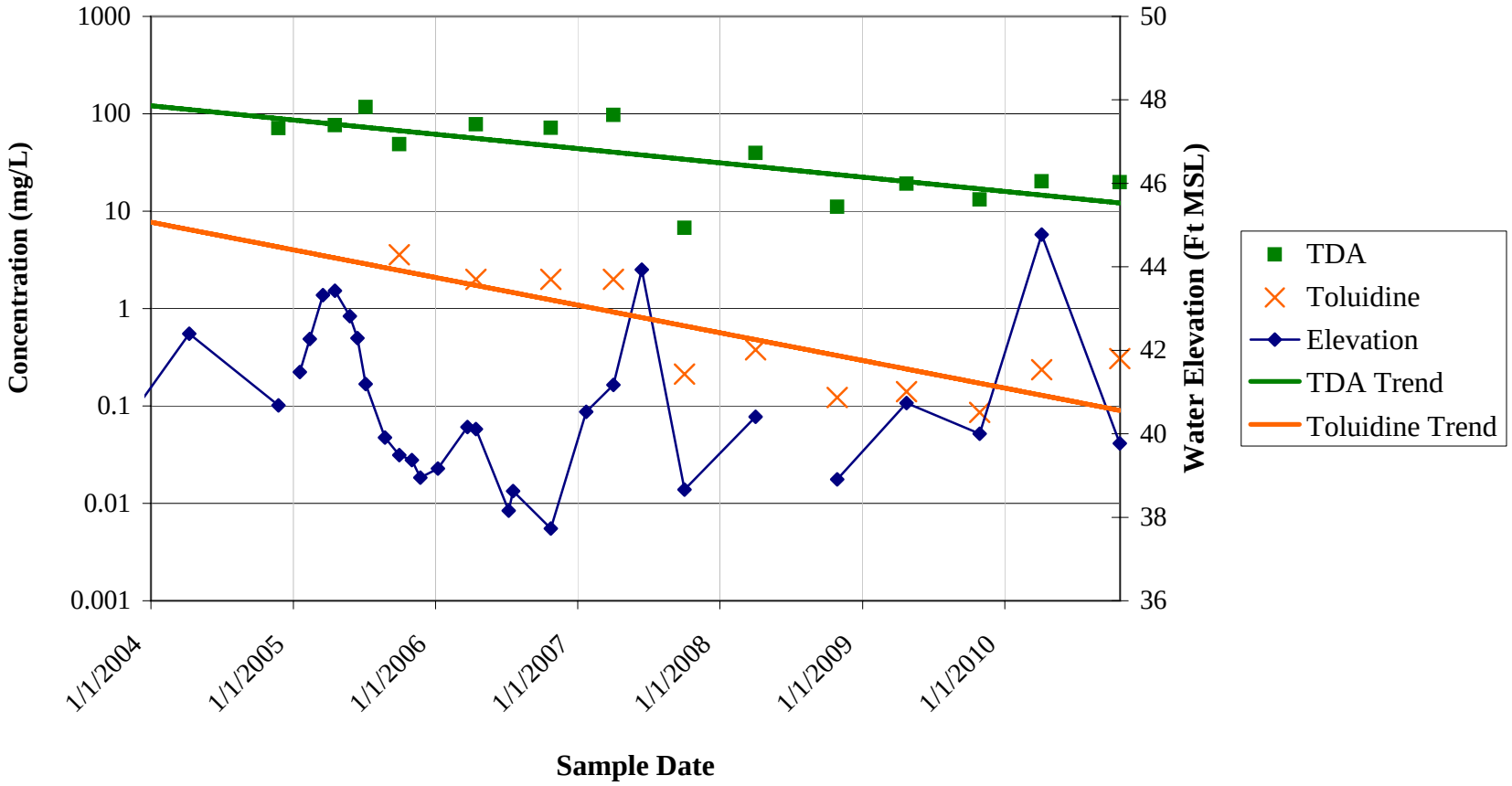
MW-204S


Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Water Elevation (Ft MSL)
46
44
42
40
38
36
34
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Elevation
TDA Trend
Toluidine Trend

MW-205S


Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Water Elevation (Ft MSL)
48
46
44
42
40
38
36
34
32
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Benzene
Elevation
TDA Trend
Benzene Trend
Toluidine Trend

MW-213S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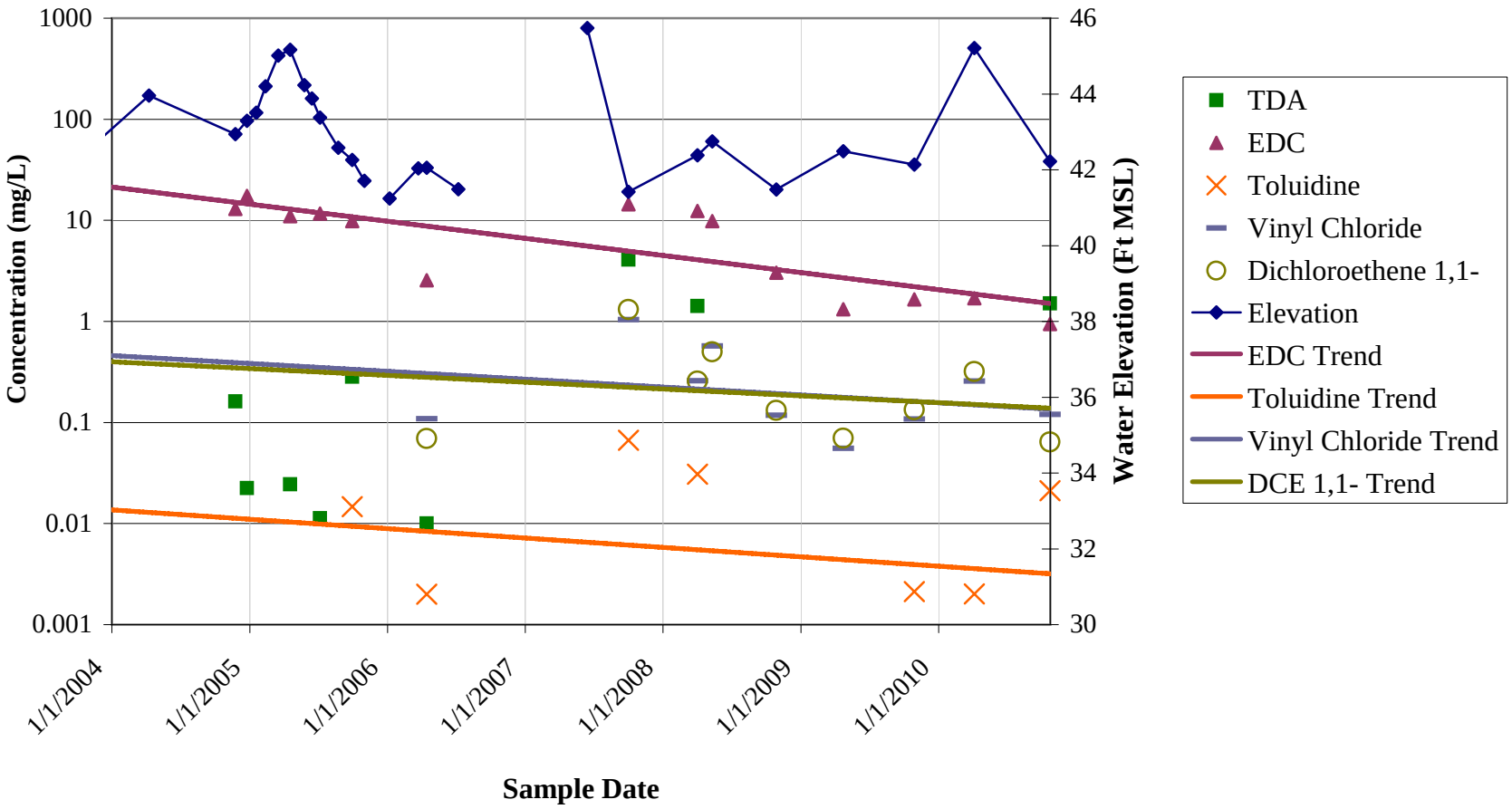
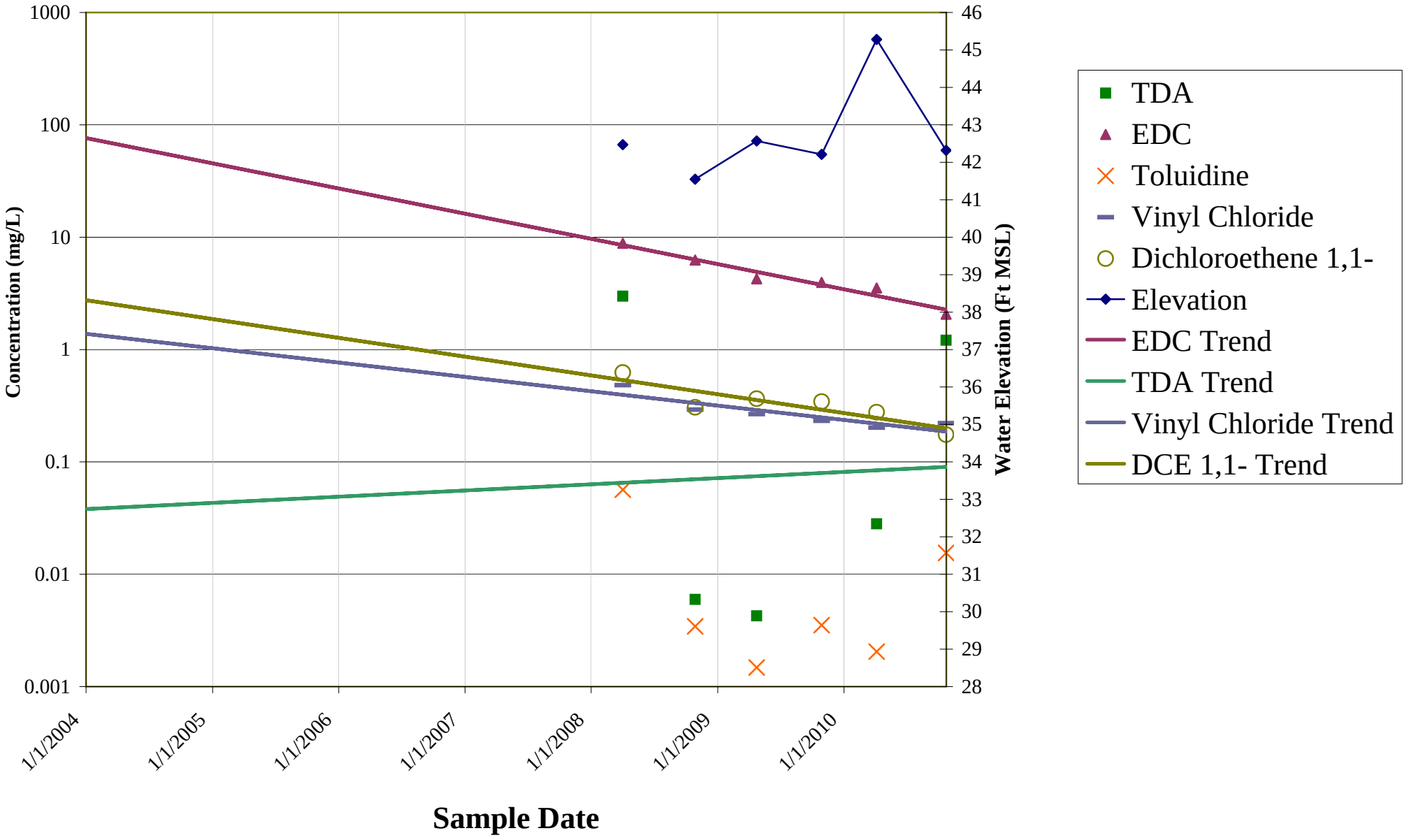
100
10
1
0.1
0.01
0.001
Concentration (mg/L)
50
48
46
44
42
40
38
36
Water Elevation (Ft MSL)
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Elevation
TDA Trend
Toluidine Trend

PW-01


Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Water Elevation (Ft MSL)
46
44
42
40
38
36
34
32
30
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
EDC
Toluidine
Vinyl Chloride
Dichloroethene 1,1-
Elevation
EDC Trend
Toluidine Trend
Vinyl Chloride Trend
DCE 1,1- Trend

PW-01S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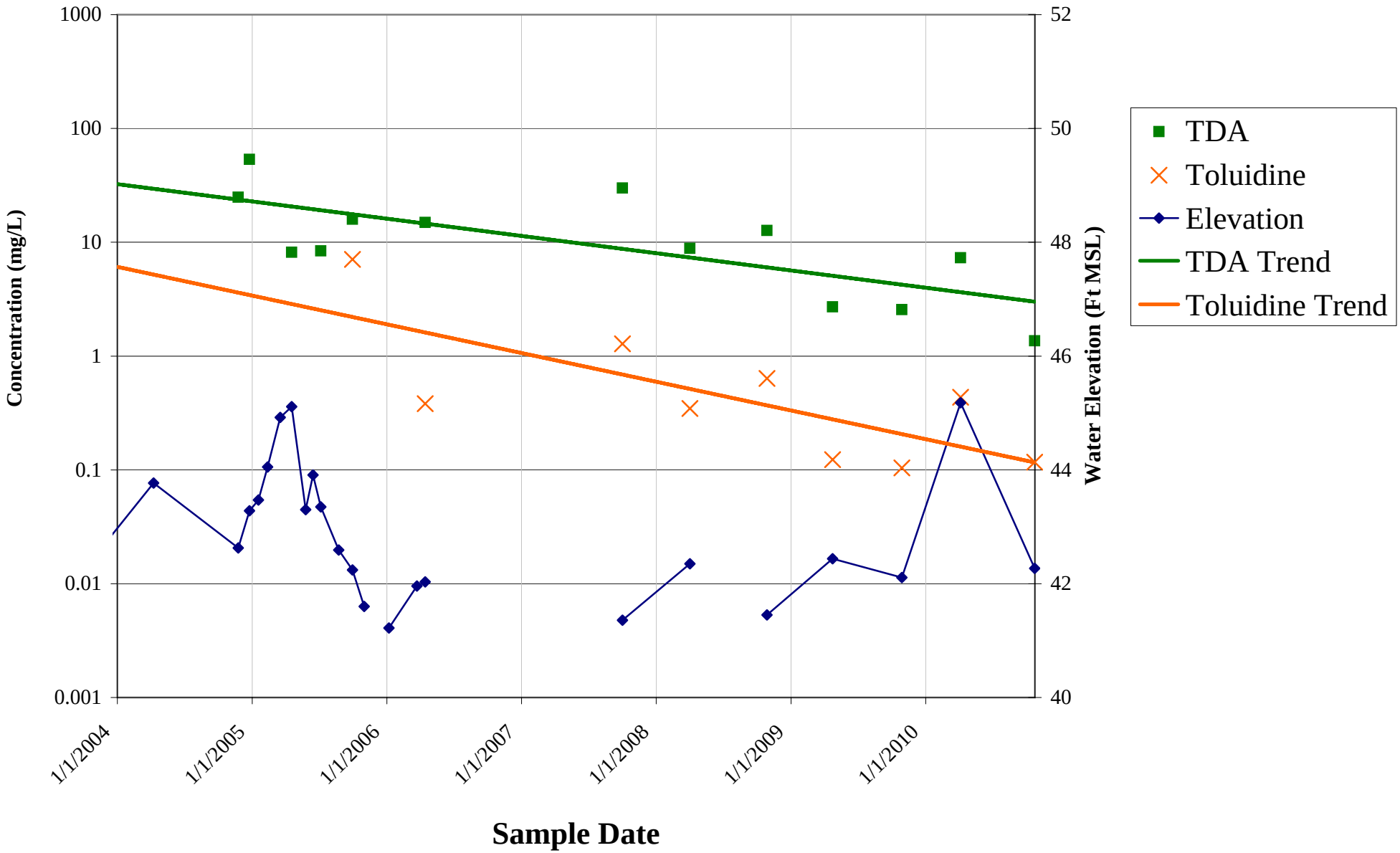
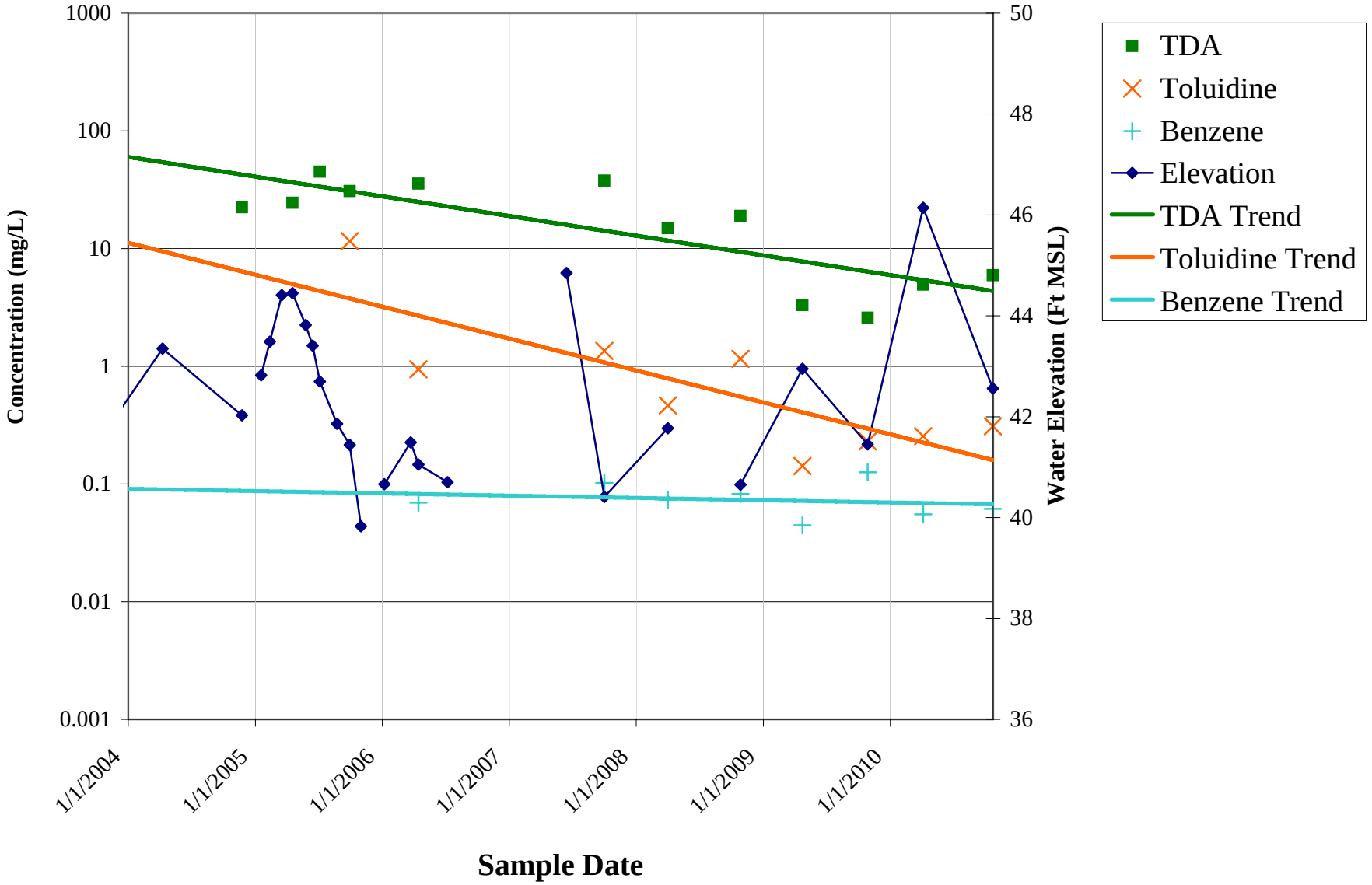
100
10
1
0.1
0.01
0.001
Concentration (mg/L)
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
30
29
28
Water Elevation (Ft MSL)
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
EDC
Toluidine
Vinyl Chloride
Dichloroethene 1,1-
Elevation
EDC Trend
TDA Trend
Vinyl Chloride Trend
DCE 1,1- Trend

PW-02


1000
100
10
1
0.1
0.01
0.001
Concentration (mg/L)
52
50
48
46
44
42
40
Water Elevation (Ft MSL)
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Elevation
TDA Trend
Toluidine Trend

PW-03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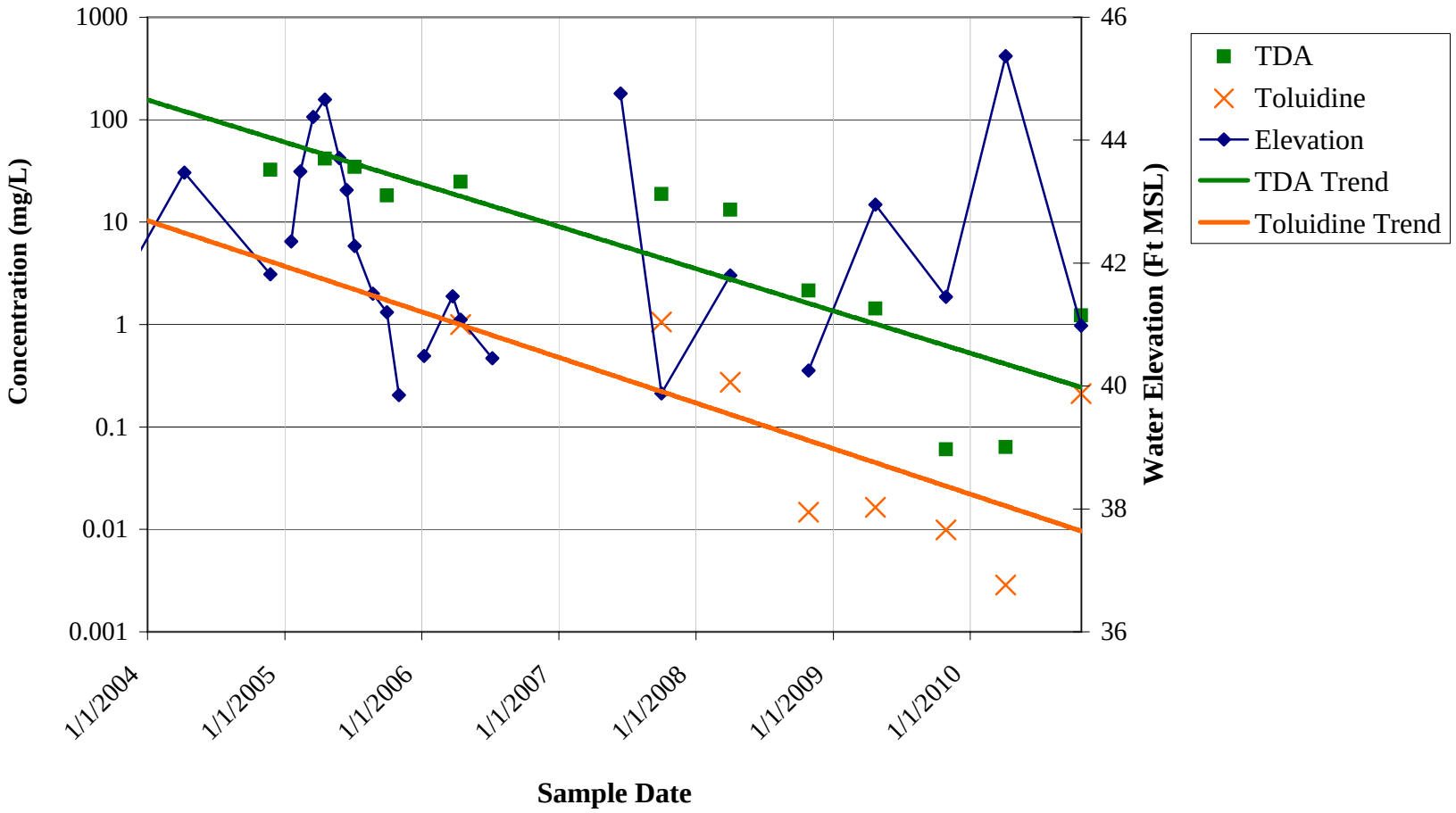
100
10
1
0.1
0.01
0.001
Concentration (mg/L)
50
48
46
44
42
40
38
36
Water Elevation (Ft MSL)
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Benzene
Elevation
TDA Trend
Toluidine Trend
Benzene Trend

PW-04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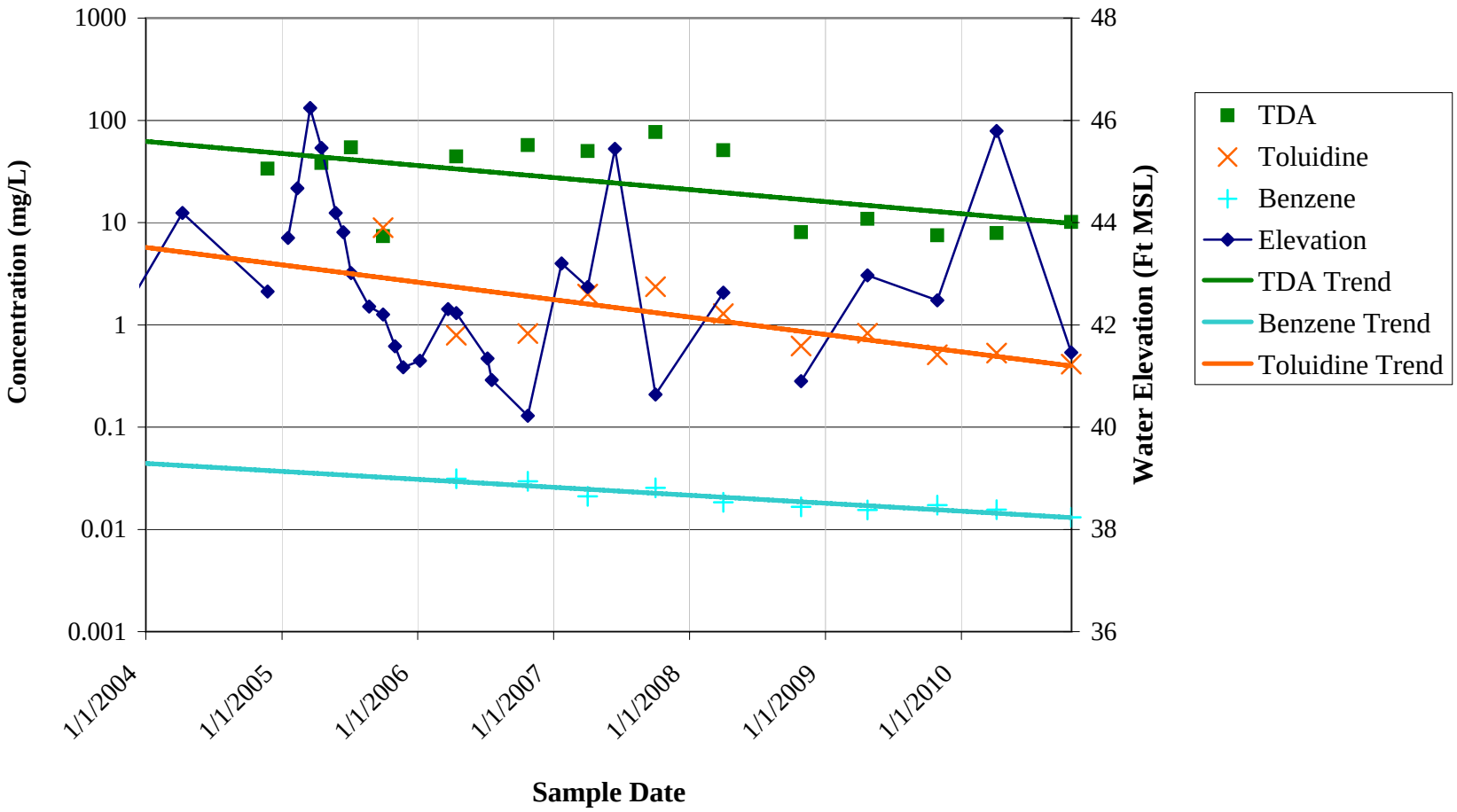
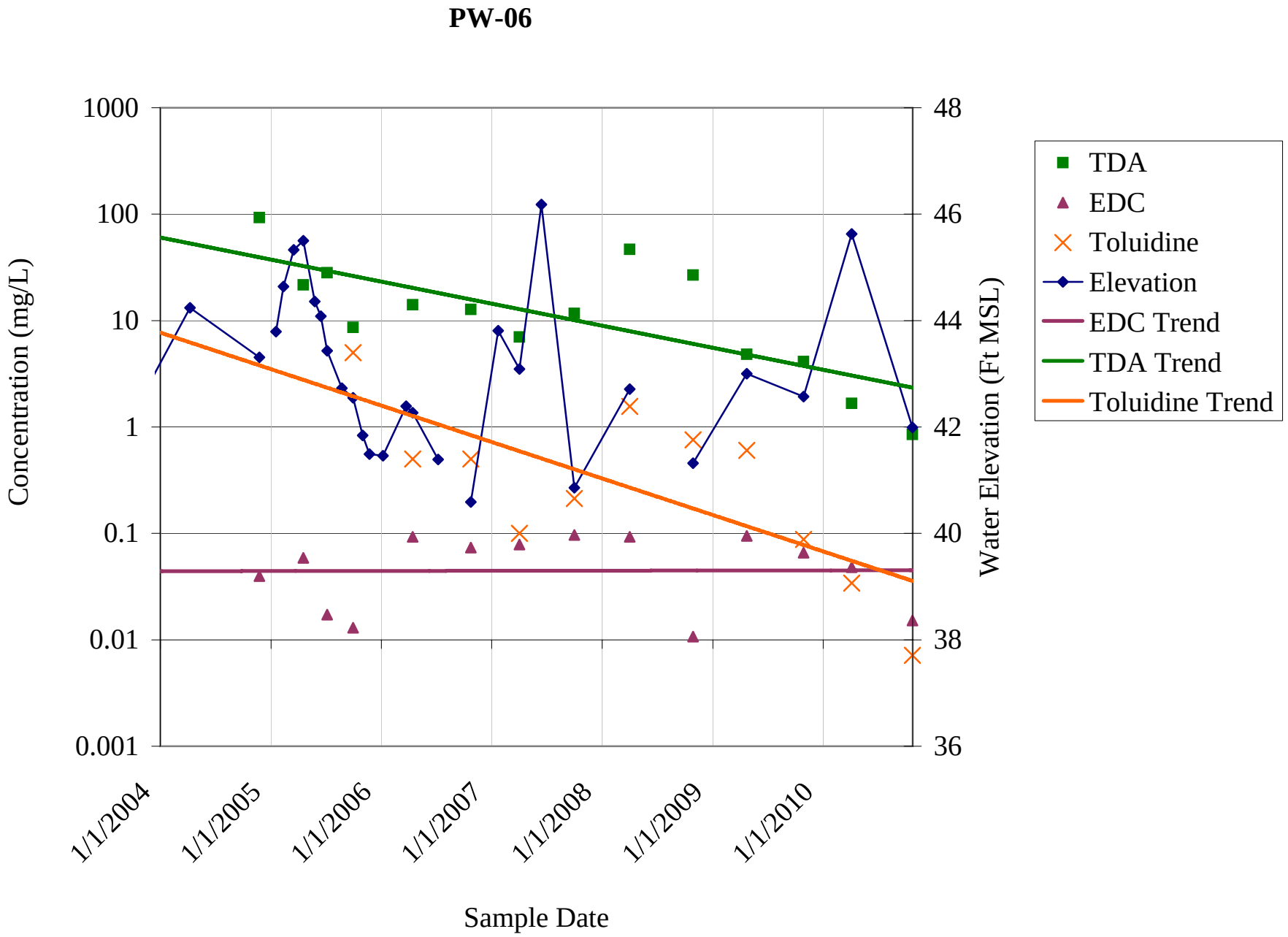
100
10
1
0.1
0.01
0.001
Concentration (mg/L)
46
44
42
40
38
36
Water Elevation (Ft MSL)
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Elevation
TDA Trend
Toluidine Trend

PW-05


1000
100
10
1
0.1
0.01
0.001
48
46
44
42
40
38
36
Concentration (mg/L)
Water Elevation (Ft MSL)
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Benzene
Elevation
TDA Trend
Benzene Trend
Toluidine Trend


PW-06
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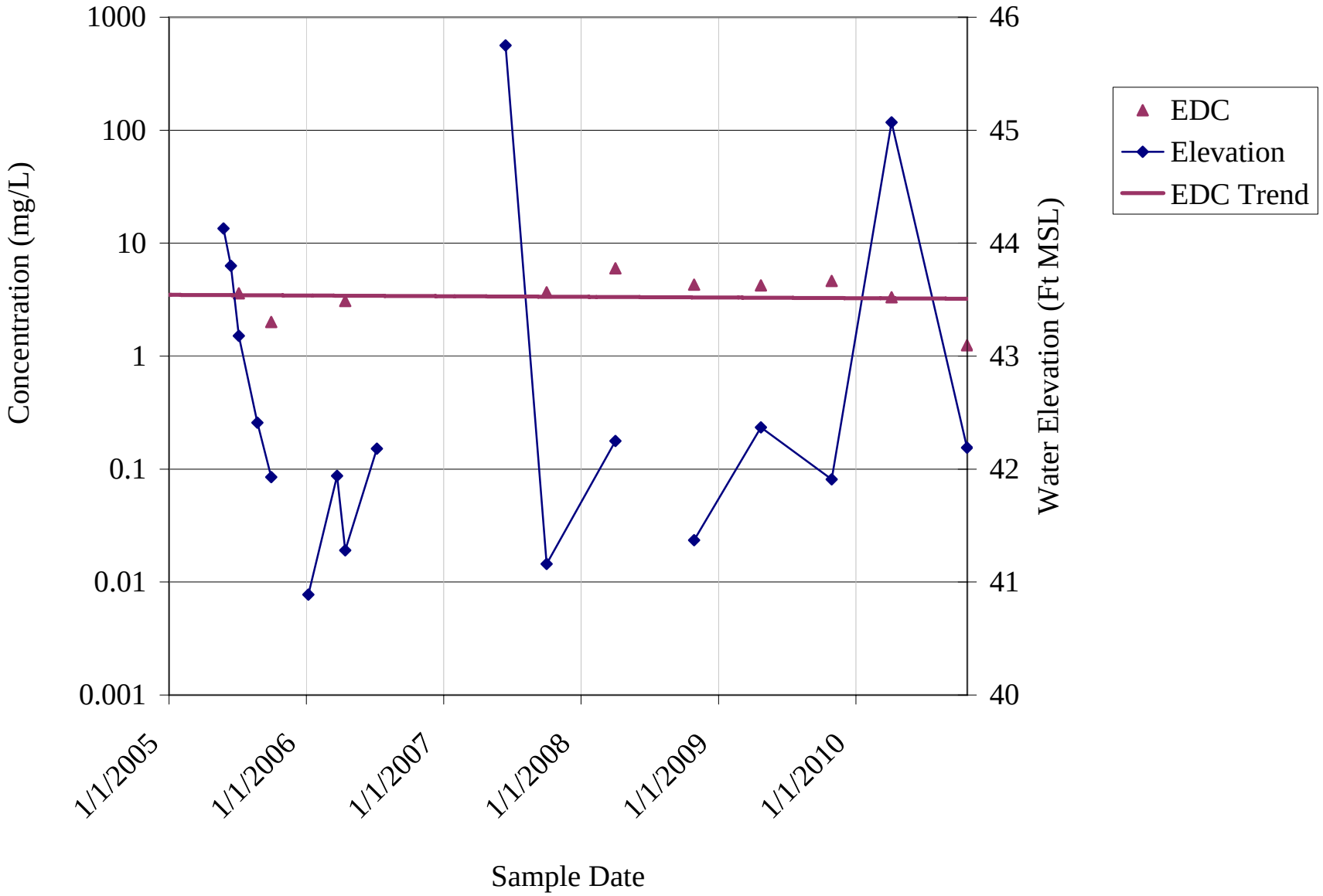
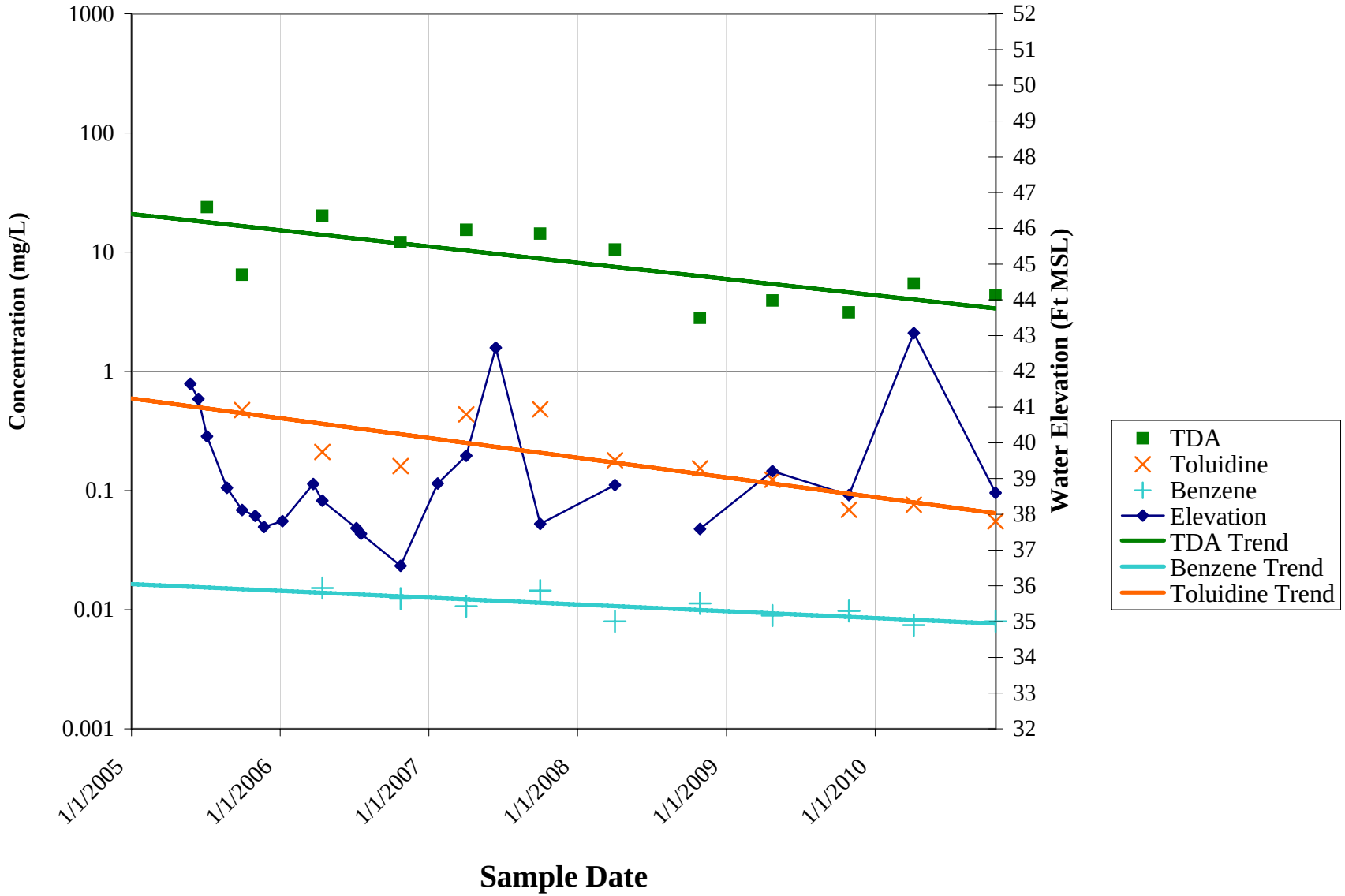
100
10
1
0.1
0.01
0.001
Concentration (mg/L)
48
46
44
42
40
38
36
Water Elevation (Ft MSL)
1/1/2004
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
EDC
Toluidine
Elevation
EDC Trend
TDA Trend
Toluidine Trend

PW-08


1000
100
10
1
0.1
0.01
0.001
Concentration (mg/L)
46
45
44
43
42
41
40
Water Elevation (Ft MSL)
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
EDC
Elevation
EDC Trend

PW-12


Concentration (mg/L)
1000
100
10
1
0.1
0.01
0.001
Water Elevation (Ft MSL)
52
51
50
49
48
47
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
1/1/2005
1/1/2006
1/1/2007
1/1/2008
1/1/2009
1/1/2010
Sample Date
TDA
Toluidine
Benzene
Elevation
TDA Trend
Benzene Trend
Toluidine Trend

ATTACHMENT 2

UPDATED CLEANUP LEVEL CONCENTRATION CALCULATIONS

RECAP FORM 15
SCREENING OPTION SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q2

GROUNDWATER - Identification of the SO SS:

COC	GW_{SS} (mg/l)
2,4/2,6-TOLUENEDIAMINE	1.0E-02
O AND/OR P -TOLUIDINE	1.0E-02
TRICHLOROETHANE,1,1,2-	5.0E-03
DICHLOROETHANE,1,1-	8.1E-02
DICHLOROETHENE,1,1-	7.0E-03
DICHLOROETHANE,1,2-	5.0E-03
BENZENE	5.0E-03
CHLOROBENZENE	1.0E-01
CHLOROETHANE (ETHYLCHLORIDE)	1.0E-02
CHLOROFORM	1.0E-01
DICHLOROETHENE,CIS,1,2-	7.0E-02
ETHYL BENZENE	7.0E-01
METHYLENE CHLORIDE	5.0E-03
TETRACHLOROETHYLENE	5.0E-03
TOLUENE	1.0E+00
DICHLOROETHENE,TRANS,1,2-	1.0E-01
TRICHLOROETHENE	5.0E-03
VINYL CHLORIDE	2.0E-03
XYLENE(MIXED)	1.0E+01

RECAP FORM 15
SCREENING OPTION SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q2

GROUNDWATER - Compliance Concentration:

COC	Compliance Concentration (mg/l)
2,4/2,6-TOLUENEDIAMINE	2.5E+01
O AND/OR P -TOLUIDINE	5.3E-01
TRICHLOROETHANE,1,1,2-	1.1E-01
DICHLOROETHANE,1,1-	9.3E+00
DICHLOROETHENE,1,1-	3.2E-01
DICHLOROETHANE,1,2-	3.5E+00
BENZENE	5.5E-02
CHLOROBENZENE	2.5E-03
CHLOROETHANE (ETHYLCHLORIDE)	5.9E-02
CHLOROFORM	3.0E-02
DICHLOROETHENE,CIS,1,2-	2.6E-02
ETHYL BENZENE	2.9E-02
METHYLENE CHLORIDE	4.9E-04
TETRACHLOROETHYLENE	1.4E-03
TOLUENE	8.8E+00
DICHLOROETHENE,TRANS,1,2-	8.2E-02
TRICHLOROETHENE	8.4E-03
VINYL CHLORIDE	2.6E-01
XYLENE(MIXED)	3.5E-02

RECAP FORM 15
SCREENING OPTION SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q2

SO GROUNDWATER RECAP ASSESSMENT:

COC	GW_{SS} (mg/l)	Compliance Concentration (mg/l)	CC Exceeds SS?
2,4/2,6-TOLUENEDIAMINE	1.0E-02	2.5E+01	Yes
O AND/OR P -TOLUIDINE	1.0E-02	5.3E-01	Yes
TRICHLOROETHANE,1,1,2-	5.0E-03	1.1E-01	Yes
DICHLOROETHANE,1,1-	8.1E-02	9.3E+00	Yes
DICHLOROETHENE,1,1-	7.0E-03	3.2E-01	Yes
DICHLOROETHANE,1,2-	5.0E-03	3.5E+00	Yes
BENZENE	5.0E-03	5.5E-02	Yes
CHLOROBENZENE	1.0E-01	2.5E-03	No
CHLOROETHANE (ETHYLCHLORIDE)	1.0E-02	5.9E-02	Yes
CHLOROFORM	1.0E-01	3.0E-02	No
DICHLOROETHENE,CIS,1,2-	7.0E-02	2.6E-02	No
ETHYL BENZENE	7.0E-01	2.9E-02	No
METHYLENE CHLORIDE	5.0E-03	4.9E-04	No
TETRACHLOROETHYLENE	5.0E-03	1.4E-03	No
TOLUENE	1.0E+00	8.8E+00	Yes
DICHLOROETHENE,TRANS,1,2-	1.0E-01	8.2E-02	No
TRICHLOROETHENE	5.0E-03	8.4E-03	Yes
VINYL CHLORIDE	2.0E-03	2.6E-01	Yes
XYLENE(MIXED)	1.0E+01	3.5E-02	No

RECAP FORM 16
MANAGEMENT OPTION 1 SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q2

GROUNDWATER - Identification of the Limiting MO-1 RS:

COC	☐ GW_1 ☑ GW_2 ☐ GW_{3DW} ☐ GW_{3NDW}	☐ NO DF ☑ DF2 ☐ DF3 ☐ DF3	Additivity Factor	Final ☐ GW_1 ☑ GW_2 ☐ GW_{3DW} ☐ GW_{3NDW}	☑ GW_{es}	☑ GW_{air}	$Water_{sol}$	Limiting MO-1 RS
2,4/2,6-TOLUENEDIAMINE	1.0E-02	NA	1	1.0E-02	NA	NA	3.4E+04	1.0E-02
O AND/OR P -TOLUIDINE	1.0E-02	NA	1	1.0E-02	NA	NA	1.7E+04	1.0E-02
TRICHLOROETHANE,1,1,2-	5.0E-03	7.4	1	3.7E-02	8.4E+00	6.2E+02	4.4E+03	3.7E-02
DICHLOROETHANE,1,1-	8.1E-01	7.4	1	6.0E+00	1.4E+02	1.7E+04	5.1E+03	6.0E+00
DICHLOROETHENE,1,1-	7.0E-03	7.4	1	5.2E-02	1.8E+01	4.0E+03	2.3E+03	5.2E-02
DICHLOROETHANE,1,2-	5.0E-03	7.4	1	3.7E-02	3.6E+00	2.8E+02	8.5E+03	3.7E-02
BENZENE	5.0E-03	7.4	1	3.7E-02	2.9E+00	3.9E+02	1.8E+03	3.7E-02
CHLOROETHANE (ETHYLCHLORIDE)	3.8E-03	7.4	1	2.8E-02	5.1E+03	1.1E+06	5.7E+03	2.8E-02
TOLUENE	1.0E+00	7.4	1	7.4E+00	8.9E+01	1.3E+04	5.3E+02	7.4E+00
TRICHLOROETHENE	5.0E-03	7.4	1	3.7E-02	1.0E+01	1.7E+03	1.1E+03	3.7E-02
VINYL CHLORIDE	2.0E-03	7.4	1	1.5E-02	2.0E-01	6.0E+01	2.8E+03	1.5E-02

Calculation Notes:
POC to POE = 425 Ft, Sd = 18 ft, DF2 = 7.4
For TDA and o-toluidine, GW2 multiplied by DF2 is less than the GW1, default to GW1 (reporting limit)

RECAP FORM 16
MANAGEMENT OPTION 1 SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q2

GROUNDWATER - Compliance Concentration:

COC	Compliance Concentration	Target Organ
2,4/2,6-TOLUENEDIAMINE	2.5E+01	Carcinogenic
O AND/OR P -TOLUIDINE	5.3E-01	Carcinogenic
TRICHLOROETHANE,1,1,2-	1.1E-01	Based on MCL; additivity does not apply
DICHLOROETHANE,1,1-	9.3E+00	Liver; Kidney; Respiratory System; Central Nervous System; Skin
DICHLOROETHENE,1,1-	3.2E-01	Based on MCL; additivity does not apply
DICHLOROETHANE,1,2-	3.5E+00	Based on MCL; additivity does not apply
BENZENE	5.5E-02	Based on MCL; additivity does not apply
CHLOROETHANE (ETHYLCHLORIDE)	5.9E-02	Fetal Toxicity
TOLUENE	8.8E+00	Liver effects, Kidney effects, Central Nervous System
TRICHLOROETHENE	8.4E-03	Based on MCL; additivity does not apply
VINYL CHLORIDE	2.6E-01	Based on MCL; additivity does not apply

MO-1 GROUNDWATER RECAP ASSESSMENT:

COC	Limiting MO-1 RS	Compliance Concentration	CC Exceeds MO-1 LRS?	Risk Ratio
2,4/2,6-TOLUENEDIAMINE	1.0E-02	2.5E+01	Yes	2480
O AND/OR P -TOLUIDINE	1.0E-02	5.3E-01	Yes	53
TRICHLOROETHANE,1,1,2-	3.7E-02	1.1E-01	Yes	3
DICHLOROETHANE,1,1-	6.0E+00	9.3E+00	Yes	2
DICHLOROETHENE,1,1-	5.2E-02	3.2E-01	Yes	6
DICHLOROETHANE,1,2-	3.7E-02	3.5E+00	Yes	95
BENZENE	3.7E-02	5.5E-02	Yes	1
CHLOROETHANE (ETHYLCHLORIDE)	2.8E-02	5.9E-02	Yes	2
TOLUENE	7.4E+00	8.8E+00	Yes	1
TRICHLOROETHENE	3.7E-02	8.4E-03	No	--
VINYL CHLORIDE	1.5E-02	2.6E-01	Yes	17

RECAP FORM 15
SCREENING OPTION SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q4

GROUNDWATER - Identification of the SO SS:

COC	GW_{SS} (mg/l)
2,4/2,6-TOLUENEDIAMINE	1.0E-02
O AND/OR P -TOLUIDINE	1.0E-02
TRICHLOROETHANE,1,1,2-	5.0E-03
DICHLOROETHANE,1,1-	8.1E-02
DICHLOROETHENE,1,1-	7.0E-03
DICHLOROETHANE,1,2-	5.0E-03
BENZENE	5.0E-03
CHLOROBENZENE	1.0E-01
CHLOROETHANE (ETHYLCHLORIDE)	1.0E-02
DICHLOROETHENE,CIS,1,2-	7.0E-02
ETHYL BENZENE	7.0E-01
TOLUENE	1.0E+00
DICHLOROETHENE,TRANS,1,2-	1.0E-01
TRICHLOROETHENE	5.0E-03
VINYL CHLORIDE	2.0E-03
XYLENE(MIXED)	1.0E+01

RECAP FORM 15
SCREENING OPTION SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q4

GROUNDWATER - Compliance Concentration:

COC	Compliance Concentration (mg/l)
2,4/2,6-TOLUENEDIAMINE	2.8E+01
O AND/OR P -TOLUIDINE	4.1E-01
TRICHLOROETHANE,1,1,2-	3.6E-02
DICHLOROETHANE,1,1-	5.7E+00
DICHLOROETHENE,1,1-	1.8E-01
DICHLOROETHANE,1,2-	2.1E+00
BENZENE	6.2E-02
CHLOROBENZENE	4.4E-04
CHLOROETHANE (ETHYLCHLORIDE)	1.2E-02
DICHLOROETHENE,CIS,1,2-	1.1E-02
ETHYL BENZENE	1.7E-02
TOLUENE	2.0E+00
DICHLOROETHENE,TRANS,1,2-	1.3E-02
TRICHLOROETHENE	2.3E-03
VINYL CHLORIDE	2.2E-01
XYLENE(MIXED)	2.6E-02

RECAP FORM 15
SCREENING OPTION SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q4

SO GROUNDWATER RECAP ASSESSMENT:

COC	GW_{SS} (mg/l)	Compliance Concentration (mg/l)	CC Exceeds SS?
2,4/2,6-TOLUENEDIAMINE	1.0E-02	2.8E+01	Yes
O AND/OR P -TOLUIDINE	1.0E-02	4.1E-01	Yes
TRICHLOROETHANE,1,1,2-	5.0E-03	3.6E-02	Yes
DICHLOROETHANE,1,1-	8.1E-02	5.7E+00	Yes
DICHLOROETHENE,1,1-	7.0E-03	1.8E-01	Yes
DICHLOROETHANE,1,2-	5.0E-03	2.1E+00	Yes
BENZENE	5.0E-03	6.2E-02	Yes
CHLOROBENZENE	1.0E-01	4.4E-04	No
CHLOROETHANE (ETHYLCHLORIDE)	1.0E-02	1.2E-02	Yes
DICHLOROETHENE,CIS,1,2-	7.0E-02	1.1E-02	No
ETHYL BENZENE	7.0E-01	1.7E-02	No
TOLUENE	1.0E+00	2.0E+00	Yes
DICHLOROETHENE,TRANS,1,2-	1.0E-01	1.3E-02	No
TRICHLOROETHENE	5.0E-03	2.3E-03	No
VINYL CHLORIDE	2.0E-03	2.2E-01	Yes
XYLENE(MIXED)	1.0E+01	2.6E-02	No

RECAP FORM 16
MANAGEMENT OPTION 1 SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q4

GROUNDWATER - Identification of the Limiting MO-1 RS:

COC	☐ GW_1 ☑ GW_2 ☐ GW_{3DW} ☐ GW_{3NDW}	☐ NO DF ☑ DF2 ☐ DF3 ☐ DF3	Additivity Factor	Final ☐ GW_1 ☑ GW_2 ☐ GW_{3DW} ☐ GW_{3NDW}	☑ GW_{es}	☑ GW_{air}	$Water_{sol}$	Limiting MO-1 RS
2,4/2,6-TOLUENEDIAMINE	1.0E-02	NA	1	1.0E-02	NA	NA	3.4E+04	1.0E-02
O AND/OR P -TOLUIDINE	1.0E-02	NA	1	1.0E-02	NA	NA	1.7E+04	1.0E-02
TRICHLOROETHANE,1,1,2-	5.0E-03	7.4	1	3.7E-02	8.4E+00	6.2E+02	4.4E+03	3.7E-02
DICHLOROETHANE,1,1-	8.1E-01	7.4	1	6.0E+00	1.4E+02	1.7E+04	5.1E+03	6.0E+00
DICHLOROETHENE,1,1-	7.0E-03	7.4	1	5.2E-02	1.8E+01	4.0E+03	2.3E+03	5.2E-02
DICHLOROETHANE,1,2-	5.0E-03	7.4	1	3.7E-02	3.6E+00	2.8E+02	8.5E+03	3.7E-02
BENZENE	5.0E-03	7.4	1	3.7E-02	2.9E+00	3.9E+02	1.8E+03	3.7E-02
CHLOROETHANE (ETHYLCHLORIDE)	3.8E-03	7.4	1	2.8E-02	5.1E+03	1.1E+06	5.7E+03	2.8E-02
TOLUENE	1.0E+00	7.4	1	7.4E+00	8.9E+01	1.3E+04	5.3E+02	7.4E+00
VINYL CHLORIDE	2.0E-03	7.4	1	1.5E-02	2.0E-01	6.0E+01	2.8E+03	1.5E-02

Calculation Notes:
POC to POE = 425 Ft, Sd = 18 ft, DF2 = 7.4
For TDA and o-toluidine, GW2 multiplied by DF2 is less than the GW1, default to GW1 (reporting limit)

RECAP FORM 16
MANAGEMENT OPTION 1 SUBMITTAL FOR GROUNDWATER

Combustion, Inc. Site
Upper Water-Bearing Zone
2010Q4

GROUNDWATER - Compliance Concentration:

COC	Compliance Concentration	Target Organ
2,4/2,6-TOLUENEDIAMINE	2.8E+01	Carcinogenic
O AND/OR P -TOLUIDINE	4.1E-01	Carcinogenic
TRICHLOROETHANE,1,1,2-	3.6E-02	Based on MCL; additivity does not apply
DICHLOROETHANE,1,1-	5.7E+00	Liver; Kidney; Respiratory System; Central Nervous System; Skin
DICHLOROETHENE,1,1-	1.8E-01	Based on MCL; additivity does not apply
DICHLOROETHANE,1,2-	2.1E+00	Based on MCL; additivity does not apply
BENZENE	6.2E-02	Based on MCL; additivity does not apply
CHLOROETHANE (ETHYLCHLORIDE)	1.2E-02	Fetal Toxicity
TOLUENE	2.0E+00	Based on MCL; additivity does not apply
VINYL CHLORIDE	2.2E-01	Based on MCL; additivity does not apply

MO-1 GROUNDWATER RECAP ASSESSMENT:

COC	Limiting MO-1 RS	Compliance Concentration	CC Exceeds MO-1 LRS?	Risk Ratio
2,4/2,6-TOLUENEDIAMINE	1.0E-02	2.8E+01	Yes	2800
O AND/OR P -TOLUIDINE	1.0E-02	4.1E-01	Yes	41
TRICHLOROETHANE,1,1,2-	3.7E-02	3.6E-02	No	--
DICHLOROETHANE,1,1-	6.0E+00	5.7E+00	No	--
DICHLOROETHENE,1,1-	5.2E-02	1.8E-01	Yes	3
DICHLOROETHANE,1,2-	3.7E-02	2.1E+00	Yes	56
BENZENE	3.7E-02	6.2E-02	Yes	2
CHLOROETHANE (ETHYLCHLORIDE)	2.8E-02	1.2E-02	No	--
TOLUENE	7.4E+00	2.0E+00	No	--
VINYL CHLORIDE	1.5E-02	2.2E-01	Yes	15

Attachment 8
Response from the Potentially Responsible Parties
Dated December 13, 2010

First Five-Year Review Report
Applicable ROD Cleanup Levels Addendum
Combustion, Inc. Site
Livingston Parish, Louisiana

Introduction

The purpose of this document is to provide additional information on the applicability of Maximum Contaminant Levels (MCLs) as Applicable or Relevant and Appropriate Requirements (ARARs) for the Combustion, Inc. site groundwater.

General Comments

The PRPs agree that MCLs are ARARs at the point of exposure (POE) for the Combustion, Inc. site groundwater. The Louisiana Risk Evaluation/Corrective Action Program (RECAP) is also an equally applicable standard to be considered in assessment of the remedy performance at the site. These two standards are not in conflict but are in concert with one another; RECAP mandates compliance with MCLs at the appropriate Point of Exposure for the site.

The water-bearing zone at the Combustion, Inc. site is a Groundwater Classification 2B (GW2B), a domestic water supply, not a public water supply. GW2B zones have yields of 800 to 4,800 gallons/day and TDS content of <1,000 mg/L. The zone at the Combustion, Inc. site is not considered to be a public water supply because it produces an insufficient yield (<4,800 gallons/day). In addition, the wide spread use of residential sewage treatment systems that discharge to ditches or leach to groundwater make it undesirable to use as a domestic or public water supply (see write-up in EA FYR report). For GW2, RECAP establishes that the Point of Exposure to meet both standards (RECAP and MCLs) is the property line or the nearest potential water well. In the site's current status and restricted use, the property boundary is the Point of Exposure for the site.

RECAP defines the POE for a GW2 groundwater as follows:

> ***2.11.2 Groundwater Classification 2***
> *In the absence of an on-site exposure point, the POE for an underground drinking water source meeting the criteria for Groundwater Classification 2 shall be assumed to be at the facility's property boundary (nearest to the source and/or downgradient of the source) or the nearest downgradient point off-site that could reasonably be considered for installation of a drinking water well within the aquifer to be protected/restored.*

LDEQ is the lead agency for the Combustion, Inc. site; therefore, Louisiana RECAP methods were utilized to calculate Cleanup Levels for the site groundwater prior to

promulgation of the ROD. RECAP is a program of tiered standards that become progressively more site-specific moving from general screening standards (Screening Option evaluations) to detailed site-specific risk assessments (Management Options 1-3). All RECAP tiers require that MCLs, when available, be applied at the defined Point of Exposure as the RECAP groundwater exposure pathway standard for GW1 and GW2 groundwater zones. The Cleanup Levels in the ROD were calculated using RECAP Management Option-1 (MO-1) methods (see Table 1) and are based on MCLs, when available.

Calculation of the site-specific limiting MO-1 RECAP standards under the 2003 RECAP presented in the PRP Recommendations and Follow-up Actions Document includes evaluation of the following pathways:

- Default exposure pathway based on groundwater use/classification (GW1, GW2, $GW3_{DW}$, or $GW3_{NDW}$). In the case of Combustion, Inc., GW2 standards are calculated.
- Volatile emissions of COCs from groundwater to ambient air (GWair)
- Vapor intrusion to indoor air in an enclosed space (GWes)
- Solubility of the COC in water ($Water_{sol}$)

The limiting MO-1 RECAP standard is the lowest of the values calculated for the evaluated pathways (GW2, GWair, GWes, and $Water_{sol}$).

Table 1 presents the ROD site-specific Cleanup Levels based on the RECAP program from 2000 and the groundwater data from 2000 Q4. Two site-specific factors are applied to the GW2 default pathway to calculate a site-specific GW2 RECAP standard:

- ***DF2***: As shown in Table 1 above the tabulated Cleanup Levels, procedures for determining the RECAP MO-1 dilution factor for Class 2 groundwater (DF2) from Page I-29 of 2000 RECAP are detailed. This is the first of two site-specific modification factors applied to the GW2 default pathway to develop a site-specific GW2 RECAP standard. The DF2 applied when the existing ROD MO-1 Cleanup Level calculations were first performed was 7.4. The same DF2 was utilized when the updated MO-1 RECAP standards using the 2010 Q4 site groundwater data were developed.

- ***Target Organ Modification Factor***: In Table 1, notes below the tabulated Cleanup Levels provide details on the second modification factor applied to the GW2 pathway, the non-carcinogenic target organ modification factor.

RECAP was updated between 2000 and 2010 such that the GWair and GWes pathways have been included in the updated MO-1 evaluation as discussed in the PRP's comment submittal of December 8, 2010.

For two constituents [TDA and toluidine], the GW2 pathway calculations developed a MO-1 RECAP standard that was less than the quantitation limit for the COC so the

quantitation limit was assigned as the ROD Cleanup level. MCLs have not been established for TDA and toluidine.

A comparison of the existing ROD Cleanup Standards using RECAP 2000 with current site groundwater data at the time (2000 Q4) to updated MO-1 RECAP standards using the 2010 Q4 site groundwater data is presented in Table 2. There are fewer COCs for the 2010 Q4 data evaluation because the installed remedy has significantly reduced the mass of COCs in the groundwater and, consequently, the presence and concentration of several site COCs.

It is also worth noting that the groundwater at the site is not of acceptable quality to use for drinking water. The following text is an excerpt from EA Consultants' draft Five-Year Review Report:

> *Based on results of a door-to-door survey conducted during the Phase II RI (Woodward-Clyde Consultants [WCC] 1997), the groundwater in the site vicinity is not used for drinking water, and nearby residences are on public water supply.*
>
> *The residential area surrounding the Process Area is not supplied with public sewage treatment facilities. Each home in the area has its own septic system or equivalent sewage treatment/handling equipment. Several of these contain a polyvinyl chloride (PVC) pipe to discharge excess system flows to a ditch located at the front or rear of the property. These discharge pipes are visible along the road ditches. As a result of this practice, domestic septage from several of these residences is discharging to the Drainage Canal via drainage ditches along the rear lot lines of the residential roads. Fecal coliform was detected in the Drainage Canal and in monitoring well BW-3S (located north of the Process Area in the former parking lot). Because of the presence of domestic sewage in the shallow groundwater and the availability of publicly supplied water, use of the shallow groundwater as a domestic water supply is unlikely and undesirable.*

Risk-based corrective action as prescribed by RECAP is a recognized program for site evaluation and cleanup of contaminated sites under both the RCRA and CERCLA programs in Louisiana. The Point of Exposure under RECAP is subject to review and modification as ownership and use of the property changes in the future. It is possible, in the future, if ownership or use of the site should change (not expected) then a revised RECAP standard may become applicable.

As you are aware, as part of the ROD and pursuant to RECAP, the PRPs filed a conveyance notice for the property documenting the ROD required groundwater Cleanup Levels.

TABLES

Table 1

ROD Cleanup Levels[1]

Process Area Groundwater

Calculation Notes:

425 = Distance from Point of Compliance (POC) at designated sentinel monitor wells MW-206S and MW-207S to downgradient Property Boundary (POE) (ft)

18 = Thickness of impacted groundwater, Sd (ft)

7.4 = GW2 Longitudinal Dilution Factor (DF2) from Page I-29 of RECAP (LDEQ , 2000) (dimensionless)

Constituents Detected in Process Area Groundwater (Class 2B) During 3rd and 4th Quarter 2000 Events at Concentrations Above the RECAP Screening Level	CAS	Target Organ	Modification Factor to Account for Additivity Effects on Target Organs[4]	GW2 from Table 3 of RECAP (LDEQ, 2000) (mg/L)	GW2* DF2 * Modification Factor (mg/L)	Solubility (mg/L)	GW1 from Table 3 of RECAP (LDEQ, 2000) (mg/L)	GW1* Modification Factor (mg/L)	Cleanup Level (mg/L)
2,4/2,6-TOLUENEDIAMINE[3]	95-80-7	Carcinogenic (based on epidemiological studies, aromatic amines cause urinary bladder cancer)	1	0.01 [4]	Not applicable[4]	33,650	0.01	0.01	0.01
O AND/OR P -TOLUIDINE[3]	95-53-4	Carcinogenic (based on epidemiological studies, aromatic amines cause urinary bladder cancer)	1	0.00028	0.002	16,600	0.01	0.01	0.01
1,1,2-TRICHLOROETHANE	79-00-5	Liver effects	0.125	0.005	0.005	4,420	0.005	0.000625	0.005
1,1-DICHLOROETHANE	75-34-3	Liver; Kidney; Respiratory System; Central Nervous System; Skin	0.125	0.81	0.749	5,060	0.81	0.10125	0.749
1,1-DICHLOROETHENE	75-35-4	Liver effects	0.125	0.007	0.006	2,250	0.007	0.000875	0.006
1,2-DICHLOROETHANE	107-06-2	Carcinogen	1	0.005	0.037	8,520	0.005	0.005	0.005
ACETONE	67-64-1	Liver effects (increased weight); Kidney toxicity	0.125	0.61	0.564	1,000,000	0.61	0.07625	0.564
BENZENE	71-43-2	Carcinogenic	1	0.005	0.037	1,750	0.005	0.005	0.005
CHLOROETHANE	75-00-3	Fetal toxicity (delayed ossification)	1	0.0038	0.028	5,700	0.01	0.01	0.028
CIS-1,2-DICHLOROETHENE	156-59-2	Hematological effects (decreased hemoglobin and hematocrit)	1	0.07	0.518	3,500	0.07	0.07	0.518
METHYLENE CHLORIDE	75-09-2	Liver effects	0.125	0.0042	0.004	13,000	0.005	0.000625	0.004
TETRACHLOROETHENE	127-18-4	Liver effects	0.125	0.005	0.005	200	0.005	0.000625	0.005
TOLUENE	108-88-3	Liver effects (change in weight); Kidney effects (change in weight); Central nervous system effects; Nasal cavity (degeneration of epithelium)	0.125	1	0.925	526	1	0.125	1
VINYL CHLORIDE	75-01-4	Liver effects	0.125	0.002	0.002	2,760	0.002	0.00025	0.002

NOTES:

[1] These Cleanup Goals were calculated using the Management Option 1 (MO-1) under RECAP. The MO-2 and/or MO-3 tiers may also be used to evaluate residual constituents in the shallow groundwater.

[2] The modification factors to account for additivity have been applied equally between constituents. Alternative sets of cleanup goals can be developed by distributing the additivity modification factors differently. Also note that as the groundwater quality continues to improve, less liver-associated constituents will be carried forward from the Screening Option to the MO-1 option. As the number of liver-associated constituents evaluated in the MO-1 option decrease, the equally weighted additivity factors will increase.

[3] The LDEQ spreadsheet for calculating MO-1 RECAP standards was utilized to determine the GW2 and GW1 values for this constituent. The chemical properties and toxicity values were obtained from the Risk Assessment Information System (RAIS) database.

[4] GW2 multiplied by maximum DF is less than GW1 thus default to GW1.

Table 2
Comparison of Existing ROD Cleanup Levels to Updated MO-1 RECAP Standard
Process Area Groundwater

Calculation Notes:
425 = Distance from Point of Compliance (POC) at designated sentinel monitor wells MW-206S and MW-207S to downgradient Property Boundary (POE) (ft)
18 = Thickness of impacted groundwater, Sd (ft)
7.4 = GW2 Longitudinal Dilution Factor (DF2) from Page I-29 of RECAP (LDEQ , 2000) and from Page H-40 of RECAP (LDEQ, 2003) (dimensionless) based on POC to POE in the range of 251-500 feet and a saturated thickness of 16-20 feet

GROUNDWATER - Identification of the Limiting MO-1 RS for 2000 Q4 data.

			Column A	Column B	Column C	Column D =Colums A*B*C	Column E	Column F	Column G	Column H =Minimum (Colums D, E, F, G)
2000 Q4 COC	**CAS**	**Target Organ**	**GW2**	**DF2**	**Target Organ Additivity Factor**	**Final GW2**	**GW_{es}**	**GW_{air}**	**Solubility (mg/L)**	**Limiting MO-1 RS (mg/L)**
2,4/2,6-TOLUENEDIAMINE	95-80-7	Carcinogenic (based on epidemiological studies, aromatic amines cause urinary bladder cancer)	0.01	7.4	1	Not applicable	Exposure pathway not evaluated as part of the 2000 RECAP Evaluation	Exposure pathway not evaluated as part of the 2000 RECAP Evaluation	33,650	0.01 (Quantitation Limit)
O AND/OR P -TOLUIDINE	95-53-4	Carcinogenic (based on epidemiological studies, aromatic amines cause urinary bladder cancer)	0.00028	7.4	1	Not applicable			16,600	0.01 (Quantitation Limit)
1,1,2-TRICHLOROETHANE	79-00-5	Liver effects	0.005	7.4	0.125	0.005			4,420	0.005
1,1-DICHLOROETHANE	75-34-3	Liver; Kidney; Respiratory System; Central Nervous System; Skin	0.81	7.4	0.125	0.749			5,060	0.749
1,1-DICHLOROETHENE	75-35-4	Liver effects	0.007	7.4	0.125	0.006			2,250	0.006
1,2-DICHLOROETHANE	107-06-2	Carcinogen	0.005	7.4	1	0.037			8,520	0.005
ACETONE	67-64-1	Liver effects (increased weight); Kidney toxicity	0.61	7.4	0.125	0.564			1,000,000	0.564
BENZENE	71-43-2	Carcinogenic	0.005	7.4	1	0.037			1,750	0.005
CHLOROETHANE	75-00-3	Fetal toxicity (delayed ossification)	0.0038	7.4	1	0.028			5,700	0.028
CIS-1,2-DICHLOROETHENE	156-59-2	Hematological effects (decreased hemoglobin and hematocrit)	0.07	7.4	1	0.518			3,500	0.518
METHYLENE CHLORIDE	75-09-2	Liver effects	0.0042	7.4	0.125	0.004			13,000	0.004
TETRACHLOROETHENE	127-18-4	Liver effects	0.005	7.4	0.125	0.005			200	0.005
TOLUENE	108-88-3	Liver effects (change in weight); Kidney effects (change in weight); Central nervous system effects; Nasal cavity (degeneration of epithelium)	1	7.4	0.125	0.925			526	1
VINYL CHLORIDE	75-01-4	Liver effects	0.002	7.4	0.125	0.002			2,760	0.002

Note: EPA assigned MCLs for these COCs. The PRPs recived a phone call from LDEQ stating EPA's change for EDC.

GROUNDWATER - Identification of the Limiting MO-1 RS for 2010 Q4 data.

2010 Q4 COC	**CAS**	**Target Organ**	**GW2**	**DF2**	**Target Organ Additivity Factor**	**Final GW2**	**GW_{es}**	**GW_{air}**	**$Water_{sol}$**	**Limiting MO-1 RS**
2,4/2,6-TOLUENEDIAMINE	95-80-7	Carcinogenic	0.01 (Quantitation Limit)	NA	NA	0.01 (Quantitation Limit)	NA for SVOCs	NA for SVOCs	3.4E+04	0.01 (Quantitation Limit)
O AND/OR P -TOLUIDINE	95-53-4	Carcinogenic	0.01 (Quantitation Limit)	NA	NA	0.01 (Quantitation Limit)	NA for SVOCs	NA for SVOCs	1.7E+04	0.01 (Quantitation Limit)
TRICHLOROETHANE,1,1,2-	79-00-5	Based on MCL; additivity does not apply per RECAP	5.0E-03	7.4	NA	3.7E-02	8.4E+00	6.2E+02	4.4E+03	3.7E-02
DICHLOROETHANE,1,1-	75-34-3	Liver; Kidney; Respiratory System; Central Nervous System; Skin	8.1E-01	7.4	1	6.0E+00	1.4E+02	1.7E+04	5.1E+03	6.0E+00
DICHLOROETHENE,1,1-	75-35-4	Based on MCL; additivity does not apply per RECAP	7.0E-03	7.4	NA	5.2E-02	1.8E+01	4.0E+03	2.3E+03	5.2E-02
DICHLOROETHANE,1,2-	107-06-2	Based on MCL; additivity does not apply per RECAP	5.0E-03	7.4	NA	3.7E-02	3.6E+00	2.8E+02	8.5E+03	3.7E-02
BENZENE	71-43-2	Based on MCL; additivity does not apply per RECAP	5.0E-03	7.4	NA	3.7E-02	2.9E+00	3.9E+02	1.8E+03	3.7E-02
CHLOROETHANE (ETHYLCHLORIDE)	75-00-3	Fetal Toxicity	3.8E-03	7.4	1	2.8E-02	5.1E+03	1.1E+06	5.7E+03	2.8E-02
TOLUENE	108-88-3	Based on MCL; additivity does not apply per RECAP	1.0E+00	7.4	NA	7.4E+00	8.9E+01	1.3E+04	5.3E+02	7.4E+00
VINYL CHLORIDE	75-01-4	Based on MCL; additivity does not apply per RECAP	2.0E-03	7.4	NA	1.5E-02	2.0E-01	6.0E+01	2.8E+03	1.5E-02