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Agency

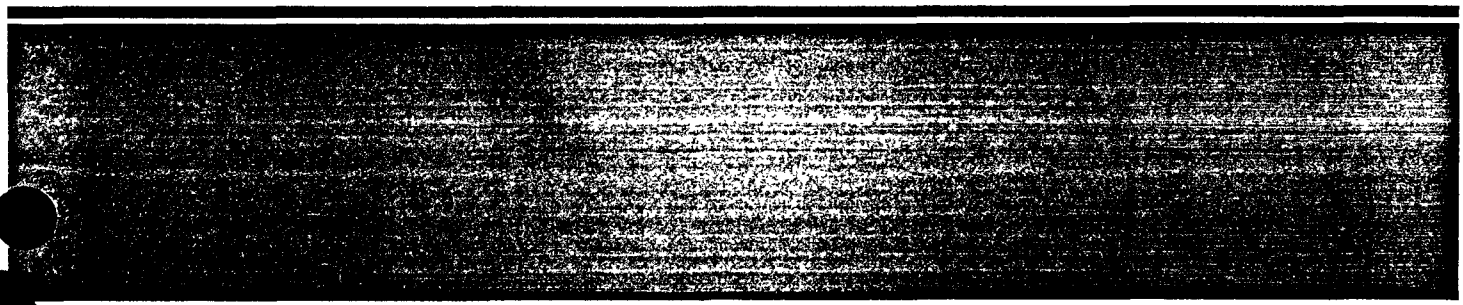
Office of
Emergency and
Remedial Response

EPA/ROD/R06-88/040
September 1988

EPA

Superfund Record of Decision:

Sol Lynn/ Indutrial Transformers, TX



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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Sol Lynn site, also known as Industrial Transformers site, is located in Houston, Texas. The area around the three-quarter-acre site is a mix of residential, commercial, and light industrial facilities. Approximately 2,000 residents and 100,000 other people move within a one-mile radius of the site on a daily basis due to recreational activities associated with the area. The site operated as an electrical transformer salvage and recycling company between 1971 and 1978, and as a chemical recycling and supply company from 1979 through 1980. The first documented investigation of this site took place during the fall of 1971 when the City of Houston Water Pollution Control Division noted that workers at Industrial Transformers poured oil out of electrical transformers onto the ground during transformer dismantling. In 1981, strong odors originating from the site were brought to the attention of the Texas Department of Water Resources, the predecessor agency of the Texas Water Commission (TWC). Upon inspection, approximately 75 drums were found scattered about the property. Most of the drums, labeled "trichloroethylene", were empty and had puncture holes. A technical assessment of the site, commencing in January 1986, indicated the presence of PCB contamination. PCB contamination has been confined to the top two feet of soil. The highest concentrations of PCBs were found in the middle of the site. TCE has migrated deeper
(See Attached Sheet)

17. Document Analysis a. Descriptors

Record of Decision
Sol Lynn/Industrial Transformer, TX
First Remedial Action - Final
Contaminated Media: gw
Key Contaminants: TCE

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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EPA/ROD/R06-88/040
Sol Lynn/Industrial Transformers, TX
Second Remedial Action - Final

16. ABSTRACT (continued)

than the PCBs and away from the site. Residual TCE remaining in the surface soil will be remediated along with the PCB contaminated soils. Any TCE that has migrated into the deeper ground water will be addressed in the second operable unit. The primary contaminants of concern affecting the soil are PCBs.

The selected remedial action for this site includes: excavation of approximately 2,400 yd^3 of PCB-contaminated soil and treatment using alkali metal polyethylene glycolate (APEG) complex dechlorination with onsite disposal of treatment residuals; effectiveness verification of the dechlorination process through treatability studies; and pretreatment of liquid by-products, if necessary, with discharge into a publicly owned treatment works facility. The estimated present worth cost for this remedial action is $2,200,000.

Sol Lynn

RECORD OF DECISON
FOR
INDUSTRIAL TRANSFORMER SITE
PHASE II

Houston
Harris County, Texas
September 1988

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DECLARATION OF
RECORD OF DECISION

SITE NAME AND LOCATION

Industrial Transformers Site
Houston, Texas

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Industrial Transformers site in Houston, Texas, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Contingency Plan (40 CFR Part 300). This decision is based on the administrative record for this site. The attached index identifies the items which comprise the administrative record upon which the selection of the remedial action is based.

DESCRIPTION OF THE REMEDY

This operable unit is the final action of two operable units for the site. This operable unit addresses the groundwater contamination. The remedy addresses the principal threat at the site by treating the contaminated groundwater and reducing the risks associated with exposure to the contaminated water. The first operable unit at this site involves remediation of the contaminated soil.

The major components of the selected groundwater remedy include:

-- Pump and treat, via air stripping, approximately 12 million gallons of groundwater which exceeds the primary drinking water standard for TCE.

-- A carbon unit will be used to filter the exhaust air if it does not meet Texas Air Quality Criteria.

-- The treated groundwater will be disposed in a sanitary sewer or pumped back into the waterbearing zone.

DECLARATION

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable, or relevant and appropriate to the remedial action, and is cost-effective. This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element and utilizes permanent solutions and alternative treatment (or resource

recovery) technologies to the maximum extent practicable. Because this remedy will not result in hazardous substances remaining onsite above health-based levels, the five year facility review will not apply to this action.

The State of Texas has been consulted and supports this remedial decision.

September 23, 1988
Date

Robert E. Layton Jr.
Robert E. Layton Jr., P.E.
Regional Administrator

Summary of Remedial Alternatives Selection for the
Sol Lynn/Industrial Transformer Site,
Operable Unit II, Houston, Texas

I. SITE LOCATION AND DESCRIPTION

The Sol Lynn Superfund site, which is approximately three quarters of an acre in size, (also known as Industrial Transformers (IT)) is located in Houston, Texas. As shown in Figure 1, the site is located just south of I-610 and west of Highway 288. There are two buildings on site which house four retail businesses. The area around the site is a mix of residential, commercial and light industrial facilities. The light industrial and commercial business areas are located directly to the east and south of the site. Astroworld and Astrodome are approximately 3,000 feet to the northwest of the site and a mix of private, single and multi-family dwellings are approximately 4,000 feet to the north. The residential population in the area is about 2,000 and a maximum daily traffic of 100,000 persons may move within a one mile radius due to recreational activities associated with the Astrodome and Astroworld.

Surface drainage around the site include shallow ditches that border the site along Knight and Mansard Streets. These two ditches carry surface runoff by slightly different routes to Braes Bayou, which empties into Buffalo Bayou then into the San Jacinto River. The San Jacinto River ultimately flows into Galveston Bay. The site is above the 100-year flood plain.

SITE HISTORY

The Industrial Transformer site is the location of a former electrical transformer salvage and recycler company which operated between 1971 and 1978. A chemical recycling and supply company subsequently operated at the same location from 1979 through 1980.

The first documented investigation of this site took place during the fall of 1971 when the City of Houston Water Pollution Control Division noted that workers at the Industrial Transformer Company poured oil out of electrical transformers onto the ground as they were being dismantled. In 1981, strong odors originating from the site were brought to the attention of the Texas Department of Water Resources, the predecessor agency of the Texas Water Commission (TWC). Upon inspection it was revealed that approximately 75 drums were scattered about the property. Most of the drums, labeled "trichloroethylene", were empty and had puncture holes.

In October 1984 the site was proposed for inclusion on the National Priorities List. In September 1985, the TWC entered into a Cooperative Agreement with the Environmental Protection Agency (EPA) to conduct the

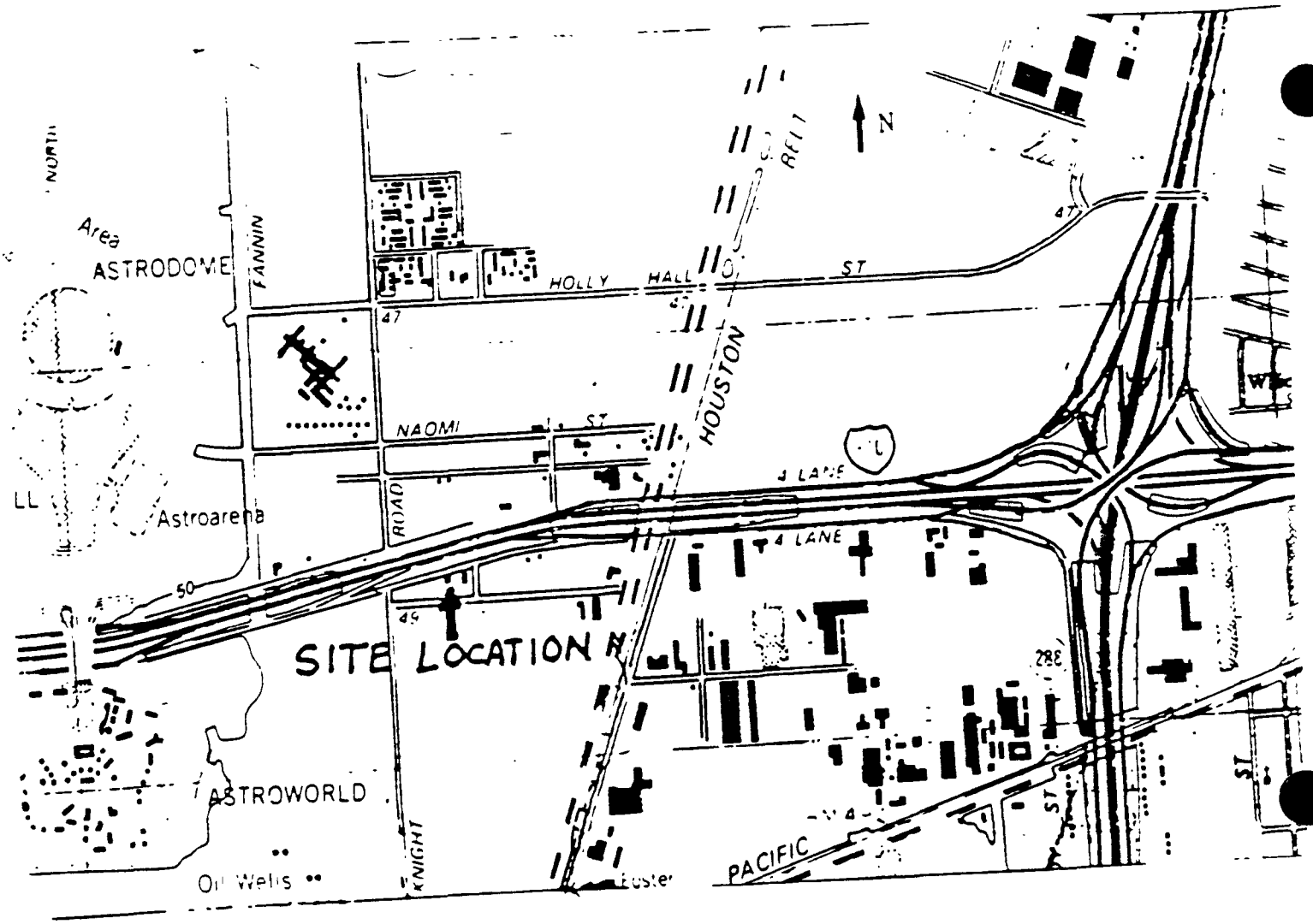


FIGURE 1
INDUSTRIAL TRANSFORMERS SITE

Remedial Investigation/Feasibility Study (RI/FS) at the site. Utilizing funds from this cooperative agreement, the TWC contracted with Radian Corporation on June 30, 1986, for a technical assessment of the site.

In an effort to address the contamination in an expeditious manner, the site was broken down into parts called operable units. The first operable unit addressed soil contamination in the Phase I remedial investigation and feasibility study. The results of this investigation indicated polychlorinated biphenols (PCBs) are isolated in the upper two feet of soil at concentrations to 350 ppm. Trichloroethene (TCE) was also found in the soil in concentrations below the health criterion of 160 ppm. Chemical Dechlorinization was selected as the soil remedy. The remedy selection is documented in the Record of Decision dated March 25, 1988.

This summary only examines potential remedial alternatives for the groundwater operable unit, Phase II.

GEOLOGY

Surface soils at the site and in the vicinity are of the Lake Charles series. These soils are characterized by somewhat poor drainage and high available water capacity. When the soil is dry, deep, wide cracks form on the surface where water can enter rapidly. When the soil is wet the cracks are sealed and water infiltrates slowly.

Below the surface soil is Beaumont Clay, which is of Pleistocene age. The lithology of the Beaumont Clay is comprised of unconsolidated clays and muds or deposits of clayey sands and silts. The clays and muds were deposited as interdistributary, abandoned channel fill, overbank fluvial or mud-filled coastal lake or tidal creek muds. The sands and silts represent alluvium, levee and crevasse splays.

The uppermost aquifer is encountered at a depth of 30-34 feet below ground surface. This particular aquifer is a water-bearing sand that varies in thickness from 2 feet to 6 feet, averaging 4 and 1/2 feet. Sand content increases from west to east across the site, from 50 percent to 70 percent. Water levels taken at monitoring wells in uppermost zone indicate that the groundwater flows to the northwest.

The uppermost water-bearing sand is separated from the next lower, or "second", water-bearing sand by a stiff clay, approximately 45 to 52 feet thick. The second water-bearing sand is underlain by clay. Water levels taken at monitoring wells in the second zone indicate that the groundwater flows to the west.

These aquifers are not used as drinking water supplies. However, these aquifers have the potential to be drinking water sources, Therefore, they are Class IIB aquifers in the EPA groundwater classification system.

The major aquifers in the Houston area are the Chicot and Evangeline. These aquifers supplement surface water in supplying the City with drinking water. In the vicinity of the site the shallowest well for the City of Houston is screened at 670 feet below the surface.

REMEDIAL INVESTIGATION RESULTS

During the Remedial Investigation (RI) groundwater samples were collected using monitoring wells and cone penetrameter to determine the nature and extent of contamination in the groundwater. Soil samples were also collected as the monitoring wells were installed.

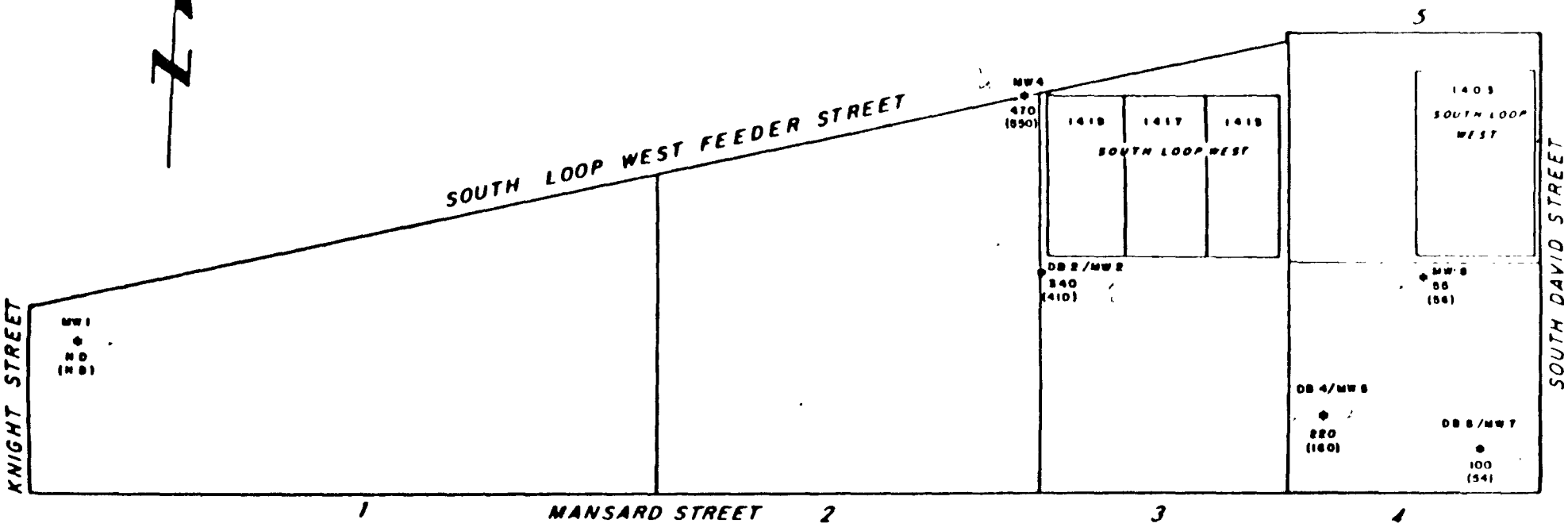
Because information collected previously by TWC indicated the primary contaminants at the site were polychlorinated biphenyls (PCBs) and trichloroethylene (TCE), the emphasis for analytical testing was placed on determining the vertical and areal extent of these contaminants. PCBs were known to adsorb tightly to soils and were not expected to infiltrate into the groundwater. The phase I remedial investigation results verified this, as PCBs were only found in the upper two feet of soil. In addition, the leaching of PCBs into the groundwater would not be expected and accordingly, groundwater sampling did not show any PCB contamination. On the other hand, TCE does not adhere tightly to the soils but will tend to migrate through the soil. TCE is also quite soluble in water. This indicates that the potential for TCE to leach into groundwater is high. Groundwater sampling results indicate that this is the case.

The groundwater was sampled by two different methods. The first method involved withdrawing water samples from installed monitoring wells. Water samples were collected twice from six monitoring wells screened in the uppermost water-bearing zone and analyzed for TCE. The locations of the wells and TCE concentrations for both sampling events are shown on Figure 2.

In the second method, a cone penetrometer was advanced into the uppermost water-bearing sand. A well-screen tip was substituted for the tip of the cone penetrometer and at a selected depth the sampling sleeve was pulled up to expose the screen. Twenty samples were obtained and analyzed for TCE from this method. The cone penetrometer was only used in the uppermost aquifer.

The results from both methods indicate the highest concentration of TCE in the groundwater is directly below the island between the South Loop West feeder street and South Loop West.

Figure 3 shows contour lines of TCE in the uppermost water-bearing zone using both the monitoring well water samples and the cone penetrometer samples. This illustration indicates the plume extends to the north-northwest.



LEGEND

DB 4/MW 6 – DEEP BORING/MONITOR WELL NUMBER
● – WELL LOCATION
220 – SAMPLE VALUE 1st ROUND
N D – NONE DETECTED
(160) – SAMPLE VALUE 2nd ROUND

FIGURE 2

TCE VALUES FOR SHALLOW DEPTH MONITOR WELL WATER SAMPLES (PPM).
(FIRST & SECOND ROUND) PHASE II

0 3 15 23 33 45 100
SCALE IN FEET

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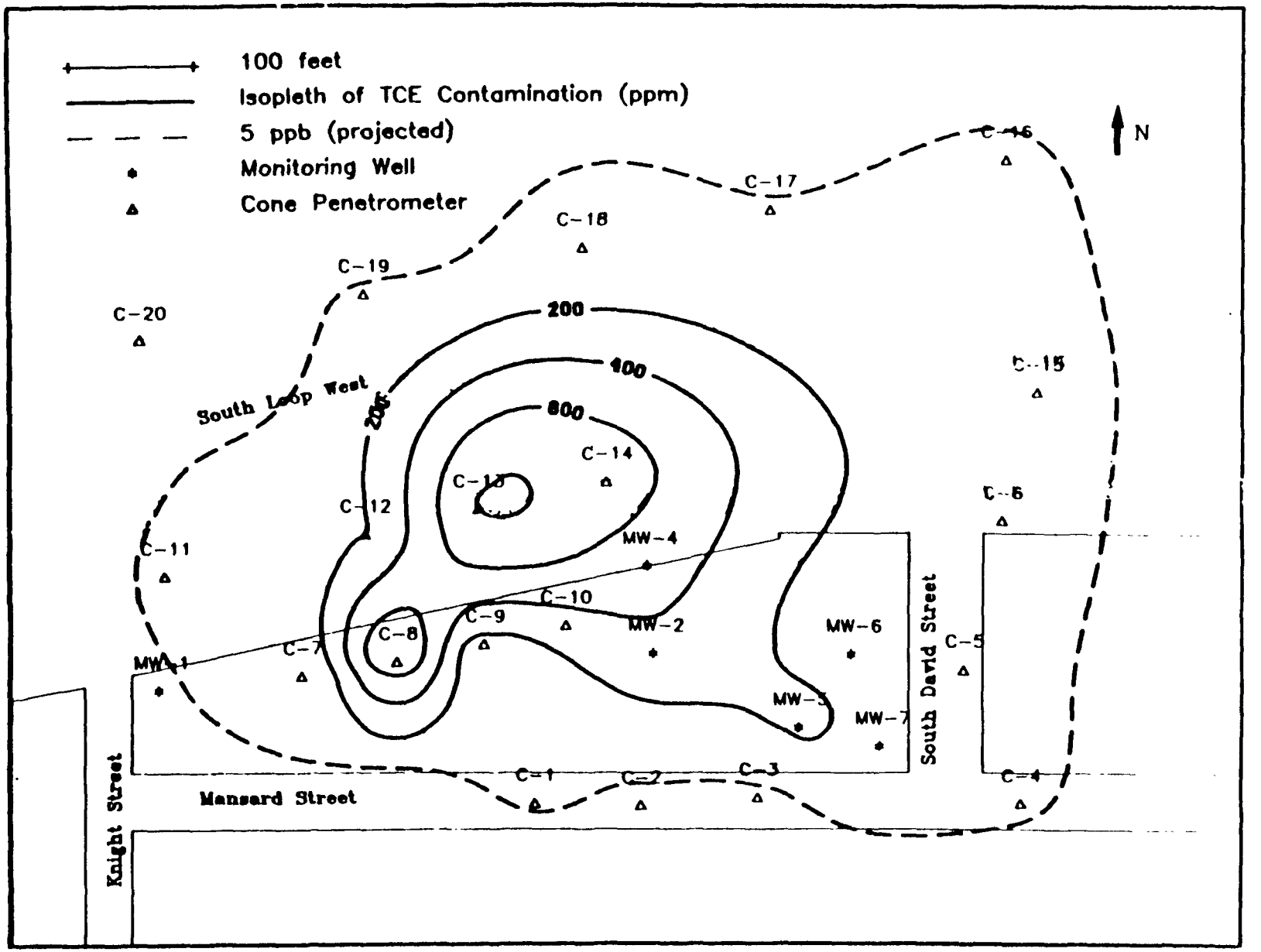

RADIAN CORPORATION

Figure 3
Concentration Plume
in the Uppermost Aquifer

Three monitoring wells which were installed in the second water-bearing zone, were sampled twice. The concentrations of TCE from both sampling events and the location of the wells are illustrated in Figure 4. Although these three wells cannot identify the extent of the plume or the volume of contaminated water in this zone they do indicate: (a) that the TCE has penetrated down to this water-bearing zone; and (b) that the flow gradient of this zone is to the west.

Deep soil samples were taken during the installation of monitoring well #10. These samples were taken at two-foot intervals. The analytical results indicate that TCE contamination was found as deep as 101 feet. The highest concentration of TCE in the soil was 600 ppm obtained in a sample taken at a depth of 18-20 feet. Based on laboratory studies, soil above the water table will contribute TCE to the groundwater by two mechanisms. First, as groundwater is pumped from the upper water-bearing zone, water in the soil above the water table will be drawn into the aquifer. TCE in the soil will be released in the water-bearing zone as the groundwater is pumped. Second, TCE will also reach the water table as rainwater percolates through the soil. Because it is quite soluble and will not tend to adsorb to the soil particles of the aquifer, TCE is expected to be quite mobile once it reaches the groundwater, increasing the size of the plume.

The general water quality was also determined in this investigation. The analytical results revealed that there are up to 3670 mg/l of dissolved solids in the upper aquifer and up to 1650 mg/1 in the second aquifer. Suspended solids are visually noted in both aquifers. While the suspended and dissolved solids are high in both aquifers they are still within the potential drinking water range. The EPA identifies a potential drinking water source as having less than 10,000 mg/l dissolved solids. These aquifers could be classified as Class IIB aquifers. They are not currently used as a resource, but could be used as a future supplemental source of water.

These observations indicate the following:

- o TCE contamination is observed in the soil on site from the surface to a depth of 101 feet;
- o TCE contaminates both the uppermost and the second water-bearing zones. The highest concentrations of TCE (790 ppm; cone penetrometer number 13) in the uppermost aquifer was observed off site underneath the median strip between I-610 South Loop West and the southern feeder street. The volume of contaminated water in the uppermost aquifer is estimated at 3.2 million gallons;
- o Although a volume cannot be defined for the second water-bearing zone because of the westerly gradient; it appears the Phase II investigation has identified the northern boundary of the plume. Further definition of the plume will be required in the remedial design portion of this project.
- o TCE is the only identfied contaminant in the groundwater.

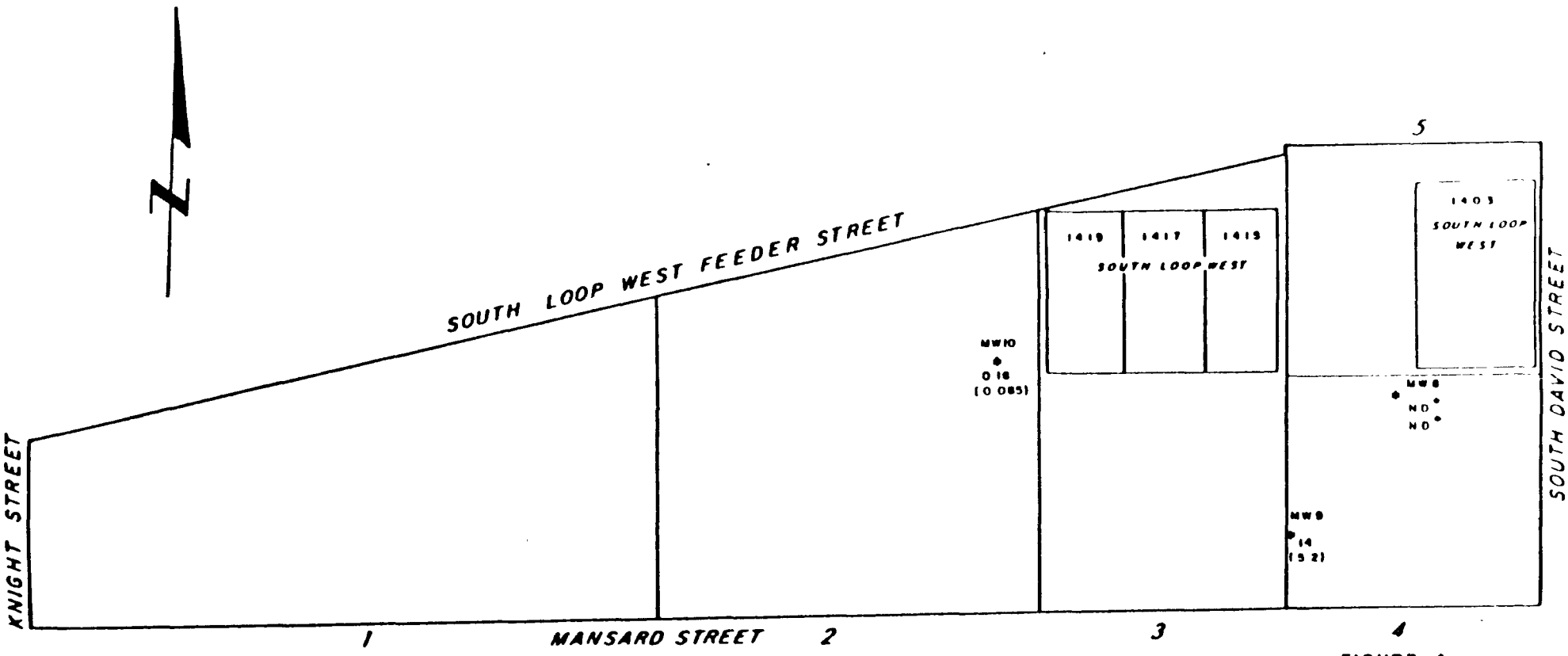

FIGURE 4

TCE VALUES FOR INTERMEDIATE DEPTH (101 Foot) MONITOR WELL WATER SAMPLES (PPM) (FIRST & SECOND ROUNDS) PHASE II

LEGEND

MW10	– MONITOR WELL NUMBER
●	– MONITOR WELL LOCATION
0 160	– SAMPLE VALUE
ND*	– NOT DETECTED; LESS THAN 0 0021 PPM

0 5 15 25 35 45 100

SCALE IN FEET

RADIAN CORPORATION

Potential Impacts of the Site on Human Health and the Environment

As part of the remedial investigation, an assessment of the health threat created by the current site conditions was conducted. Factors included in this risk assessment were the identified target receptors, the maximum concentrations of TCE, and the degree of exposure to the hazards from the site. Target receptors identified in the assessment included anyone who utilizes or comes in contact with the contaminated groundwater.

The results of the risk assessment indicate that the highest concentration of TCE found in the groundwater presents greater than a 10^{-1} (one in ten) lifetime cancer risk. This level represents the threat that would be posed by the site conditions if no remedy were implemented and the groundwater utilized. This assessment assumes a 70 kg person consumes 2 liters of contaminated water each day. The major pathways of exposure are inhalation and ingestion.

Levels of cleanup are based on a comparison of the contaminant concentration found at the site to either 1) existing health based standards or criteria; or 2) concentrations that would represent a 10^{-4} to 10^{-7} lifetime cancer risk. Because a standard exists, it is not necessary to calculate a concentration representing the risk range. The health-based criterion for TCE in contaminated water is .005 mg/l (Safe Drinking Water Act of December 1974 as amended in 1986).

II. ENFORCEMENT

The goal of the EPA is to have those parties responsible for contamination of the site perform the cleanup. There are two identified potentially responsible parties (PRPs) for the IT site. These parties will be given the opportunity to conduct or participate in the remedial action selected for the site. If they refuse, EPA may order the parties to perform the remedial design and if they continue to refuse, proceed against them for cost recovery after EPA has funded and implemented the proposed remedy.

III. COMMUNITY RELATIONS HISTORY

The Industrial Transformer Superfund site was proposed for the National Priorities List (NPL) in October 1984. In February 1985 the U.S. Environmental Protection Agency (EPA) and the Texas Water Commission (TWC) held a public meeting in Houston for residents near the site to discuss site conditions and the Superfund Program/Process. Approximately 15 people attended the meeting. On October 3, 1985, EPA issued a news release announcing that funds to study the site had been awarded to the TWC.

Initiation of studies on the Industrial Transformer site was announced by TWC at a public meeting in Houston on September 24, 1986. Evaluation of the site was divided into two separate studies: 1) surface soil contamination; 2) groundwater contamination. The study addressing surface soil contamination

was completed in December 1987. On January 21, 1988, EPA announced to the public via a news release that a public meeting would be held on February 2, 1988, to discuss the proposed remedy for surface contamination at the site.

An EPA prepared fact sheet which described alternative remedial actions for the soil contamination along with the EPA preferred alternative was sent to the interested and affected public shortly after the public meeting was announced. EPA and TWC conducted the 7:00 p.m. public meeting at the Astro Village Hotel on February 2, 1988. Approximately 35 people attended the public meeting.

On August 8, 1988, a news release announced that a public comment period on the groundwater study would begin on August 10, 1988, and end on September 9, 1988. The news release also announced that a public meeting would be held on August 25, 1988, at the Astro Village Hotel, Houston, Texas.

An EPA prepared fact sheet describing the alternative remedial actions for the groundwater study along with the EPA preferred alternative was sent to the site mailing list shortly after the meeting and comment period was announced. EPA and TWC conducted the 7:00 p.m. public meeting on August 25, 1988. Approximately 15 people attended the meeting. Only two questions were asked and no comments were made during the public meeting.

Further details on community relations are contained in Attachment B.

IV. EVALUATION

A. Evaluation Criteria

1. SARA Requirements - Section 121(a) through (f) of SARA contains three factors which EPA must consider in selecting a remedy.

   a. Protection of Human Health and the Environment

      The alternative must provide adequate protection of human health and the environment.

   b. Cost Effectiveness

      Cost effectiveness includes an evaluation of the following criteria:

      i. Long-term Effectiveness and Permanence

         Alternatives are assessed for the long-term effectiveness and permanence they afford along with the degree of certainty that the remedy will prove successful. Factors considered are:

- magnitude of residual risks in terms of amounts and concentrations of waste remaining following implementation of a remedial action, considering the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents;

- type and degree of long-term management required, including monitoring and operation maintenance;

- long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated wastes and residuals.

ii. Short-term Effectiveness

The short-term effectiveness of alternatives must be assessed considering appropriate factors among the following:

- magnitude of reduction of existing risks;

- short-term risks that might be posed to the community, workers, or the environment during implementation of an alternative including potential threats to human health and the environment associated with evacuation, transportation, and redisposal or containment;

- time until full protection is achieved;

- potential need for replacement remedy;

- potential for exposure of human and the environmental receptors for remaining waste considering the potential threat to human health and the environment associated with excavation, transportation, redisposal or containment.

iii. Implementability

The ease or difficulty of implementing the alternatives are assessed by considering the following types of factors:

- degree of difficulty associated with constructing the technology;

- expected operational reliability of the technology;

- need to coordinate with and obtain necessary approvals and permits (e.g. NPDES, Dredge and Fill Permits for off-site actions) from other offices and agencies;

- availability of necessary equipment and specialists;
- available capacity and location of needed treatment, storage, and disposal services;
- compatibility with existing future land use;
- need to respond to other sites.

iv. Cost

The types of costs that should be assessed include the following:

- capital cost;
- operational and maintenance costs;
- cost of five-year reviews, where required;
- net present value of capital and O&M costs;
- potential future remedial action costs.

c. Compliance with Applicable or Relevant and Appropriate Federal and State Regulations

In determining appropriate remedial actions at Superfund sites, consideration must be given to the requirements of other Federal and State laws. Alternatives should be assessed as to whether they attain legally applicable or relevant and appropriate requirements of other Federal and State public health environmental laws. Requirements under Federal and State laws that specifically address the circumstances at a Superfund site are considered applicable. Relevant and appropriate requirements, while not applicable to a Superfund site, address situations which are sufficiently similar to those existing at the site.

2. SARA Preferences. The EPA is also directed by SARA to give preference to remedial actions which reduce the toxicity, mobility or volume of the waste. Relevant factors are:

- the treatment processes the remedies employ and materials they will treat;
- the amount of hazardous material that will be destroyed or treated;
- the degree of expected reduction in toxicity, mobility, or volume;
- the degree to which the treatment is irreversible;

- the residuals that will remain following treatment, considering the persistence, toxicity, mobility, and propensity for bioaccumulation of such hazardous substances and their constituents.

3. EPA Guidelines. It is EPA policy to consider other factors in selection of a remedy. These include:

   a. Community Reaction

      This assessment should look at:

      - components of the alternatives which the community supports;
      - features of the alternatives about which the community has reservations;
      - elements of the alternatives which the community strongly opposes.

   b. State Acceptance

      Evaluation factors include assessments of:

      - components of the alternatives the State supports;
      - features of the alternatives about which the State has reservations;
      - elements of the alternatives under consideration that the State strongly opposes.

B. Description of Alternatives

In accordance with the NCP, an initial set of remedial approaches were screened to determine whether they might be appropriate for this site. From these possible remedies, five remedial alternatives were chosen for more detailed evaluation and comparison with the remedy selection criteria outlined above. Two discharge alternatives are also identified.

All the action alternatives include pumping the contaminated groundwater to the surface. The recovery system consists of placing a number of wells on and around the site and extracting the groundwater. For cost estimating purposes it was assumed that ten wells would be installed 30 feet deep. These wells would pump a total of 3500 gallons per day. The recovery system will extract the 3.2 million gallons of contaminated groundwater currently estimated at the site. An additional volume of groundwater will be pumped and treated as TCE is released from the soil particles in the water-bearing zones. Water percolating through the

unsaturated zone will also add to the total volume of groundwater to be treated. The total volume may approach 12 million gallons of water from the upper waterbearing zone. This recovery system will require approximately 10 years to remove 12 million gallons of water.

Alternative 1, No Action - No additional remedial actions would be conducted. The selected soil remedy would be conducted without treatment of the contaminated groundwater. However, annual environmental monitoring would be required to assess the horizontal and vertical migration of the TCE. In addition, a review to occur every five years would be budgeted into the total costs. A five year review is necessary on any site if wastes above health-based levels remain at the site. The present worth of this alternative is estimated to be $400,000.

Alternative 2 - Collection and Off site Deep Well Injection - This alternative requires that the contaminated groundwater would be pumped and stored in tanks on site. The water would then be shipped via a vacuum tank truck to a deep well injection facility in compliance with EPA regulations.

The deep well facility would provide injection, isolation and monitoring of the contaminated water. Generally, these facilities will use deep clay and shale formations to confine the waste. In the Gulf Coast region, the injection depths for these wells typically range from 7,000 to 8,000 feet.

The site would be monitored during and after remediation for evaluation of the effectiveness of the alternative.

This alternative is not a treatment alternative and therefore does not destroy the TCE. Deep well injection would provide measures for permanent isolation and containment of the contaminated groundwater. This alternative is estimated to cost $4.8 million.

Alternative 3 - Collection, On site Carbon Adsorption and Discharge - In this alternative the contaminated water would be pumped, as previously described, to a storage tank where the solids would be settled. From this settling tank the water would be piped to a carbon adsorption system.

The most applicable carbon adsorption unit is the downflow fixed dual bed granular activated carbon adsorption system. Water would flow, by gravity, down through the column and the TCE would bind to adsorption sites on the activated carbon. Once the adsorption sites became filled with contaminants, the carbon will need to be replaced or regenerated.

The treated water will be tested. If the TCE levels are below the discharge criterion, the water will be discharged using one of the options discussed below. If the concentrations are above the criterion, the water will run through the secondary carbon bed for polishing.

The spent carbon from the adsorption would be shipped off site for regeneration or disposal. The settled solids in the settling tank will be periodically cleaned out and analyzed for TCE. If the solids do not contain TCE they will be shipped off site. If they do contain TCE they will be air stripped and then shipped off site.

This alternative will require a treatability study to select the carbon and design the system. However, this is a routine study and easily done.

This alternative does not destroy TCE, however, it does reduce the volume of TCE contaminated material and would remove the contaminants from the groundwater, concentrating them on the activated carbon which would be disposed in accordance with appropriate regulations. This alternative is estimated to cost $1.8 million.

Alternative 4 - Collection, On site Air Stripping and Discharge - In this alternative the recovery wells will discharge into settling tanks. The water would then be pumped to an air stripping system.

The countercurrent packed tower configuration has been chosen for its effectiveness and adaptability. Air stripping works by pushing air through the contaminated water forcing the volatile chemical contaminants such as TCE to mix with the air and evaporate.

As with Alternative 3, the treated water will be sampled. If it meets the established criterion it will be discharged, if not it will be run through the system again.

The air emissions will be monitored to ensure that there is no threat to human health and the environment. If the air meets all emission standards it will be released into the atmosphere. If it does not meet the emission standards an activated carbon unit will be added to the air stripper. This will be determined during the design portion of the site remediation.

A treatability study will be required to provide design parameters for the air stripping tower. However, this is a routine study and easily performed.

This alternative does not destroy TCE but will remove it from the water and concentrate it on activated carbon. The TCE may be destroyed during the disposal or regeneration of the carbon. The present worth of this alternative is estimated at $2.2 million.

Alternative 5 - Collection, On site Catalytic Dehydrochlorination and Discharge

As with the previous two alternatives, the water is withdrawn and stored in a settling tank.

The contaminated water will be pumped into a batch dehydrochlorination reactor. This alternative will destroy the TCE through a chemical reaction, removing the chlorine atoms from the TCE molecule. The residuals from this reaction would include off-gas and brine, both of which could require additional treatment or disposal. A carbon adsorption column will be used for the treatment of the gases. The brine will be stored and shipped off-site for disposal via deep well injection.

A treatability study would be performed prior to implementation of this alternative to determine reactor size, flow rate and other design parameters. The estimated present worth of this alternative is $6.3 million.

After the cleanup criteria are met, two discharge options will be considered for Alternatives 3,4, and 5. These are (a) reinjection and (b) discharging into publicly owned treatment works (POTW). Reinjection involves pumping the treated water back into the water bearing zone. This option may increase the recovery rate of the contaminated water. Discharging into a treatment plant would require obtaining permission from the City of Houston Public Works Department and TWC before releasing the treated water into the wastewater system. This option would also require that the standards of the National Pollution Discharge Elimination System (NPDES) be met. Reinjection is estimated to cost $93,650 and discharging into a POTW is estimated to cost $212,860.

Evaluation of Alternatives

An evaluation of the alternatives is shown on Table 1. The following values were assigned to compare remedial selection criteria:

\+ Alternative would exceed a criterion in comparison to other alternatives.

0 Alternative can be designed to meet the selection criterion.

\- In comparison to other remedies, this alternative will present difficulty in achieving a selection criterion.

1. Complies with ARARs - (meets or exceeds Applicable, or Relevant and Appropriate Federal and State Requirements.) Table 2 delineates the Federal and State statutes which are applicable or relevant and appropriate (ARARs). In all instances where the regulation is considered applicable or relevant and appropriate, those requirements will be met. The maximum contaminant level (MCL) for TCE is considered the appropriate cleanup criteria because these are considered Class IIB aquifers.
2. Reduces Toxicity, Mobility and Volume - The "No Action" alternatives was rated "0" in reducing toxicity and mobility because it does nothing to reduce these parameters. The volume will continue to increase as the plume spreads. Therefore, it was rated "-" for volume reduction. Natural flushing will occur; however, due to the low transmissivity it will take generations as compared with a decade using any of the other alternative. Deep well injection was rated "0" for toxicity

TABLE 1
Alternatives Evaluation

ALTERNATIVES	REDUCES			EFFECTIVENESS		IMPLEMENTABILITY	COST
	MOB.	TOX.	VOL.	SHORT-TERM	LONG-TERM		$ MILLION
1. No Action	0	0	-	-	-	+	0.1
2. Deep Well Injection	0	0	0	0	+	0	4.8
3. Carbon Adsorption	+	+	+	+	+	0	1.8
4. Air Stripping	+	+	+	+	+	+	2.2
5. Catalytic Dehydro-chlorination	+	+	+	+	+	0	6.3

TABLE 2

APPLICABLE OR RELEVANT AND APPROPRIATE ENVIRONMENTAL LAWS AND REGULATIONS
FOR EACH ALTERNATIVE

Industrial Transformers

Law or Regulation	Analysis	Implementation of Alternative meets Applicable and Relevant and Appropriate Regulations for Alternative Number				
		1	2	3	4	5
Federal						
Resource Conservation and Recovery Act (RCRA)*	Implementation of this alternative will be consistent with current RCRA regulations and land disposal restrictions including standards for owners and operators of hazardous waste treatment, storage, and disposal facilities and closure performance standards.	NA	A	A	NA	A
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)	Implementation of this alternative is consistent with appropriate remedial actions and removal operations.	A	A	A	A	A
Superfund Amendments and Reauthorization Act (SARA)	Implementation of this alternative meets the preferences of SARA (reduction of toxicity, volume, and mobility)	No	No	Yes	Yes	Yes
Department of Transportation (DOT) Hazardous Materials Transport Rules	Implementation of this alternative may include the off-site transport of hazardous materials. The transport of these materials will be in compliance with these rules, including use of	NA	A	A	A	A

A - Applicable
R - Relevent and appropriate
Yes - Meets the requirements of the law

No - Does not meet the reqirements of the law
NA - Not an ARAR

APPLICABLE OR RELEVANT AND APPROPRIATE ENVIRONMENTAL LAWS AND REGULATIONS
FOR EACH ALTERNATIVE

Industrial Transformers

Law or Regulation	Analysis	Implementation of Alternatives meets Applicable or Relevant and Appropriate Regulation for Alternative Number				
		1	2	3	4	5
Federal						
	(cont.) properly constructed and marked transport vehicles, use of a licensed transporter, and use of hazardous waste manifests.					
Clean Air Act (CAA) and National Ambient Air Quality Standards (NAAQS)	Implementation of this alternative will comply with Federal emission standards. with Federal emission	NA	NA	NA	A	A
Clean Water Act	Implementation of this alternative will result in compliance with Federal Water Quality Criteria in surface water and National Pollutant Elimination System regulatons.	No	R	R	R	R
State						
Texas Clean Air Act	Implementation of this alternative will comply with the Texas Clean Air Act.	NA	NA	NA	A	A
Texas Solid Waste Disposal Act	Implementation of this alternative will be consistent with current State solid waste disposal laws.	NA	A	A	NA	A

* RCRA requires that contamination either be removed to background concentrations or other standard protective of human health or the environment (closure as a storage unit by removal) or capped (closure in place as a landfill).

A - Applicable
R - Relevent and appropriate
Yes - Meets the requirements of the law
No - Does not meet the reqirements of the law
NA - Not an ARAR

and volume reduction because it does nothing to reduce these parameters. Deep well injection does reduce the mobility of waste, however, not as permanently as the three treatment alternatives; therefore, it rated a "0" for mobility reduction. The three other alternatives all rated a "+" for toxicity, volume and mobility reduction because they removed the hazardous compound from the site and reduced the volume. In the ultimate disposal of the by-products the TCE may be destroyed (i.e., througn the incineration of the carbon).

3. Short Term Effectiveness - The "No action" was rated "-" in relation to all other treatment alternatives because of the relative differences in time between the natural flushing action of the aquifer versus the pumping associated with the other alternatives; however, since no one is using this aquifer it does not pose a short-term health risk. Deep well injection rated a "0" because it requires transporting the wastes off site which may pose a threat to the community or the environment during implementation of the alternative if a spill occurred. The other pumping alternatives rated "+" because they pose little threat to the community and the environment and they return the aquifer to a potentially useable water source in a short time compared to the "No Action" alternative.

4. Long Term Effectiveness - "No Action" does nothing to remediate the effect of the contamination on site; therefore, it was rated a "-". The action alternatives do alleviate the health threat and return the aquifer to useable water source. Therefore, they all rated a "+".

5. Implementability - The "No Action" and air stripping alternatives are the most easily implementable alternatives, therefore, they rated a "+". Deep well injection may be more difficult to implement because the possibility exists that a deep well injection facility may not be available to receive all of the fluid withdrawn over the life of the remedy. For this reason deep well injection rated a "0". Carbon adsorption is well proven and generally easily implemented. However, the groundwater has an abundance of dissolved solids which may decrease the life of the carbon, therefore, it rated a "0". Catalytic Dehydrochlorination is an innovative technology and will require a more extensive treatability study than the other alternatives. Specialists will be needed to set up and run the treatability studies and teach the operators about the system, so it was also rated "0".

6. Cost - Estimated costs for each remedial action alternative are summarized on Table 3. Included in this table are capital costs, annual operations and maintenance cost, present worth of operation and maintenance cost and total present worth.

Because the plume in the second water bearing zone is not defined, a sensitivity analysis was performed relating the volume of water to cost. Scenario A assumes ten wells would be installed. Each well would pump 350 gallons per day for ten years (12 million gallons). Scenario B assumes 50 wells will be installed, with each well pumping

TABLE 3

SUMMARY OF COSTS FOR 4% INTEREST RATE

Remedial Alternative	Capital Cost	Annual Operation and Maintenance	Present Worth of O & M at 4% for 10 years	Total Present Worth
Groundwater				
1. No Action	$ 83,766	$ 40,375	$ 327,481	$ 411,248
2. Collection and Off-Site Deep Well Injection	473,787	532,137	4,316,167	4,789,955
3. Collection, On-Site Carbon Adsorption, and Discharge	630,348	154,738	1,255,076	1,885,424
4. Collection, On-Site Stripping, and Discharge	606,719	197,038	1,598,171	2,204,890
10. Collection, On-site Catalytic Dehydrochlorination, and Discharge	861,093	674,537	5,471,173	6,332,267
Discharge Options				
1. Reinjection	51,778	5,163	41,873	93,651
2. Discharge to POTW	5,626	25,550	207,236	212,862

at a rate of 350 gallons/day over a ten year period (64 million gallons). As the volume of water pumped increases, the cost per gallon decreases for carbon adsorption and air stripping. Air stripping becomes the most cost effective.

The results of the sensitivity analysis are summarized on Table 4.

7. Community Reaction - The public comment period began August 10, 1988, and ended September 10, 1988. The meeting was held August 24. Two comments were received during the public meeting and several throughout the comment period. All the comments and the Agency's responses are provided in Attachment B.

8. State Acceptance - The State of Texas has been consulted and supports this remedy.

9. Overall Protection of Human Health and the Environment - All pumping alternatives can potentially reduce groundwater contamination and thereby be protective of human health and the environment, therefore they rated a "+" while the "No Action" was rated a "-" because it does nothing to protect human health and the environment.

RECOMMENDED REMEDY: Air Stripping

Treatability studies will be conducted during the design phase of the project. Additional hydrogeological studies will also be conducted during the design stage to define the extent of the plume in the second water-bearing zone. The contaminated groundwater will be recovered and the suspended solids allowed to settle. The water will be pumped into a packed air column, sprayed onto the packing coming in contact with the air. The TCE will evaporate as it comes in contact with the air. The air will be monitored as it is released out of the column. If the released air does not meet Texas Air Control Board air quality criteria, a carbon adsorption unit will be added to the air stripping column. After the concentration of TCE in the water is reduced below .005 ppm, the water will be discharged into the Houston sanitary sewer system or reinjected into the water-bearing zones.

The groundwater will be sampled and analyzed while the remedy is in operation. EPA anticipates that the concentration of TCE in the recovered groundwater will decrease over time. Should the sampling results indicate that the concentration of TCE is not decreasing, the feasibility of achieving the remedial criteria in a reasonable period of time and the possibility of revising or terminating the remedial action will be evaluated.

Rationale

As previously stated, based on the information available to evaluate the five remedial options against these nine criteria, the EPA has concluded that Alternative 4, Air Stripping, is the Agency's preferred alternative.

TABLE 4

SENSITIVITY ANALYSIS OF ALTERNATIVES
PRESENT WORTH COSTS

		SCENARIO	
	ALTERNATIVE	A	B
1.	No Action	$411,248	$411,248
2.	Deep Well Injection	$4,789,955	$20,960,117
3.	Carbon Adsorption	$1,885,424	$3,951,900
4.	Air Stripping	$2,204,890	$3,077,547
5.	Catalytic Dehydro-chlorination	$6,332,267	$14,001,398

This alternative is more easily implemented than carbon adsorption because of the dissolved solids in the aquifer. There will also be less materials handling required for the air stripping alternative than the carbon adsorption alternative. This alternative is protective of human health and the environment, attains all applicable or relevant and appropriate Federal and State requirements and is cost-effective. This alternative also satisfies SARA's preference for a remedy which employs treatment as the principal element to reduce toxicity, mobility, or volume.

Operation and Maintenance (O&M)

The site will be monitored during and after remediation for evaluation of effectiveness of the alternative. The monitoring will be accomplished by sampling the groundwater on a selected interval and analyzing for TCE to determine if remediation is continuing as planned.

Future Actions

No future actions are anticipated for the groundwater. The selected remedial action will afford a high degree of permanence.

Tentative Remedial Action Schedule

Approval Remedial Action (Sign ROD)	September 1988
Complete Enforcement Negotiation	Febuary 1989
Award Cooperative Agreement Amendment for Design of Approved Remedy	September 1989
Start Design	September 1989
Complete Design	October 1990
Award Remedial Cooperative Agreement Amendment for Construction of Approved Remedy	November 1990
Start Construction	May 1991
Complete Remediation	July 2001

ATTACHMENT A

ADMINISTRATIVE RECORD INDEX

ADDENDUM

SITE NAME: Sol Lynn Phase II
SITE NUMBER: TXD 980873327

DOCUMENT NUMBER: 123
DOCUMENT DATE: 02/02/88
NUMBER OF PAGES: 001
AUTHOR: Arthur Talley
COMPANY/AGENCY: Texas Water Commission
RECIPIENT: Sherry Fuerst, U.S. EPA Region VI
DOCUMENT TYPE: Record of Communication
DOCUMENT TITLE: Acccess agreement for groundwater sample for Sol Lynn

DOCUMENT NUMBER: 124
DOCUMENT DATE: 03/30/88
NUMBER OF PAGES: 001
AUTHOR: Sharon E. Fuerst, Regional Project Manager
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: Robert Rountree, Texas Water Commission
DOCUMENT TYPE: Correspondence
DOCUMENT TITLE: Transmittal of EPA's final comments for the Industrial Transformer Remedial Investigation and Feasibility Study Reports

DOCUMENT NUMBER: 125
DOCUMENT DATE: 04/04/88
NUMBER OF PAGES: 014
AUTHOR: Carl R. Hickam, R.S., Senior Regional Representative
COMPANY/AGENCY: Agency for Toxic Substance and Disease Registry/ROHR-Region VI
RECIPIENT: Carl Edlund, Chief, Superfund Program Branch
DOCUMENT TYPE: Correspondence and Attachment
DOCUMENT TITLE: Draft Health Assessment for the Industrial Transformers site; provides findings and recommendations regarding public health issues and or concerns for this site and adjacent areas

ADMINISTRATIVE RECORD INDEX

ADDENDUM

SITE NAME: Sol Lynn Phase II
SITE NUMBER: TXD 980873327

DOCUMENT NUMBER: 126
DOCUMENT DATE: 04/06/88
NUMBER OF PAGES: 001
AUTHOR: Robin Gelston-Walls, Texas State Coordinator, State Programs Section
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: David H. Sorrells, Texas Water Commission
DOCUMENT TYPE: Correspondence w/o referenced enclosures
DOCUMENT TITLE: Transmittal of signed copies of Record of Decisions, including the Industrial Transformer/Sol Lynn site

DOCUMENT NUMBER: 127
DOCUMENT DATE: 04/07/88
NUMBER OF PAGES: 002
AUTHOR: John Floeter for Robert E. Layton Jr., P.E., Regional Administrator
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: Honorable Martin Frost, Member, United States House of Representatives
DOCUMENT TYPE: Correspondence
DOCUMENT TITLE: Explanation of involvement of Sol Lynn

DOCUMENT NUMBER: 128
DOCUMENT DATE: 04/14/88
NUMBER OF PAGES: 001
AUTHOR: Greg Tipple for David H. Sorrells, P.E., Chief, Superfund Section, Hazardous and Solid Waste Div.
COMPANY/AGENCY: Texas Water Commission
RECIPIENT: Lawrence M. Kagan, Kagan-Edelman Enterprises
DOCUMENT TYPE: Correspondence
DOCUMENT TITLE: Industrial Transformer Superfund Site; request that the right-of-entry to property for access to monitoring well not be terminated

ADMINISTRATIVE RECORD INDEX

ADDENDUM

SITE NAME: Sol Lynn Phase II
SITE NUMBER: TXD 980873327

DOCUMENT NUMBER: 129
DOCUMENT DATE: 04/15/88
NUMBER OF PAGES: 001
AUTHOR: Julie T. Cadogan
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: Sherry Fuerst, U.S. EPA Region VI
DOCUMENT TYPE: Record of Communication
DOCUMENT TITLE: Air Stripper regulations

DOCUMENT NUMBER: 130
DOCUMENT DATE: 04/26/88
NUMBER OF PAGES: 001
AUTHOR: Robert Rountree, Remedial Investigation Unit, Superfund Section, Hazardous and Solid Waste Division
COMPANY/AGENCY: Texas Water Commission
RECIPIENT: Thomas W. Hoskings, Ph.D., P.E., Department Head, Radian Corporation
DOCUMENT TYPE: Correspondence
DOCUMENT TITLE: Confirmation of conversation on 04/15/88 which discussed the Objective and Criteria for the Industrial Transformer site

DOCUMENT NUMBER: 131
DOCUMENT DATE: 05/24/88
NUMBER OF PAGES: 003
AUTHOR: Carl E. Edlund, Chief, Superfund Program Branch
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: Carl Hickam, RS, Senior Regional Representative, ATSDR/ROHR-Region VI
DOCUMENT TYPE: Memorandum and Attachment
DOCUMENT TITLE: Comments on Draft Health Assessment for the Industrial Transformers Site

ADMINISTRATIVE RECORD INDEX

ADDENDUM

SITE NAME: Sol Lynn Phase II
SITE NUMBER: TXD 980873327

DOCUMENT NUMBER: 132
DOCUMENT DATE: 07/08/88
NUMBER OF PAGES: 001
AUTHOR: Jon Rauscher
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: Sherry Fuerst, U.S. EPA Region VI
DOCUMENT TYPE: Memorandum
DOCUMENT TITLE: Comment on the excess cancer risk from exposure to trichloroethylene at the Industrial Transformer Superfund Site

DOCUMENT NUMBER: 133
DOCUMENT DATE: 07/12/88
NUMBER OF PAGES: 005
AUTHOR: Robert Rountree, Remedial Investigation Unit
COMPANY/AGENCY: Texas Water Commission
RECIPIENT: Texas Water Commission Files
DOCUMENT TYPE: Memorandum and Attachments
DOCUMENT TITLE: Industrial Transformers-Meeting with Bill Chadick, ERT & Jim Mutch, Gulf States Utilities, Date: 07/07/88; meeting to discuss the results of the groundwater analyses

DOCUMENT NUMBER: 134
DOCUMENT DATE: 07/19/88
NUMBER OF PAGES: 013
AUTHOR: Sherry Fuerst, Texas Remedial Section
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: Robert Rountree, Texas Water Commission
DOCUMENT TYPE: Correspondence and Attachments
DOCUMENT TITLE: EPA's comments based on review of the Site Investigation, Feasibility Study and Quality Assurance/Quality Control Reports

ADMINISTRATIVE RECORD INDEX

ADDENDUM

SITE NAME: Sol Lynn Phase II
SITE NUMBER: TXD 980873327

DOCUMENT NUMBER: 135
DOCUMENT DATE: 07/20/88
NUMBER OF PAGES: 007
AUTHOR: Robert Rountree, Remedial Investigation Unit, Superfund Section, Hazadous and Solid Waste Division
COMPANY/AGENCY: Texas Water Commission
RECIPIENT: Tom Hoskings, Radian Corporation
DOCUMENT TYPE: Correspondence
DOCUMENT TITLE: Remedial Investigation/Feasibility Study Phase II Comments as discussed in the meeting held 06/30/88

DOCUMENT NUMBER: 136
DOCUMENT DATE: 07/21/88
NUMBER OF PAGES: 177
AUTHOR: Riaz Ahmed, Program Manager, Thomas Hoskings, Project Director, and Mary McGill, Geologist
COMPANY/AGENCY: Radian Corporation
RECIPIENT: Sherry Fuerst, Remedial Project Manager, U.S. EPA Region VI
DOCUMENT TYPE: Correspondence and Final Draft Report
DOCUMENT TITLE: Investigation Report, Phase II Groundwater Contamination, Industrial Transformer Superfund Site, Houston, Texas; objective is to assess extent of contamination in water-bearing zones

DOCUMENT NUMBER: 137
DOCUMENT DATE: 07/21/88
NUMBER OF PAGES: 235
AUTHOR: Riaz Ahmed, Program Manager, Thomas Hoskings, Project Director, Karen Miller and Mark Colonna, Engrs
COMPANY/AGENCY: Radian Corporation
RECIPIENT: Sherry Fuerst, Remedial Project Manager, U.S. EPA Region VI
DOCUMENT TYPE: Correspondence and Final Draft Report
DOCUMENT TITLE: Feasibility Study, Phase II, Groundwater Contamination, Industrial Transformer Superfund Site, Houston, Texas; objective is to document findings of TCE

ADMINISTRATIVE RECORD INDEX

ADDENDUM

SITE NAME: Sol Lynn Phase II
SITE NUMBER: TXD 980873327

DOCUMENT NUMBER: 138
DOCUMENT DATE: 07/21/88
NUMBER OF PAGES: 038
AUTHOR: Riaz Ahmed, Ph.D., P.E., Program Manager, and Thomas Hoskings, Ph.D., P.E., Project Director
COMPANY/AGENCY: Radian Corporation
RECIPIENT: Sherry Fuerst, Remedial Project Manager, U.S. EPA Region VI
DOCUMENT TYPE: Correspondence and Final Draft Report
DOCUMENT TITLE: Phase II Quality Assurance and Quality Control Report, Industrial Transformer Superfund Site; a system of checks which enables documentation of data reliability

DOCUMENT NUMBER: 139
DOCUMENT DATE: 08/10/88
NUMBER OF PAGES: 003
AUTHOR: Jon Rauscher
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: Sherry Fuerst, U.S. EPA Region VI
DOCUMENT TYPE: Memorandum
DOCUMENT TITLE: Comment on the Health Assessment for the Industrial Transformer Superfund site

DOCUMENT NUMBER: 140
DOCUMENT DATE: 08/10/88
NUMBER OF PAGES: 001
AUTHOR: Community Relations Staff
COMPANY/AGENCY: U.S. EPA Region VI
RECIPIENT: Public
DOCUMENT TYPE: Public Notice
DOCUMENT TITLE: Notice of Public Availability announcing the availability of the Administrative Record for the Industrial Transformer Superfund Site

ADMINISTRATIVE RECORD INDEX

ADDENDUM

SITE NAME: Sol Lynn Phase II
SITE NUMBER: TXD 980873327

DOCUMENT NUMBER: 141
DOCUMENT DATE: 08/12/88
NUMBER OF PAGES: 001
AUTHOR: John S. Reese, P.E., General Manager
COMPANY/AGENCY: NEPCCO
RECIPIENT: Carl Edlund, Chief, Superfund Program Branch, U.S. EPA Region VI
DOCUMENT TYPE: Correspondence
DOCUMENT TITLE: Comments on possible remedies for groundwater contamination

DOCUMENT NUMBER: 142
DOCUMENT DATE: 08/16/88
NUMBER OF PAGES: 002
AUTHOR: Lawrence M. Kagan
COMPANY/AGENCY: Kagan-Edelman Enterprises
RECIPIENT: Carl Edlund, Chief, Superfund Program Branch, U.S. EPA Region VI
DOCUMENT TYPE: Correspondence
DOCUMENT TITLE: Industrial Transformer Site; Houston, Texas, comments on EPA's proposed remedial plan to remedy groundwater contamination

DOCUMENT NUMBER: 143
DOCUMENT DATE: 08/25/88
NUMBER OF PAGES: 029
AUTHOR: Mary Kay Hendricks, CSR
COMPANY/AGENCY: A Better Court Reporting Service
RECIPIENT: U.S. EPA Region VI
DOCUMENT TYPE: Public Meeting Transcript
DOCUMENT TITLE: Transcript of Proceedings for the Industrial Transformer (Sol Lynn) Superfund Site Public Meeting held August 25, 1988

ADMINISTRATIVE RECORD INDEX

ADDENDUM

SITE NAME: Sol Lynn Phase II
SITE NUMBER: TXD 980873327

DOCUMENT NUMBER:	144
DOCUMENT DATE:	09/09/88
NUMBER OF PAGES:	006
AUTHOR:	Patrick R. Cowlishaw
COMPANY/AGENCY:	Cohan, Simpson, Cowlishaw, Aranza & Wulff
RECIPIENT:	Carl Edlund, Chief, Superfund Program Branch, U.S. EPA Region VI
DOCUMENT TYPE:	Correspondence
DOCUMENT TITLE:	Industrial Transformer (Sol Lynn) Site; comments prepared by ERT regarding the Phase II Remedial Investigation Report and Feasibility Study prepared by Radian Corporation

ATTACHMENT B

Sol Lynn
Houston, Texas
Responsiveness Summary

This community relations responsiveness summary is divided into two sections:

Section I: Background on Community Involvement and Concern
This section provides a brief history of community interest and concerns raised during the remedial planning activities at the Sol Lynn Superfund site.

Section II: Summary of Public Comments Received During the Public Comment Period and the EPA Responses to Comments
Both the written and spoken comments are categorized by topics. EPA responses to these relevant major topics are also presented.

I. Background on Community Involvement

Initiation of studies on Industrial Transformer was announced by TWC at a public meeting in Houston on September 24, 1986. Evaluation of the site was divided into two separate studies: 1) surface soil contamination; 2) groundwater contamination. The study addressing surface soil contamination was completed in December 1987. On January 21, 1988, a news release was issued stating that a public meeting would be held on February 2, 1988, to discuss the proposed remedy for surface contamination at the site.

An EPA prepared fact sheet which described alternative remedial actions for the soil contamination along with the EPA preferred alternative was sent to the interested and affected public shortly after the public meeting was announced. EPA and TWC conducted the 7:00 pm public meeting at the Astro Village Hotel on February 2, 1988. Approximately 35 people attended the public meeting.

On August 8, 1988, a news release announced that a public comment period on the groundwater study would begin on August 10, 1988 and end on September 9, 1988. The news release also announced that a public meeting would be held on August 25, 1988, at the Astro Village Hotel, Houston, Texas.

An EPA prepared fact sheet describing the alternative remedial actions for the groundwater study along with the EPA preferred alternative was sent to the site mailing list shortly after the meeting and comment period was announced. EPA and TWC conducted the 7:00 p.m. public meeting on August 25. Approximately 15 people attended the meeting. Only two questions were asked and no comments were made during the public meeting.

II. Summary of Public Comment Received During Public Comment Period and Agency Responses

This section gives the EPA's responses to the comments received during the public comment period. There were two verbal comments made at the public meeting and nine written comments received by the EPA during public comment.

A. Comments at the public meeting

i. By Ray McMullen on behalf of a landowner.

Comment #1

Who is responsible for the fence, barrels and other debris on the land next to the contaminated area?

Response

The property owner signed an access agreement with the Texas Water Commission. This access agreement gave the Texas Water Commission the right to use the land. The Texas Water Commission is responsible for removing the fence, barrels and any other material generated during its investigation.

Comment #2

The name I've seen associated with the cause of the contamination is Sol Lynn. What happened to him and is he paying for any of the cleanup or is it only being funded by the Superfund?

Response

The Environmental Protection Agency has been in contact with Mr. Lynn and other potentially responsible parties to try to recoup the expenses of the remedial actions which have occurred and which are scheduled to occur at the site.

ii. Comments by Steve Hupp of the Harris County Pollution Control.

Comment #3

What is the anticipated total amount of TCE emitted into the air during the life of this project? What air cleaning equipment was considered to eliminate the TCE emissions into the atmosphere? What is the odor threshold for TCE?

Response

We estimate 50 pounds per year of TCE will be emitted into the air if no emission control devices are used and less than 10 pounds per year if any are used.

The carbon adsorption canister was the only emissions control device considered during the feasibility study.

The lowest reported odor threshold limit is 1.134 mg/m^3.

B. Written Comments

i. Lawrence Kagen of Kagen-Edelman Enterprises, an adjacent landowner:

Comment #4

I am concerned about the subsidence danger to my property caused by the EPA withdrawing groundwater from the property. Who will be responsible for the damage caused to my property by the settling and possible flooding caused by the lower ground elevation caused by the withdrawal of the groundwater?

Response

The City of Houston is experiencing subsidence problems from groundwater pumpage. The majority of this subsidence problem is from pumping of municipal wells. These wells can pump up to one million gallons of water per day. The system discussed in the Record of Decision for the remediation of the TCE contaminated groundwater would pump about 3.2 million gallons over a 10 year period. We estimate the subsidence to be less than one inch for the ten year life of the system. The subsidenece will be less if the treated groundwater is reinjected into the ground than if it is discharged into publicly owned treatment works. The discharge options will be evaluated in the remedial design stage of the project.

ii. Prepared by ERT, an engineering company, for the law firm of Cohan, Simpson, Cowlishaw, Aranz and Wulff, representing Gulf States Utilities, a potentially responsible party.

Comment #5

The volume of tricholorethylene contaminated water in the uppermost water-bearing unit may be overstated. The hydrocone testing determines groundwater quality very crudely and the data should be viewed with caution.

Response

The EPA tries to be "cautious" with our estimates erring on the side of conservatism. A sensitivity analysis was done comparing the effect of volume changes on the cost of each alternative. This analysis was considered in the alternative selection. This analysis indicated that air stripping becomes more cost effective as the volume of treated water increases.

The cone penetrometer is one of many techniques that can be utilized to trace groundwater contamination. Like most other techniques it has its limitations. Yet when evaluating its effectiveness versus cost, it proved to be a useful technique for this investigation.

Comment #6

The three monitoring wells completed in the intermediate zone are inadequate to determine the extent of contamination, the flow direction or any aquifer parameters.

Response

As stated on page 7 of the Record of Decision, these three wells were not used to define the extent of contamination. We believe three monitoring wells adequately indicate the flow direction and many other aquifer parameters. The extent of contamination will be determined during the design phase of the project.

Comment # 7

There is a probability the intermediate water-bearing unit contamination came from poor monitor well construction or from the on site groundwater production well.

Response

We disagree. Monitoring wells were installed according to approved specifications. Care was taken to avoid cross-contamination by double casing each well.

The on site groundwater production well may have contributed to the contamination by producing a vertical channel for the movement of the TCE. All wells on site not used in remediation or for postclosure monitoring will be plugged.

Comment #8

Both the upper and intermediate water-bearing units are not usable potable water supply sources because of low yield and high Total Dissolved Solids.

Response

The Total Dissolved Solids in the upper water-bearing zone ranges from about 2300 mg/l to 3700 mg/l and in the second water-bearing zone from 1000 to 1650 mg/l. Although these are higher than the secondary drinking water standard of 500 mg/l according to Chemical Analysis of Public Water Supply by the Texas Department of Health, 1983, there are numerous water supplies in Harris County and throughout the State that are within these ranges. As stated on page 7 of the Record of Decision, the EPA identifies a potential drinking water supply as any body of water under 10,000 mg/l Total Dissolved Solids; therefore, the groundwater at Industrial Transformers could not be eliminated as a potential water supply. The yield is low in these water-bearing zones, but they do provide enough water to be considered potential water supplies.

Comment #9

ERT disputes the application of drinking water standard to water bearing zones not usable for potable purposes.

Response

As stated in response to comment #8, the groundwater at Industrial Transformers is considered a potential water supply. As such, drinking water standards apply in defining the extent of remediation.

Comment #10

The impacts of groundwater remediation need to be studied before a recovery system is proposed. This includes water bearing unit yield and the potential for subsidence adversely impacting the adjacent 610 Highway.

Response

See comment #4.

Comment #11

The EPA inappropriately eliminated directly discharging groundwater to a Publicly Owned Treatment Works (POTW).

Response

As stated in the Record of Decision on pages 16 and 23, the method of discharge has not been determined. In alternatives 3, 4, and 5 discharging into a POTW and reinjection into the groundwater zone are still being considered. This decision will be made during design.

Response

As stated in the Record of Decision on pages 16 and 23, the method of discharge has not been determined. In alternatives 3, 4, and 5 discharging into a POTW and reinjection into the groundwater zone are still being considered. This decision will be made during design.

Comment #12

There is no basis for selecting air stripping over direct activated carbon treatment.

Response

The EPA disagrees. The air stripping system, as described in the Record of Decision, provides many advantages over direct carbon adsorption. The high total dissolved solids in the groundwater make carbon adsorption less effective than air stripping; other organics will compete with the TCE for adsorption sites. The high suspended solids also cause the carbon unit to clog, drastically reducing the effectiveness of the treatment process. The cost effectiveness increases with air stripping as the volume of groundwater to be treated increases. This becomes important since the volume of contaminated groundwater in the second water-bearing zone will be defined during the design phase.

ATTACHMENT C

TEXAS WATER COMMISSION

September 19, 1988

Allyn M. Davis, Ph.D., Director
Hazardous Waste Management Division
U. S. Environmental Protection Agency
Region VI
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Industrial Transformers Superfund Site
Draft Record of Decision

Dear Dr. Davis:

We have reviewed the proposed Record of Decision (ROD) for the Industrial Transformers Site. We have no objection to the selected remedy of collection, on-site air stripping, and discharge (Alternative 4) as described in the draft ROD of September 14, 1988.

Sincerely,

Allen Beinke

Allen P. Beinke
Executive Director