

The Louisiana Department of Environmental Quality

FINAL DECISION DOCUMENT

For the

FINAL REMEDY of

Thompson Hayward Site (a.k.a. THAN Harcros)

Agency Interest # 1275

1.0 INTRODUCTION

In 1997, the Louisiana Department of Environmental Quality (LDEQ) and the Louisiana Department of Agriculture and Forestry (LDAF) entered into a Cooperative Agreement with T.H. Agriculture and Nutrition L.L.C. (THAN) and Elementis Chemical Inc. (Formerly Harcros Chemical) to address the Thompson Hayward (also known as THAN Harcros) site. The mutual objectives of the parties, in entering into this agreement, were to conduct an environmental investigation of the site, perform a risk assessment to determine remedial action levels that are protective of human health and the environment, conduct a feasibility study of available remediation technologies and select and implement an appropriate remedy capable of meeting accepted remedial action objectives.

In accordance with LAC 33:VI.511, this Decision Document announces LDEQ's proposed decision concerning the final remedy of the Thompson Hayward site. It will give a brief description of this site's history and background, outline the past investigation activities, including the risk assessment and feasibility study results, list all evaluated remedies, and give a brief description of the selected remedy for the site.

2.0 SITE BACKGROUND

2.1 Location

The site consists of an approximately 2.7-acre property located at 7700 Earhart Boulevard, New Orleans, Louisiana in Orleans Parish. It also includes contaminated soils/sediments, debris and other media associated with public right-of-ways and the servitudes of all bounding streets contiguous with or adjacent to the property.

The property is located in a mixed residential and commercial area of the Gert Town district of the City of New Orleans. It is bounded by Earhart Boulevard to the North, Colapissa Street to the South, Pine Street to the East, and Burdette Street to the West.

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The geographical coordinates are approximately 29° 57' 32" North Latitude and 90° 06' 42" West Longitude. The site contains a large warehouse building and land surface that is all overlain with a temporary asphalt cover. It is currently unused and mostly surrounded with a chain-link fence.

2.2 Operational and Ownership History

The property is currently owned by Elementis Chemical Incorporated. Elementis acquired the property from THAN in 1981, and THAN, itself, bought the property from Gaylord Container Company in 1941. According to site records, pesticide-related operation was initiated at the site during the 1940's with small-scale dry formulation of pesticide products. Liquid formulation was added during the 1950's. The pesticide formulation operations continued through the 1960's until 1977 when all forms of pesticide formulation ended. From 1977 to 1988, industrial activities on the site consisted of the bagging of soda ash material and the warehousing and distribution of several industrial chemicals. These chemicals included dry cleaning fluids and commercial pest control products. All industrial/commercial activities ended on the site in 1988. Since then the property has remained unoccupied.

2.3 Past Environmental Activities

Environmental awareness of the site began in 1987 with the discovery of dry-cleaning related chemicals in the New Orleans Sewerage and Water Board (NOS&WB) drainage system. These chemicals were discovered to have emanated from the Thompson Hayward site. In March of 1988, the LDEQ issued a compliance order to the owners and operators of the site to address the discharge of tetrachloroethane, trichloroethene, 1,1,1-trichloroethane, and 1,2-dichloroethene into the city's storm sewer system. A related environmental site assessment of the facility was also conducted in 1988 and it indicated impacts to soil by past pesticide formulation activities as well as dry cleaning chemical storage activities. The facility's dealings with LDEQ culminated in the issuance of a joint LDEQ and LDAF compliance order on May 8, 1989 to THAN and Elementis to implement a Remedial Action Plan (RAP) and a Groundwater Quality Assessment Plan (GQAP). The facility implemented this action in 1989 and 1990. The resulting interim remedial action included:

- Removal and plugging of on-site storm drains and the plugging of sewer lines that leave the property,
- Demolition and off-site disposal of the mixing plant building located in the northwestern section of the site,
- Demolition and off-site disposal of all aboveground tanks,
- Excavation of most of the soil areas and off-site disposal of generated debris and soil media,
- Backfilling of excavated area with clean fill, and
- Placement of an asphalt cover over the property, including the backfilled areas.

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Not all on-site soil was excavated during the interim remedial activity. The soils located under the former pesticide and herbicide formulation areas were left untouched because of waste classification and related Resource Conservation and Recovery Act (RCRA) Land Ban Restriction (LDR) issues for wastes classified as hazardous waste. Prior to this 1989-1990 interim remedial action, the responsible parties made a determination based on analytical data to classify the wastes in these two areas as RCRA F027 listed hazardous waste contaminated media. Specifically, this classification was made after detecting pentachlorophenol in the pesticide area and 2,4,5-trichlorophenoxy-propionic acid (2,4,5-TP) in the herbicide formulation area. The waste classification of F027 limited available remediation options since there were no disposal facilities in the United States capable of handling this type of hazardous waste. As a result, a decision was made to contain the waste by placement of the above-mentioned asphalt cover pending development of an appropriate remedial technology or an acceptable disposal plan.

In 1997, the LDEQ and LDAF entered into a cooperative agreement with the responsible parties (i.e., THAN and Elementis) to conclude the remediation of the property. This agreement, which superseded the joint compliance order issued on May 8, 1989, also required the performance of street sampling activities to evaluate the nature and extent of contamination in soil adjacent to the property and below the asphalt/paved road surfaces of the surrounding city streets. As part of the sampling activities, soil samples were collected from about 75 locations under Earhart, Collapissa, Burdette, and Pine Streets; sediment samples were collected and analyzed from 15 storm drain manholes from the same streets; two soil samples were collected for analysis of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD); and soil gas samples were collected from these streets to evaluate the potential for volatilization during soil disturbance activities that may arise as a result of potential future excavation. The data from this sampling event were combined with those from past sampling activities to determine the nature and extent of the remaining contamination on the property and surrounding areas. A risk assessment conducted afterwards was used to determine the contaminants of concern (COCs) present at this site, the level of risk posed to individuals by the COCs present at both the facility and streets with respect to their present and future uses, and the remedial action levels (RAL) to be used as the basis for the site's remedial action objectives.

The Environmental Protection Agency (EPA) became involved with this site after the completion of the 1989 remediation activity. They conducted a site-related Preliminary Assessment (PA), a Site Inspection (SI), an Expanded Site Inspection (ESI), and in 1995 conducted an additional off-site sampling investigation. These site assessment activities involved the sampling and analyses of environmental samples collected from both within the facility and from surrounding residential properties, and culminated with the release of a risk assessment report in 1996. Following these studies, the EPA concluded that risks posed by the concentration of contaminants detected off-site were within acceptable target risk ranges and referred the facility back to the State of Louisiana. Since then, the LDEQ and the LDAF have been working with the potential responsible parties to conclude the remediation process.

3.0 RISK ASSESSMENT/EVALUATION

As required by the cooperative agreement, a human health risk assessment was to be performed at the conclusion of the street sampling activities. This risk assessment was conducted and it was approved and accepted by the LDEQ in 2002. The assessment used both existing and new data to generate a very protective estimate of the potential risks and/or hazards that could be posed to different types of individuals by the contaminants present at the site and surrounding streets. The assessment, which evaluated the individuals based on the property's current and future land uses, was designed to meet the following requirements:

- Identification of contaminants of concern using all available sampling data,
- Documentation of current and future land uses,
- Documentation of nature and extent of site-related contaminants in all media,
- Identification of exposure pathways and potential receptors,
- Performance of toxicity assessment and risk evaluations, and
- Generation of Remedial Action Levels (RALs) for media needing remediation.

The results of the street sampling and other past sampling activities showed the site to be potentially contaminated with certain metals and organochlorinated (OCL) pesticides and herbicides. Utilizing these sampling data, the site media presenting potentials to pose unacceptable risks to human health and the environment were identified. These include the on-site surface soils (0 - 4.5' below ground surface (bgs)), on-site subsurface soils (0 - 10' bgs), storm drain sediments, and source-area wastes located in the former pesticide and herbicide formulation areas. Exposure assessment identified the following groups and scenarios by which they can contact site-related contaminants in the soil and sediment:

- Storm drain maintenance workers – current land use,
- On-site facility workers – future land use,
- On-site construction workers – future land use, and
- Construction workers in the surrounding streets – future land use.

These individual were then assessed using three identified exposure pathways, namely:

- Inhalation of volatile compounds in the storm drain sediments or airborne soil, particulate matter and dust,
- Incidental ingestion of sediment or soil, and
- Direct dermal contact with sediment or soil.

Based on the results of these studies preliminary Remedial Action Levels (RALs) were calculated. These RALs are then used to determine site-related media needing remediation, as well as cleanup levels for each contaminant of concern. The RALs, which are presented in Table 3-2 of the Feasibility Study report, became the Final Remedial Action Levels for the Thompson Hayward site upon LDEQ's approval of the Human Health Risk Assessment in 2002.

4.0 CONTAMINATED MEDIA

Based on the result of the site-specific risk assessment, the following media were identified as requiring remediation:

- Debris, including facility source areas and cover material
- On-site soil,
- Storm drain sediments, and
- Liquids.

Specifically, the on-site media identified as debris consists of the concrete collection sumps and underground tanks located under the former pesticide formulation area, subsurface concrete drain lines in both the pesticide and herbicide areas, and the original concrete and overlying asphalt covers on these two areas. On-site soils identified as needing remediation consist of soil areas located under both the pesticide and the herbicide areas. These on-site soils were not included in the earlier remediation activities because the contaminated media were, at that time, classified as containing F027 RCRA wastes. Another area identified as needing remediation is a thin strip of soil in the area located just outside the current facility's fence along the southern half of Burdette Street.

The identified storm drain sediment media consist of sediments inside of the drain lines located along the eastern sections of Burdette Street from Earhart Boulevard to Fig Street and on Lowline Street from Earhart Boulevard to Forshey Street. All the media mentioned above are shown in Figure 4.2 of the Feasibility Study report. The soils located under the surrounding streets were not identified as media needing remediation because the results of the street sampling and risk assessment activities showed these media to pose a cumulative risk of only 1×10^{-7} . This is one hundred (100) times below the approved remedial action level for site. Finally, the liquid media requiring remediation include those liquids contained in the underground storage tanks, the concrete sumps, the subsurface concrete drain lines in both the pesticide and herbicide areas, and the liquids that will be generated from flushing the street storm drain lines.

5.0 FEASIBILITY STUDY

As required by the cooperative agreement, a Feasibility Study (FS) of the site was conducted after the completion of the human health risk assessment. The FS was conducted to identify, evaluate, and recommend a remediation alternative capable of meeting the site's remedial action objectives. These objectives are as follows:

1. To reduce or eliminate the potential for direct skin contact with, or ingestion of the site-related contaminants in soil and sediments that are above Remedial Action Levels (RAL) as calculated based on future use scenario;

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2. To eliminate the exposure scenario to storm drain maintenance workers by removing impacted sediments that exceed RALs, and
3. To minimize the migration of contaminants, to the extent practicable, from specific sources into surrounding soil, groundwater, and the City's storm drains.

As part of the FS, pertinent remedial technology options were identified and screened to eliminate those that cannot be implemented technically and administratively.

Technologies evaluated included institutional controls, chemical treatment, thermal treatment, bioremediation, and off-site waste disposal. Each technology was evaluated for its effectiveness in meeting the remedial objectives for the site, its implementability and relative cost. Subsequent to these evaluations, the acceptable technologies were assembled into remedial alternatives. Each remedial alternative was evaluated using the following criteria:

- o Overall protection of human health and the environment,
- o Long and short term effectiveness of the remedial alternative,
- o Reduction of toxicity, mobility, and volume of contamination,
- o Implementability,
- o Compliance with Applicable or Relevant and Appropriate Requirements (ARARs), and
- o Cost.

At the completion of the evaluation, an appropriate remedial alternative was selected by the responsible parties and forwarded to LDEQ for approval. A total of six alternatives were studied and evaluated for the Thompson Hayward site. These alternatives, together with information on their assembled remedial technologies, costs, their advantages and disadvantages, are presented in the table below.

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No.	Remedial Alternative	Assembled Technologies	Cost	Advantages	Disadvantages
# 1	No Action	None	0.0	No advantages	Site not remediated, and therefore, does not provide any protection for human health and the environment.
#2	Source Removal and Containment	Excavation & Off-Site Disposal of Source Area* Soils, On-Site Solidification of Debris and Underground Facility Structures (UFS)**, Flushing of Drain Lines, On-Site Treatment and Off-Site Disposal of Collected Fluids, Off-Site Disposal of Current concrete & Asphalt Cover, Cap Reconstruction, and Implementation of Land Use Controls(e.g., Institutional controls)	\$0.7 M	Reduces the potential for human health risks by eliminating most exposure pathways. Also minimizes potential contaminant migration.	Will not permanently remove contaminants of concern from the contaminated areas. Excavation has potential of generating dust and odor in the area.
#3	Source Removal and On-Site Enhanced Bioremediation of Soil and Sediments	Off-site Encapsulation and Disposal of Debris, Excavation of Current Cap & Underground Facility Structures (UFS), Excavation of all Soils, Off-site Disposal & Treatment of "Source Area" Soils, On-site Bio-treatment of Remaining Soil Using DARAMEND, Backfill of Excavation with Bio-treated Soil, Flushing of Storm Drain Lines, On-site Treatment and/or Disposal Of Collected Fluids, Cap Reconstruction, and Land Use Controls.	\$1.3 M	Will remove the sources. DARAMEND treatment effective in the field with several organochlorinated pesticides and herbicides. Will reduce toxicity, mobility, and volume of wastes. Provides protection of human health and the environment.	On-site bioremediation estimated to take up to 2 years to complete. Field application results may not parallel those achieved during bench-scale treatability study. Excavation has potential of generating dust and odor in the area.

* Source Areas: Soil area located in the former pesticide and herbicide formulation areas.

** Underground Facility Structures (UFS): Storage tanks, sumps, and subsurface concrete drain lines located under both pesticide and herbicide formulation areas.

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No.	Remedial Alternative	Assembled Technologies	Cost	Advantages	Disadvantages
#4	Source Removal and On-Site Treatment of Soil and Sediment Using Thermal Desorption (SuperSTR3)	Off-site Encapsulation and Disposal of Debris, Excavation of Current Cap & Underground Facility Structures (UFS), Excavation of Soils & Sediments, On-Site Thermal Treatment of Soils and Sediments Using SuperSTR3 or Conventional Thermal Desorption Process, Backfill of Excavation with Treated Soil, Off-Site Disposal of Treatment Residuals, Flushing of Storm Drain Lines, On-site Treatment and/or Disposal Of Collected Fluids, Cap Reconstruction, and Land Use Controls.	\$2.3 M to \$2.9 M	Will remediate soil by removing adsorbed contaminants. Will meet Remedial Action Levels, and thus reduce toxicity, mobility, and volume of waste. Provides protection of human health and the environment.	SuperSTR3 process still in the bench-scale phase. Air emission problems may require permit. Take up to 3 years to complete. Excavation has potential of generating dust and odor in the area.
#5	Excavation and Off-Site Disposal <u>Outside of the United States</u> due to F027 Waste Classification	Off-site Encapsulation and Disposal of Debris, Excavation of Current Cap & Underground Facility Structures (UFS), Excavation of Soils & Sediments, Off-Site Disposal of F027 Soil in Canada, Off-Site Disposal of Non-F027 Soil in the U.S., Flushing of Storm Drain Lines, On-site Treatment and/or Disposal Of Collected Fluids, Cap Reconstruction, and Land Use Controls.	\$2.8 M To \$3.4 M	Provides the highest degree of protection because excavation and off-site incineration or treatment permanently removes waste. Meets Remedial Action Level requirements. Provides shorter clean-up time.	No facility in U.S. permitted to incinerate and dispose of F027 wastes. Potential problems with transportation and handling of waste outside the U.S. Excavation has potential of generating dust and odor in the area.
FSA2	Excavation and Off-Site Disposal <u>in a U.S. facility</u> due to U210, U240, U092 and P089 Waste Classifications	Off-site Encapsulation and Disposal of Debris, Excavation of Current Cap & Underground Facility Structures (UFS), Excavation of Soils & Sediments, Off-Site Disposal of all excavated Soil in a Permitted U.S. facility, Flushing of Storm Drain Lines, On-site Treatment and/or Disposal Of Collected Fluids, Cap Reconstruction, and Land Use Controls.	\$2.3 M	Provides same level of protection as Remedial Alternative #5, with added advantage of impacted soils being treated, incinerated, and/or disposed in a permitted U.S. facility.	Excavation has potential of generating dust and odor in the area.

6.0 SELECTED REMEDIAL ALTERNATIVE

Based on the comparison of the evaluated alternatives, Excavation and Off-Site Disposal in a United States Facility (i.e., Remedial Alternative FSA2) is selected as the preferred alternative for the Thompson Hayward site. Remedial Alternative #3, which is Source Removal and On-Site Bioremediation of Soils and Sediments, is currently being considered as a viable second choice for the site. Remedial Alternative #3 was originally selected as the preferred remedy because it offered the opportunity to meet the remedial action objectives without triggering the Land Ban Restriction (LDR) requirements presented by the potential generation and disposal of RCRA listed hazardous waste media. The classification of the source area soils as F027 Listed Hazardous Waste presented difficult disposal problems owing to the fact that the soils' treatment and disposal are hampered by lack of U.S. facilities permitted to handle such types of contaminated media.

However, T H Agriculture & Nutrition (THAN) revisited the Thompson Hayward site's original waste classification because of information gathered in their communications with the EPA concerning another site with pentachlorophenol-contaminated soil. In one of the letters to THAN, dated March 27, 2003, the EPA indicated that classification of listed hazardous waste should be based on analytical data that is supported by documented evidence of spillage, and not solely on analytical results. This letter is included as an attachment to this document. Since the original F027 classification was based only on analytical data, THAN decided to search their files for evidence of documented spillage of pentachlorophenol and 2,4,5 trichlorophenoxy-propionic acid (2,4,5-TP), the chemicals responsible for the F027 classification. The search involved a comprehensive review of all relevant Thompson Hayward files in their possession. These included their New Orleans branch files, project files, and all available litigation documents (i.e., deposition, trial transcripts, and statements from former employees). Having found no documented evidence of spillage, a determination supported by the Final National Contingency Plan (NCP) preamble (53 FR 51444, December 21, 1988, for proposed NCP preamble discussion, and 55 FR 8758, March 13, 1990, for the final preamble discussion) was made by the responsible parties that the original F027 classification was in error. However, based on the same file review mentioned above, there are sufficient documentations, supported by analytical data, to indicate that listed hazardous waste codes exist for some chemical contaminants in the soil media. These contaminants are:

- Perchloroethylene (waste code U210),
- 2,4 - D (U240),
- Dimethylamine (U092),
- Parathion (P089).

This appropriately conducted waste classification of site media as U210, U240, U092, and P089, but not as F027, affords the remedial option of source removal and off-site treatment/disposal of excavated soil and sediments at a permitted U.S. facility. This

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option, designated as Remedial Alternative FSA2, will be more effective in meeting the remedial action objectives proposed for the property. This is so because it will permanently reduce the mobility, toxicity, and volume of site-related hazardous material by excavation and off-site disposal. It will also eliminate the potential for future exposure posed by remaining constituents, and offers the additional advantage of being implemented in an anticipated shorter duration of six months instead of two years for the bioremediation alternative.

The selected remedial alternative, FSA2, consists of a combination of several remedial technologies for the on-site media identified for remediation. Site debris, which includes concrete sumps, on-site drain lines, underground storage tanks, and asphalt and concrete covers, will be excavated and appropriately disposed of off-site. Impacted soil located in both the former pesticide and herbicide formulation areas, as well as the strip of land located between the facility's property line and the southern half of Burdette Street, will also be excavated and appropriately disposed of off-site. Soils containing the identified listed waste codes will be sent off-site for incineration before eventual land disposal. A mechanism to reduce and control dust and odor generated during these excavation activities will be implemented. The sediments located inside the city's two storm drain lines earmarked for remediation will be extracted and disposed of off-site. These drain lines will, then, be flushed with an estimated two pipe volumes of potable water. The flush water will be collected and stored on-site in tanks, treated and then disposed of appropriately. Non-aqueous phase liquids (NAPL) in one of the concrete sumps will be transferred into 55-gallon drums and sent to an incinerator for disposal. Subsequent to soil excavation, confirmatory sampling will be conducted to ensure that the Remedial Action Levels, as well as other remedial objectives, have been met. Then, the open excavated areas will be backfilled with compacted clean fill and covered with crushed limestone and asphalt. Upon completion of the physical activities on-site, certain Land Use Controls (LUC) will be implemented. The LUCs, which include a variety of physical, administrative, and legal mechanisms, are intended to prevent or limit the potential for future human and environmental exposure. With respect to this property, the land use controls will include the construction and maintenance of fencing around the property and placement of institutional controls, such as Conveyance Notification with the Orleans Parish Clerk-of-Courts, which will limit future site development to industrial or commercial use only. In accordance with LAC 33:VI.511, this remedial alternative protects human health and the environment, meets the Remedial Action Levels calculated from the site-specific risk assessment, and complies with both federal and state Applicable or Relevant and Appropriate Requirements. For an in-depth description of the selected remedial alternative, as well as the other remedial alternatives please see the Feasibility Study report (January 2003), Feasibility Study Addendum 1 (September 2004), and Feasibility Study Addendum No. 2 (December 20, 2004)

7.0 PATH FORWARD & ANTICIPATED TIMELINE

The issuance of this Final Decision Document approves the site's Feasibility Study and concludes this phase of the Cooperative Agreement between the State and the responsible

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parties. In accordance with the cooperative agreement, the responsible parties have ninety days from the date this document is signed to submit a work plan for the Remedial Design. Implementation of the chosen remedial alternative will follow LDEQ's review and approval of the design's work plan.

The anticipated timeline for the remaining remediation process is outlined below:

- o March 2, 2006 - submission of remediation design work plan by T H Agriculture and Elementis Chemical, Inc.,
- o April 31, 2006 - approval of remedial design by the LDEQ,
- o July 31, 2006 - initiation of the implementation of the approved remedial design, and
- o December 2006 - completion of remediation.

The timeline outlined above is strictly in adherence to the requirements of the 1997 Cooperative Agreement. The actual implementation times for the remaining phases may be shortened by faster completions of the components of each phase by all parties. LDEQ's goal is to address the remaining process completely and quickly.

Signed this 2nd day of Dec. 2005.

By: Wilbert F. Jordan, Jr.
Wilbert F. Jordan, Jr., Assistant Secretary
Office of Environmental Assessment