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SF

ICF TECHNOLOGY INCORPORATED

9720581

TO: Ed Sierra, EPA Region VI, RPO

THRU: K. H. Malone, Jr., FITOM

THRU: Timothy A. Hall, AFITOM

FROM: Pam Fetzer, FIT Geologist

DATE: June 2, 1989

SUBJECT: Preliminary Assessment under the Environmental Priorities Initiative Program for Southwestern Electric Power Company - H. W. Pirkey Power Plant, Hallsville, TX CERCLIS # TXD000726380, TDD # F-6-8904-63, PAN FTX0937RAA

X REF IN SA Vol. 1

1. SITE INFORMATION

The H. W. Pirkey Power Plant is located south of Hallsville on Route 2, Box 165, Hallsville, Texas. Site coordinates are 32° 27′ 45" N latitude and 94° 28′ 58" W longitude (2). The facility is publicly owned by Southwestern Electric Power Company (SWEPCO) of Shreveport, Louisiana.

The purpose of this investigation is to perform a Preliminary Assessment (PA) under the Environmental Priorities Initiative (EPI) Program for the Environmental Protection Agency (EPA). The FIT was also tasked to determine the net worth and sales value of the company.

SUPERFUND FILE

SEP 30 1992

REORGANIZED

2. BACKGROUND/OPERATING HISTORY

The Pirkey Power Plant began production January 3, 1985 as a lignite fired power plant. The plant burns 13,000 tons of coal each day when operating at full capacity. Pirkey's boilers produce 4.9 million pounds of steam per hour from its 56 burners which generate electricity at 24,000 volts.
In the production process, lignite is strip mined, crushed to a fine powder and blown into the furnace. Electrostatic precipitators are used to remove the fly ash from the boiler furnace. Scrubbers are used to remove sulfur dioxide from combustion gases in the furnace before they are dispersed by the stack. The combustion gases are routed from the furnace through the flue-gas desulfurization (FGD) system. The system combines sulfur oxides (from the flue-gas) and an alkaline calcium solution which contains hydroxides and carbonates. The resultant product is FGD sludge, which is mixed with fly ash to produce a filter cake, and is then deposited into the fly ash landfill on-site (Figure 1). Limestone runoff wastewater (Class I, non-hazardous, TWC

PRELIMINARY REPORT
This does not constitute
final opinion of EPA

Reviewed by GHES
Date 6/18/89
BT

106870) is generated when rainfall has come in contact with limestone, which is used in the alkaline calcium solution. The runoff is directed to the runoff basin and retained until discharged via an EPA permit (7, pg. 2). Bottom ash is the residue left in the bottom ash hopper located in the main boiler furnace. The ash is sluiced to two primary bottom ash settling basins and then to the secondary settling basin. The effluent is discharged and regulated under the NPDES and TDWR Wastewater Permits. The sediment from the settling basins is periodically removed to the Fly Ash/FGD Sludge/Wastewater Treatment Solids/Bottom Ash Landfill (Fly Ash Landfill). Wastewater treatment solids are also produced from the treatment of the bottom ash transport system blowdown and material storage runoff. The solids are periodically removed and disposed in the Fly Ash Landfill. Upon initial start-up, an acid solution is sent through the boiler to inhibit corrosion and scale. The effluent is discharged into the metal cleaning waste impoundment (6, Att. 7).

The waste components in fly ash, bottom ash and wastewater treatment solids are oxides of silica, iron, aluminum, titanium, calcium, magnesium, potassium, sodium, sulfur and phosphorus.

Varsol (mineral spirits) and waste oil are drummed and stored in a container storage building until they are reclaimed by Starr Solvents of Longview, Texas (6, Att. 7, pg. 4). SWEPCO also has a plant refuse landfill which receives plant generated trash. The landfill is not covered but no odors emanated from it (6, Att. 7, pg. 6).

The metal cleaning surface impoundment effluent has a pH of 1.53, which is considered hazardous. The effluent was generated when the boiler was cleaned for start-up purposes (6, Att. 7). In the March 5, 1985 plant inspection, it was noted that Halliburton used 5% hydrochloric acid and 0.25% ammonia bifluoride (properly known as ammonium difluoride) to clean the boiler (6, Att. 7, pg. 17). The Industrial Solid Waste Registration for 90 day Generator Status (Part A) lists the following hazardous wastes: spent halogen solvents, thio carbamate, 1,1,2,2-tetrachloroethene, asbestos, trichloromethane, acetone, methylbenzene and methanol. The quantity and location of these constituents are not known (6, Att. 7, pg. 6).

Analysis of a water sample, collected by the TWC on February 25, 1985 from the metal cleaning surface impoundment, detected a pH of 1.53. The duplicate sample showed a pH of 1.63. Quality control was performed by East Texas Testing Laboratory, Inc. of Longview, Texas (6, Att. 7, pg. 3,4). The sample was designated EPA WP 882-2 of 7.8/7.8.

On May 9, 1985, a composite drain analysis was conducted on effluent that was produced as a result of the "citrosolv" cleaning method. 30,000 gallons of effluent were generated from a boiler at SWEPCO's Arsenal Hill Plant. SWEPCO maintains that approximately the same material will come from the Pirkey boiler. The effluent contained the following constituents:

Pounds	Constituents
1316	Magnetite (Fe_3O_4)
305	Copper (Cu)
25	Nickel Oxide (NiO)
56	Zinc Oxide (ZnO)
88	Apatite $Ca_5(PO_4)_3(OH)$
12	Brucite [$Mg(OH)_2$]
8	Silica (SiO_2)

Samples of waste oil from the container storage area were analyzed by SWEPCO on March 5, 1986 for EP Toxicity (EP Tox) values for arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver, all of which registered below the detection limits (6, Att. 22, pg. 3). On April 30, 1986, the TWC sampled the metal cleaning waste impoundment sludge and liner core for pH values which ranged from 3.5 to 7.53. The bottom liner and the lower half of the dike were sampled by the TWC on November 5, 1987 to verify removal of the contaminated sludge and a portion of the clay liner. Analysis of samples revealed a pH range of 3.28 to 6.44 (8).

EP TOX analyses were conducted by SWEPCO at the Oil House (location undetermined) on waste lubricating greases, on January 30, 1987 for detection of arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, vanadium and zinc. Analytical results registered below detection limits, except for the following:

	Zinc	Copper	Vanadium
Lidok EP-2 (A)	7.4		
Lidok EP-1 (B)	6.7		
Unirex N-2 (C)	3.7		
Unirex N-2 (D)	0.40	.06	0.8
Lidok EP-1 (E)	8.8		

Values are reported in mg/l. The analysis method was not reported (7, pg. 4, 5, 10, 15, 16). QA/QC procedures and duplicate samples were not analyzed.

An off-site reconnaissance inspection was not conducted because the plant impoundments are not accessible via a public road and the interior of the container storage area is not accessible to the public.

The plant was issued a Texas Air Control Board construction permit (C-6269), Texas Air emissions permit (PSD - TX - 64) (6, Att. 2, pg. 2), Texas Department of Water Resources Wastewater Permit (02496) (6, Att. 2, pg. 2) and the Texas Department of Water Resources Solid Waste Registration Permit

(33240). The Solid Waste Registration Permit number has been assigned. The plant was not registered as of May 1985 but was registered by November 17, 1987 (6 Att. 6, pg. 2).

The FIT obtained information for this PA from the files of the TWC Solid Waste Management Division, RCRA and NPDES.

No emergency or remedial action is known to have taken place at the Pirkey Power Plant. The parent company of SWEPCO is the Central and South West Corporation whose net worth in 1989 is $2,514,000,000 (10). The sales value listed of SWEPCO in 1989 is $723,000,000.00 (9).

3. UNIT DESCRIPTION/WASTE CONTAINMENT/HAZARDOUS SUBSTANCE IDENTIFICATION

The following section describes 12 solid waste management units (SWMUs) at the Pirkey Power Plant. All of the SWMUs are RCRA-regulated based on CFR 264.90, Sub-Section F.

1. Metal Cleaning Surface Impoundment

Located northwest of the main plant area and south of bottom ash basin No. 1 (Figure 1), this unit stores acid waste that was used to clean the boilers during the start-up phase of the plant. The effluent was scheduled to be neutralized prior to treatment and discharged through an NPDES outfall. During its February 21, 1985 inspection, the TWC detected a pH of 1.53, which indicated that the waste was not neutralized. As a result, the TWC required that the unit be closed. A large hole was observed in the concrete splash pads at the impoundment (6, Att. 6, pg. 4). SWEPCO submitted a closure plan to the TWC on May 14, 1985, but the unit has not been closed. The impoundment had been used only once for metal cleaning wastewater. Cooling reservoir water, contaminated with small amounts of fly ash, was disposed in this SWMU, as the result of air preheater washes. The unit was installed on November 4, 1984 and has a 4,350,000 gallon capacity. During the Loss of Interim Status (LOIS) inspection, on July 24, 1986, the unit had 90% freeboard (6, Att. E-1, E-2). The earthen dike has eroded and has no protective cover to minimize wind and water erosion (11). No overflowing has been reported. If the impoundment dikes are breached, the drainage pathway would be to the southeast toward the Brandy Branch cooling pond which is used as cooling water for the power plant (6, EPA Form 3510-3, pg 5). The permeabilities of the liner and dike are not known.

2. Chemical Sump/Neutralization System (Wastewater Treatment System)

According to the NPDES and TDWR wastewater permits, when the quality of the water warrants treatment prior to discharge, the unit will receive demineralizer regenerant wastewater (both acid and caustic), laboratory wastes, bottom ash transport system blowdown, material storage runoff and metal cleaning wastewater. The unit was active when the plant began production on January 3, 1985 (6, Att. B-4). The laboratory wastes include organic solvents and other chemicals used in analyses for NPDES

permits (6, Att B-5). The demineralizer regenerant wastes neutralize each other and are stored in neutralization tanks, which are also called wastewater treatment tanks and are located west and adjacent to the main plant area (Figure 1). The exact quantity of waste received is not known. The chemical sump is underground in the main plant area and has a synthetic liner of undetermined dimensions. Wastes are continuously neutralized and sent to the bottom ash ponds. The unit is located in the main plant area. The direction of the drainage pathways have not been determined.

3. **Drum Storage Area**

Located adjacent to the plant refuse landfill (6, Att. 22), this unit stores waste lubricating oil, Varsol and spent solvent prior to recycling. The spent solvent is generated during equipment cleaning. Approximately 5,000 gallons per year of waste oil are generated at the facility. One 55 gallon drum of Varsol has been used since plant start-up; Varsol use is now being phased out (6, Att. F-3). During the March 5, 1985 inspection, it was noted that the drums were not labeled or dated. This unit is a less than 90 day storage facility and must maintain a 30-gallon maximum to qualify as a small quantity generator (6, Att. 7, pg. 5, 17). Containment measures include a metal roof, concrete floor and drain with a catch basin in the middle to collect spillage which can then be pumped to a drum. No other containment measures are known to exist.

An April 11, 1986 inventory of the drum storage area, conducted by SWEPCO, counted the following stock: 4 barrels of Varsol solvent; 100 empty barrels, crushed and deposited in the open plant refuse cell, sold for scrap, or taken by employees; 30 barrels of rainwater, which were emptied into the plant's wastewater oil skimmer pit and disposed in the landfill; 15 barrels of waste oil, which have been sold to a reclaimer; one barrel of motor grease (6, Att. 22).

The drainage pathway is southeast of the site toward Brandy Branch cooling pond (2).

4. **Scrubber Sludge Landfill (Fly Ash Landfill)**

Located west of the main plant area, the landfill, also known as the Fly Ash Landfill (Figure 1), accepts fly ash, scrubber sludge, bottom ash and wastewater treatment solids. The clay-lined unit has a capacity of 13,000,000 cubic yards. 15.78 active acres (6, Att. 6, pg.3) of the original 129.65 acres are accepting the previously mentioned wastes. The surface drainage flows to the southeast toward Brandy Branch cooling pond (2). Its dimensions have not been determined.

5. **Sanitary Landfill**

The landfill holds general plant refuse such as office trash, wood, small metal items and one barrel of grease-contaminated dirt from the drum storage area. Its dimensions are 100 feet long by 30 feet wide by 10 feet deep. It became active in January, 1985 (6, Att. 3, pg. 10). The location

and pathway directions are not known.

6. **Landfill Detention Pond**

The unit is located adjacent to the Scrubber Sludge Landfill and southwest of the main plant area. It is used to retain rainfall that has come into contact with the scrubber sludges. The rain is retained until discharged via an NPDES permit. The plant began production and the unit became active on January 3, 1985 (6, Att. B-4). This unit is also known as the sludge area runoff basin (Figure 1). The material in the pond is classified by the TWC as a Class I non-hazardous waste unit (7). The drainage from this unit is to the south to Brandy Branch cooling pond (2). The capacity of the unit is not known.

7. **Secondary Ash Pond**

The clay-lined, 2.6 acre unit (6, Att. 6 pg. 3) is located northwest of the main plant area and adjacent to SWMU #10 (Figure 1). The unit became active when the plant began production (6, Att. B-4). The unit receives ash transport water that sluices the bottom ash from the boiler to the secondary ash pond. It is a Class I, non-hazardous waste unit (7). Brandy Branch, southeast of the unit, is the probable direction of the surface drainage (2). The dimensions of the unit are not known.

8. **Limestone Runoff Basin**

The clay-lined (6, Att. 6, pg. 3) unit is located northwest of the main plant area and adjacent to SWMU #11 (Figure 1). The unit has been active since January 3, 1985. The limestone runoff wastewater is generated by rainwater leaching the limestone used in the FGD process and dissolving minor amounts of calcium carbonate away from the limestone pile. The dimensions and capacity of the unit are not known. Brandy Branch cooling pond, located on the southeast side of the site, would receive the surface drainage from this unit (2).

9. **Lignite Runoff Basin**

Located southwest of the main plant area and adjacent to the lignite storage area, this approximately 4.5 acre, clay-lined unit receives rainfall that has come in contact with the lignite storage pile (7). It has been active since January 3, 1985. The units dimensions have not been determined (6, Att. 6, pg. 3). The surface drainage would flow south from this unit to Brandy Branch cooling pond.

10. **Bottom Ash Basin No. 1**

Active since January 3, 1985 (6, Att. B-4), this unit is located northwest of the main plant area and east of SWMU #11 (Figure 1). The 29 acre, clay-lined unit receives bottom ash from the boilers (6, Att. 6, pg. 3). The unit also receives demineralizer regenerant wastewater (acid and caustic) and laboratory wastes (7 pg. 3) from SWMU #2. The wastewater is neutralized in-line, but occasionally discharged unneutralized into the

basin prior to disposal into the Scrubber Sludge Landfill. Surface drainage from this unit would flow southeast to Brandy Branch cooling pond (2).

11. **Bottom Ash Basin No. 2**

Active since January 3, 1985 (6, Att. B-4), this 26 acre, clay-lined unit is located northwest of the main plant area and west of SWMU #10. This basin is not used for the overflow from SWMU #10. The unit receives bottom ash from the boilers (6, Att. 6 pg. 3), and demineralizer regenerant wastewater (acid and caustic) and laboratory wastes (7 pg. 3) from SWMU #2. The demineralizer regenerant wastewater is neutralized in-line, but occasionally is discharged unneutralized into the basin prior to disposal into the Scrubber Sludge Landfill. The dimensions of this unit are not known. Should the basin overflow, the drainage would flow to the southeast toward Brandy Branch cooling pond (2).

12. **Surge Pond**

This unit which began production on January 3, 1985, is located south of the SWMU #10 and northwest of the main plant area. No other information regarding this unit is available.

4. PATHWAY CHARACTERISTICS

Air Pathway Characteristics

No information regarding the air pathway characteristics is available. The contaminants of concern are primarily heavy metals in the form of liquids and sludges. Migration into the air pathway is unlikely. There is no documented evidence that an observed release to the air pathway has occurred.

Ground Water Characteristics

The plant is located in the West Gulf Coastal Plain in Tertiary deposits of the Reklaw Formation. This Formation consists of clay, with silty muscovitic, carbonaceous interbeds of moderate reddish-brown clay. The Reklaw Formation is approximately 100 feet thick in Harrison County (12, pg. 8).

Beneath the Reklaw Formation is the Carrizo Sand and the Wilcox Group, which are also Tertiary deposits. These units are hydraulically interconnected and generally function as a single aquifer. The aquifer is referred to as the Cypress aquifer. Consisting principally of lenticular beds of sand, silt and clay, the Cypress aquifer is approximately 900 feet thick in southwestern Harrison County (12, pg. 2). In the site area, the Cypress aquifer is approximately 600 feet thick (12, pg. 14) and the altitude of the water is approximately 92 feet below the ground surface (12, pg. 16). The closest known drinking water well to the site has a total depth of 465 feet and a static water level (below land surface) of 95.8 feet (12, pg. 40, 51). It is used for both domestic and livestock purposes. There are ten monitoring wells, of undetermined depths, located on-site. Some have static water levels

ranging from 40 to 47 feet (6, Att. E-1). The Cypress aquifer forms the uppermost aquifer under the site and is used as an area drinking water source.

The source of water for the Cypress aquifer is from precipitation which percolates downward through the zone of aeration to the zone of saturation. The net precipitation for the plant area is negative 2 inches (1).

Ground water moves through the sand beds in the Cypress aquifer from areas of recharge to areas of discharge at the slow rate of approximately 200 feet per year. The general direction of movement as well as the hydraulic gradient of the water in the site area is southerly toward the Sabine River (12, pg. 13).

Surface Water Characteristics

The local topography is gently rolling to hilly and generally rises from east to west (12, pg. 5). The area generally drains into the Sabine River. The plant site has eight outfalls (NPDES Permit 02496) into the Brandy Branch cooling pond (known locally as Pirkey Lake), on the southeast side of the plant property (6, Att. 2, pg. 8). Pirkey Lake appears to be a portion of Brandy Branch that was dammed 3 miles north of the Sabine River but the topographic maps have not been updated to show Pirkey Lake. Brandy Branch was previously known as Rodgers Lake, and encompassed a larger area (14). The plant ground slopes to the southeast toward Pirkey Lake, which is used for fishing (15). Brandy Branch flows into the Sabine River (2).

The upgradient drainage area has not been identified. Located in a 100 year floodplain, the site receives a 2 year, 24 hour average rainfall of 4.5 inches (4). The potential for flooding is not known because the elevation difference between the site and the banks of the Brandy Branch cooling pond is not known (2).

On-Site Pathway Characteristics

The facility is active, with controlled access and a fence surrounding it. The number of on-site employees and the number of employees coming into direct contact with the waste process have not been determined. Data suggest that the waste treatment process is a closed system in which contents are pumped from one SWMU to another without being handled by employees. It has not been determined how the solvents and waste oils are drummed and removed.

5. TARGETS

Harrison County is supplied by both surface and ground water for municipal and private uses. Hallsville (population 1800) has 4 wells, located approximately 5 miles northwest of the plant. The wells range in depth from 280 to 318 feet, with static water levels of approximately 100 feet (14, 12 pg 40). Hallsville has an alternate water source with Longview, which receives water from the Sabine River. The area residents receive water from private wells; no rural water districts exist in the area (14). There are approximately 87 residents within a 1 mile radius and approximately 300 within a 3 mile radius (2).

The Sabine River is the closest drinking water supply to the site, but the intake is located upstream, north of FM 259 and west of 1845 on Harrison Road. The river supplies Longview from this intake. The nearest downstream intake is in Logansport, Louisiana. Brandy Branch cooling pond is not used for a drinking water supply (14). There are no data supporting an air target or an on-site target.

6. CONCLUSIONS

The function of the plant is to produce electricity. The waste process is generated through the boiling and subsequent cooling of water used in the generation of steam.

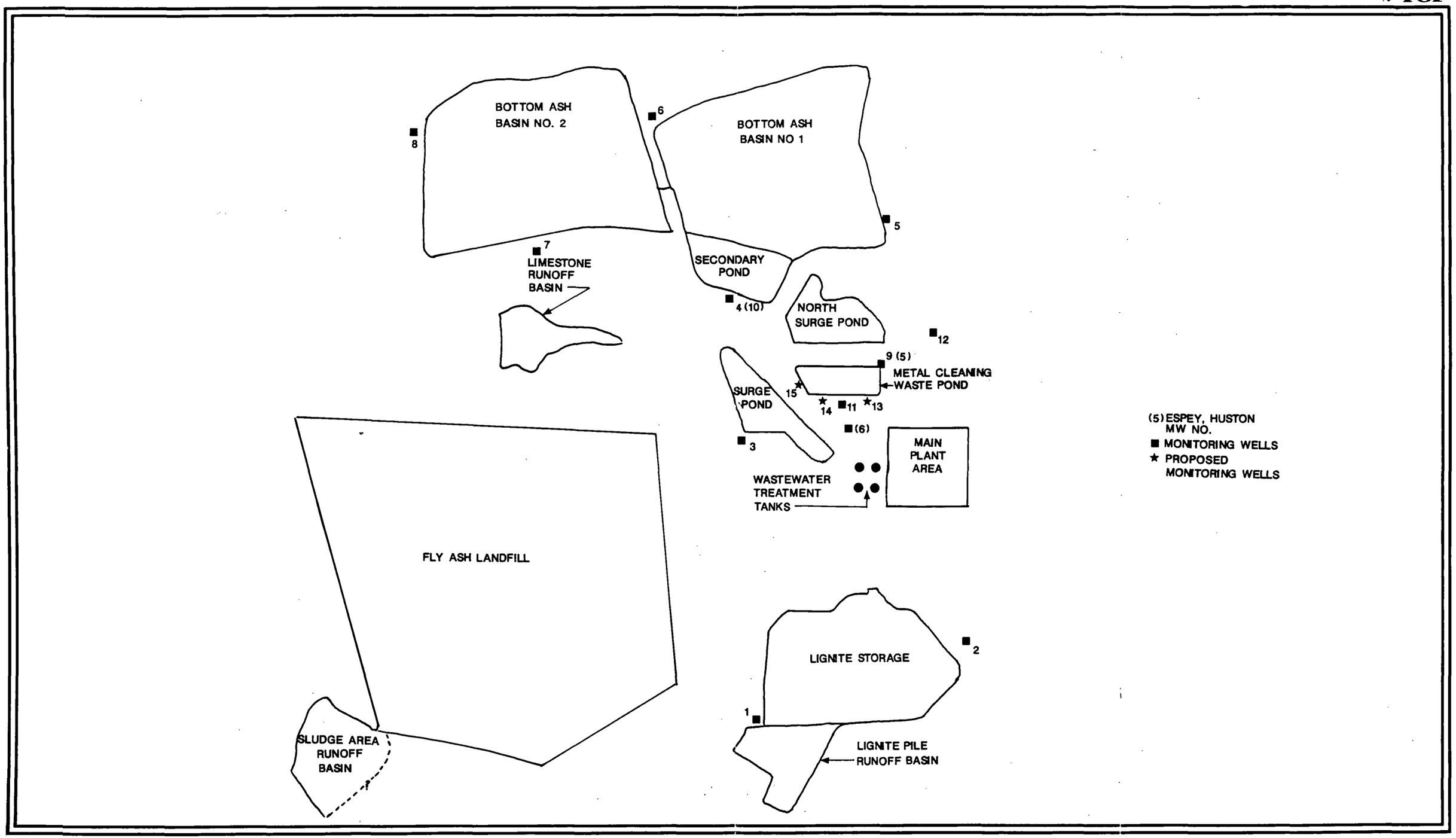
The SWMUs are the receptacles for the process water pathway. The twelve identified SWMUs include eight surface impoundments, the wastewater treatment system, the drum storage area and two landfills.

During a TWC inspection, the metal cleaning waste surface impoundment was found to have a pH of 1.53. The TWC recommended that the facility be closed. pH measurements taken on April 30, 1986, revealed a range of 3.5 to 7.53 from the impoundment sludge and liner. The bottom liner and the dike revealed a pH range of 3.28 to 6.44. The material used to clean the boiler (hydrochloric acid and ammonia difluoride) were deposited in the impoundment. Waste oils and solvents are present on-site and are drummed and stored for less than 90 days, until they are shipped off-site. Other constituents, such as the by-products of burned lignite, are considered to be non-hazardous due to their low concentrations.

The state has requested the installation of additional monitoring wells around the metal cleaning wastewater surface impoundment before allowing closure. The locations of the monitoring wells have been proposed, but it is not known if the wells have been installed.

The primary pathway of concern is ground water because the intakes for the surface water used from the Sabine River are upgradient of the site. The public water supply for the 3 mile radius is from private wells. The Cypress aquifer is the source of local ground water. The Reklaw Formation, Carrizo Sand and Wilcox Group are interconnected and comprise the Cypress aquifer. The Reklaw Formation outcrops on-site.

The static water levels are approximately 40 to 95.8 feet and the water bearing zone reaches a depth of 465 feet. The general direction of water movement is south toward the Sabine River. The water movement is slow at approximately 200 feet per year.



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NOT TO SCALE

Facility Sketch
SOUTHWESTERN ELECTRIC POWER CO.
PIRKEY PLANT
HALLSVILLE , TX
CERCLIS NO. TXD000726380

FIGURE 1

FROM
REFERENCE 6

RELEASED
Date: DW 6/19/89
RPM: ORC:

*****CONFIDENTIAL*****PRE-DECISIONAL DOCUMENT*****
PRESCORE ANALYSIS HRS SCORESHEET

Site Name:	Southwestern Electric Power Company
EPA ID No.:	TXD00072638036
TDD No.:	F-6-8904-63
City:	Hallsville
County:	Harrison
State:	Texas

Site Evaluator: Pam Fetzer
Region VI FIT Geologist

Date: May 26, 1989

POTENTIAL RELEASES

[X] Groundwater
[ ] Surface Water
[ ] Air
[ ] On-site/direct contact

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SEP 08 1992
REORGANIZED

SCORING SCENARIOS		Preliminary	Projected
GROUNDWATER ROUTE SCORE (S_{gw})	=	7.47	7.47
SURFACE WATER ROUTE SCORE (S_w)	=	4.44	4.44
AIR ROUTE SCORE (S_a)	=	0.00	0.00
TOTAL SCORE (S_M)	=	5.02	5.02

NEW HRS MODEL CONSIDERATIONS

GROUNDWATER ROUTE: Within a 3 mile radius, the population affected by ground water is approximately 800 people. A 4 mile radius would not increase the score to the value for 1,000 people.

SURFACE WATER ROUTE: The surface water intake is approximately 5 miles upstream from the plant, therefore no additional targets will be included in the new HRS model.

AIR ROUTE: No air data has been provided that extablishes a release to the air pathway. Due to the nature of the contaminants on-site, the possibility existed for hydrochloric acid fumes to be released into the air; however, the fumes would dissipate quickly.

ON-SITE ROUTE: No on-site routes have been established from the data. The plant employees could have had direct contact with the contaminant of concern. Should the employees be exposed the prescore would not change.

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****** GROUND WATER ROUTE WORKSHEET ******

	Preliminary	Reference	Projected	Reference
1 OBSERVED RELEASE	0		0	
2 ROUTE CHARACTERISTICS				
DEPTH TO AQUIFER OF CONCERN (x2)	4	6, Att. E-1; 12, pg 16	4	6, Att. E-1; 12, pg 16
NET PRECIPITATION	1	1	1	1
PERMEABILITY OF UNSATURATED ZONE	1	1; 12, pg 8	1	1
PHYSICAL STATE	3	6, Att. 7, pg 15	3	6, Att. 7, pg15
ROUTE CHARACT. SCORE =	9		9	
3 CONTAINMENT	2	6, Att. 7, pg 5	2	6, Att. 7, pg 5
4 WASTE CHARACTERISTICS:				
TOXICITY/PERSISTENCE	9	3; 6, Att 7, pg 15	9	3
HAZARDOUS WASTE QUANTITY	8	6, Att. E-1	8	6, Att. E-1
WASTE CHARACT. SCORE =	17		17	
5 TARGETS:				
GROUNDWATER USE (x3)	6	14	6	14
DISTANCE TO NEAREST WELL/POPULATION SERVED	8	12, pg 51, 14	8	12, pg 51, 14
TOTAL TARGETS SCORE =	14		14	
$\frac{(1x4x5) \text{ or } (2x3x4x5)}{57,330} \times 100$				
GROUNDWATER ROUTE SCORE =	7.47		7.47	

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***** SURFACE WATER ROUTE WORKSHEET ****

	Preliminary	Reference	Projected	Reference
1 OBSERVED RELEASE	0		0	
2 ROUTE CHARACTERISTICS:				
FACILITY SLOPE AND INTERVENING TERRAIN	2	2	2	2
1-yr, 24-hr. RAINFALL	3	1	3	1
DISTANCE TO NEAREST SURFACE WATER (x2)	6	2	6	2
PHYSICAL STATE	3	6, Att 7, pg 15	3	6, Att 7, pg 15
ROUTE CHARACT. SCORE	14		14	
3 CONTAINMENT	2	6, Att. 7, pg 5	2	6, Att. 7, pg 5
4 WASTE CHARACTERISTICS:				
TOXICITY/PERSISTENCE	9	3; 6, Att. 7, pg 15	9	3; 6, Att. 7, pg 15
HAZ. WASTE QUANTITY	8	6, Att. E-1	8	6, Att. E-1
WASTE CHARACT. SCORE	17		17	
5 TARGETS:				
SURFACE WATER USE(x3)	6	15	6	15
DISTANCE TO A SENSITIVE ENVIRONMENT (x2)	0	5	0	5
POPULATION SERVED/ DISTANCE TO DOWNSTREAM WATER INTAKE	0	14	0	14
TOTAL TARGETS SCORE =	6		6	
$\frac{(1x4x5) \text{ or } (2x3x4x5)}{64,350} \times 100$				
SURFACE WATER ROUTE SCORE =	4.44		4.44	

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***** AIR ROUTE WORK SHEET ****

	Preliminary	Reference	Projected	Reference
1 OBSERVED RELEASE	0		0	
DATE AND LOCATION:				
2 WASTE CHARACTERISTICS:				
REACTIVITY AND INCOMPATIBILITY				
TOXICITY (x3)				
HAZARDOUS WASTE QUANTITY				
WASTE CHARACT. SCORE =				
3 TARGETS:				
POP. WITHIN 4 MILES				
DISTANCE TO SENSITIVE ENVIRONMENT (x2)				
LAND USE				
TOTAL TARGETS SCORE =				
$\frac{1x2x3}{35,100}$ x 100 =				
AIR ROUTE SCORE =	0		0	

2

Preliminary S_m WORKSHEET

	S	S^2
GROUNDWATER ROUTE SCORE (S_{gw})	7.47	55.80
SURFACE WATER ROUTE SCORE (S_{sw})	4.44	19.71
AIR ROUTE SCORE (S_a)	0.00	0.00
$S_{gw}^2 + S_{sw}^2 + S_a^2$		75.51
$(S_{gw}^2 + S_{sw}^2 + S_a^2)^{1/2}$		8.69
$(S_{gw}^2 + S_{sw}^2 + S_a^2)^{1/2} / 1.73 = S_M$		5.02

2

Projected S_m WORKSHEET

	S	S^2
GROUNDWATER ROUTE SCORE (S_{gw})	7.47	55.80
SURFACE WATER ROUTE SCORE (S_{sw})	4.44	19.71
AIR ROUTE SCORE (S_a)	0.00	0.00
$S_{gw}^2 + S_{sw}^2 + S_a^2$		75.51
$(S_{gw}^2 + S_{sw}^2 + S_a^2)^{1/2}$		8.69
$(S_{gw}^2 + S_{sw}^2 + S_a^2)^{1/2} / 1.73 = S_M$		5.02

PA DOCUMENTATION LOG SHEET	SITE NAME: Southwestern Electric Power Co. CITY: Hallsville STATE: Texas IDENTIFICATION NUMBER: TXD000726380

Reference Number	Description of the Reference
1	U.S. EPA Uncontrolled Hazardous Waste Site Ranking System: A Users Manual. 47FR31219-31263. July 16, 1982, (Appendix A, CERCLA).
2	U.S.G.S. 15 minute series Topographic map. Tatum and Darco. 1958.
3	Sax, N. Irving. 1984. Dangerous Properties of Industrial Materials. Sixth Edition. Van Nostrand Reinhold Company.
4	Hershfield, David M. Rainfall Frequency Atlas of the United States. U.S. Department of Agriculture Soil Conservation Service. Technical Paper No. 40. 1961.
5	ROC. To: Dorinda Sullivan, Texas Parks and Wildlife Department. From: Don L. Hudnall, FIT Toxicologist, EPA Region VI. Re: Information on Endangered Species and Critical Habitats.
6	Schuessler, Edward. Planning Research Corporation. Southwest Electric Power Company Loss of Interim Status Inspection Report-Checklist. September 24, 1986.
7	Letter. To: Allan M. Seils, Head Technical Support Unit, Texas Water Commission. From: Brian Bond, Southwestern Electric Power Co. Re: Solid Waste Registration No. 33240 H. W. Pirkey Power Plant. December 17, 1987.
8	Memorandum. To: Sam Pole, Chief, Hazardous & Solid Waste Division, Texas Water Commission. From: William Gibson, District 5. Re: Sampling Inspection, SWEPCO - Pirkey Power Plant. November 20, 1987.
9	Dun and Bradstreet Int. Principal International Businesses. 1989.
10	Directory of Corporate Affiliations. National Register Publishing Company. 1989.
11	Gibson, William, Texas Water Commission Field Investigator. Solid Waste Compliance Monitoring Inspection Report. November 20, 1987.

PA DOCUMENTATION LOG SHEET	SITE NAME: Southwestern Electric Power Co. CITY: Hallsville STATE: Texas IDENTIFICATION NUMBER: TXD000726380

Reference Number	Description of the Reference
12	Broom, M. E. and Myers, B. N. United States Geological Survey. Texas Water Development Board Report No. 27. Ground-Water Resources of Harrison County, Texas. August, 1966.
13	Letter. To: Jay A. Pruett, Manager of Environmental Affairs, SWEPCO. From: Samuel B. Pole, Chief Hazardous and Solid Waste Division, Texas Water Commission. Re: SWR 33240 Closure Groundwater Monitoring Proposal. January 20, 1988.
14	ROC. To: Frank Craig, Water Superintendant, Hallsville, Tx. From: Pam Fetzer, FIT Geologist, EPA Region VI. Re: Water Supply for the Hallsville, TX area. May 10, 1989.
15	ROC. To: Gary Burton, Engineer - Corps of Engineers. From: Pam Fetzer, FIT Geologist, EPA Region VI. Re: Intake Locations on and uses for the Sabine River. April 28, 1989.

PA DOCUMENTATION LOG SHEET	SITE NAME: Southwestern Electric Power Co. CITY: Hallsville STATE: Texas IDENTIFICATION NUMBER: TXD000726380

Reference Number	Description of the Reference
1	U.S. EPA Uncontrolled Hazardous Waste Site Ranking System: A Users Manual. 47FR31219-31263. July 16, 1982, (Appendix A, CERCLA).
2	U.S.G.S. 15 minute series Topographic map. Tatum and Darco. 1958.
3	Sax, N. Irving. 1984. Dangerous Properties of Industrial Materials. Sixth Edition. Van Nostrand Reinhold Company.
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REFERENCE 1

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
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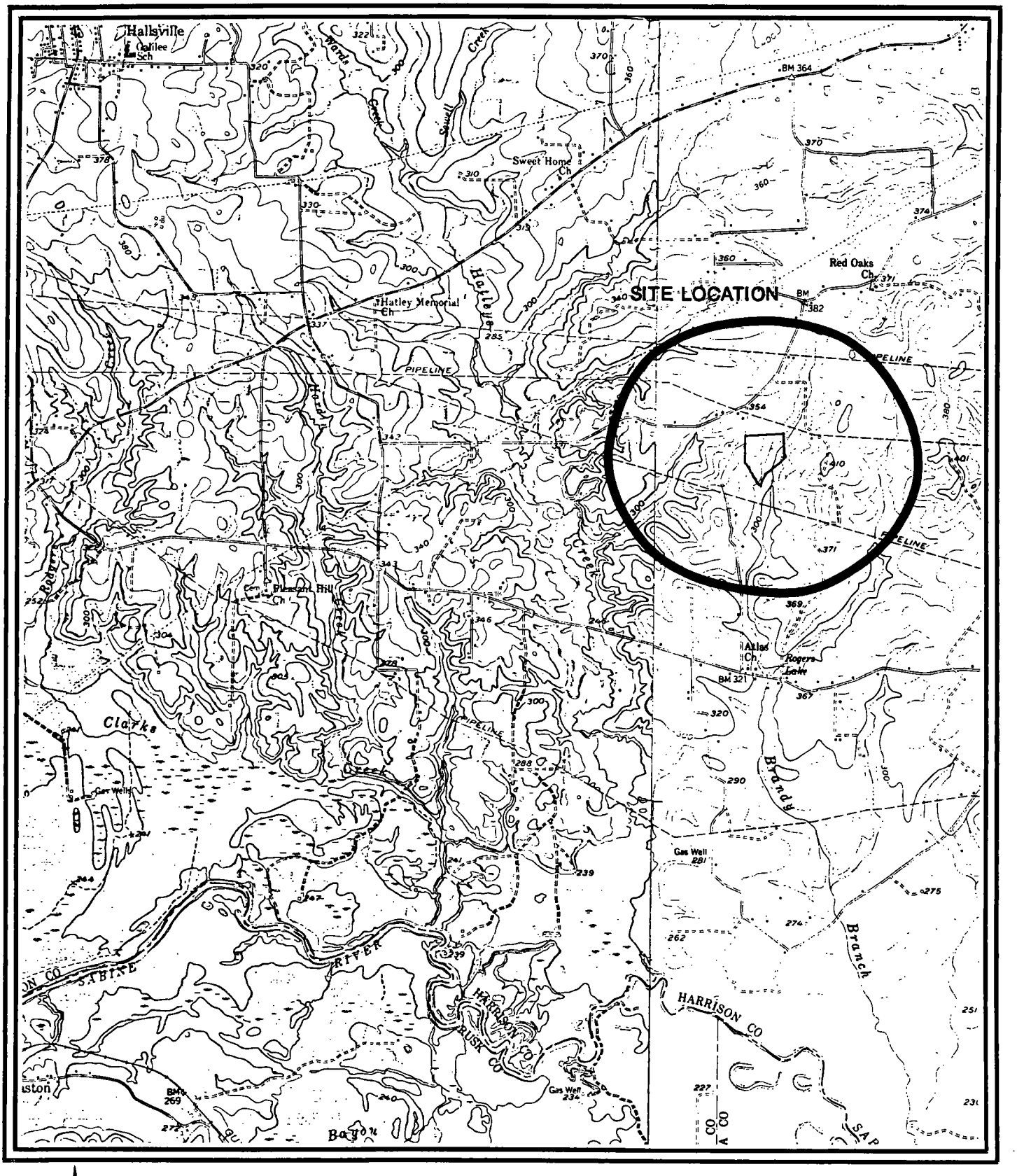
1984

REFERENCE 2

ICF



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Site Location Map

SOUTHWESTERN ELECTRIC POWER CO.

PIRKEY PLANT

HALLSVILLE, TX

TDD NO. F-6-8904-25

CERCLIS NO. TXD000726380

REFERENCE 2

QUADRANGLE LOCATION

DARCO, TX
TATUM, TX

REFERENCE 3

REFERENCE 3

Dangerous Properties of Industrial Materials

Sixth Edition

N. Irving Sax

Yellow, crystalline material; mp: decomp @ 180°; d: 1.91 @ 12°. sol in cold water.

THR: HIGH. See also chromium compounds. A powerful oxidizer.
Fire Hazard: See chromium compounds. A powerful oxidizer.
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Incomp: Reducing agents.
For further information see Vol. 2, No. 3 of *DPIM Report.*

AMMONIUM CHROMIC SULFATE

mf: $NH_4Cr(SO_4)_2 \cdot 12H_2O$; mw: 478.4

Green or violet crystals. mp: 94° (-$9H_2O$ @ 94°); d: 1.720; water sol.

THR: HIGH. See chromium compounds, sulfates.
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AMMONIUM CYANIDE

mf: NH_4CN; mw: 44.1

Solid, white powder or crystals, mp: 36° (decomp); bp: sublimes @ 40°; d: 1.002 @ 100°; vap. press: 400 ppm @ 20.5°. Very sol water, alc; decomp in hot water.

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AMMONIUM DIFLUORIDE MIXED WITH HYDROCHLORIC ACID

NIOSH #: BP 8205000

SYN: WHITE ACID (DOT)

TOXICITY DATA: 3 CODEN:
DOT-Corrosive Material, Label: Corrosive FEREAC 41,57018,76
THR: HIGH orl, skn, inhal. See also F^- and HCl. A mixture of ammonium bifluoride and hydrofluoric acid; used for etching glass. See components as listed.
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AMMONIUM DIMETHYL DITHIOCARBAMATE

CAS RN: 3226366 NIOSH #: EZ 9450000
mf: $C_3H_7NS_2 \cdot H_3N$; mw: 138.27

SYN: DIRAM A

TOXICITY DATA: 2	CODEN:
orl-rat LD50:1458 mg/kg	HYSAAV 32,169,67
orl-mus LD50:592 mg/kg	HYSAAV 32,169,67
orl-rbt LD50:450 mg/kg	HYSAAV 32,169,67
orl-gpg LD50:1680 mg/kg	HYSAAV 32,169,67

THR: MOD orl. See also thiocarbamates.
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CAS RN: 25954136 NIOSH #: BQ 4112000
mf: $H_4N \cdot C_3H_7NO_4P$; mw: 170.13

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KRENITE

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CAS RN: 13826830 NIOSH #: BQ 6100000
mf: NH_4BF_4; mw: 104.9

White, rhombic crystals; d: 1.871 @ 15°; mp: subl; sol in NH_4OH, water.

SYNS:
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AMMONIUM FLUORIDE

CAS RN: 12125018 NIOSH #: BQ 6300000
mf: $H_4N \cdot F$; mw: 37.05

Colorless crystals; mp: subl; d: 1.009 @ 25°.

SYNS:
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NEUTRAL AMMONIUM FLUORIDE

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Inventory, 1980.
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NaOCl.
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I_3.
see Vol. 2, No. 3, of *DPIM Re-*

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NIOSH #: FN 9760000
).49

CODEN:
FEREAC 41,57018,76

nt @ 100° or @ 11 hrs @ 40°
ieous sols have exploded during

o spont chemical reaction with
verful oxidizer. When contami-
may ignite.
due to shock, chemical reaction
ien contaminated it is very sensi-
ed by shock.
dangerous; can explode when
heat; when heated to decomp,
of Cl^- and NO_x.
ial, BrF_3, BrF_5.

IDE

NIOSH #: BP 4550000
)

np: 337.8°, d: 1.520, vap. press:
s).

) SAL AMMONIA
SAL AMMONIAC

3-2 CODEN:
28ZPAK -,15,72
28ZPAK -,15,72
EMSUA8 4,223,46
COREAF 256,1043,63
27ZIAQ -,39,73
HBAMAK 4,1289,35
HBAMAK 4,1289,35
HBAMAK 4,1289,35
HBAMAK 4,1289,35
JPETAB 6,595,15
AJVRAH 32,1229,71

LVS* 4,17,80. Reported in EPA

cu. MOD orl, ipr, scu. An eye
ing to food from packaging ma-
in cause nausea, vomiting and
ox by inhal. Can react violently
F_7, $KClO_3$.
heated to decomp it emits very
Cl^- and NH_3.

For further information see Vol. 2, No. 3 of *DPIM Report.*

AMMONIUM CHLOROPALLADATE (IV)

CAS RN: 13820401 NIOSH #: BP 5400000
mf: $Cl_4H_8N_2Pd$; mw: 284.30

Olive-green crystals; d: 2.17; mp: decomposes.

SYNS:
AMMONIUM TETRACHLOROPALLADATE
DIAMMONIUM TETRACHLOROPALLADATE

TOXICITY DATA:
skn-rbt 100 mg/24H SEV

CODEN:
AEHLAU 30,168,75

Reported in EPA TSCA Inventory, 1980.
THR: A skn irr. See also palladium compounds.
Disaster Hazard: When heated to decomp it emits very tox fumes of Cl^-, NO_x and NH_3.

AMMONIUM CHLOROPALLADATE (VI)

CAS RN: 19168231 NIOSH #: BP 5390000
mf: $Cl_6H_8N_2Pd$; mw: 355.20

Red-brown crystals; d: 2.418; mp: decomposes.

SYNS:
AMMONIUM HEXACHLOROPALLADATE
DIAMMONIUM HEXACHLOROPALLADATE

TOXICITY DATA:
skn-rbt 100 mg/24H SEV

CODEN:
AEHLAU 30,168,75

Reported in EPA TSCA Inventory, 1980.
THR: A skn irr. See also palladium compounds.
Disaster Hazard: When heated to decomp it emits very tox fumes of NO_x, Cl^- and NH_3.

AMMONIUM CHLOROPLATINATE

CAS RN: 16919587 NIOSH #: BP 5425000
mf: $Cl_6Pt \cdot 2H_4N$; mw: 443.89

Cubic, yellow crystals; d: 3.065; mp: decomposes.

SYNS:
AMMONIUM HEXACHLOROPLATINATE(IV)
DIAMMONIUM HEXACHLOROPLATINATE (2-)
AMMONIUM PLATINIC CHLORIDE
PLATINIC AMMONIUM CHLORIDE

TOXICITY DATA: 3
orl-rat LD50:1 mg/kg
ihl-hmn TCLo:0.9 ug/m3:PUL

CODEN:
GTPZAB 21(7),55,77
BJIMAG 2,92,45

OSHA Standard: Air: TWA 2 ug(Pt)/m3 (SCP-M) FEREAC 39,23540,74. Reported in EPA TSCA Inventory, 1980.
THR: HIGH ihl, orl. See also platinum compounds. A hmn PUL.
Disaster Hazard: When heated to decomp it emits very tox fumes of Cl^-, NO_x and NH_3.

AMMONIUM CHROMATE

mf: $(NH_4)_2CrO_4$; mw: 152.1

Yellow, crystalline material; r
@ 12°. sol in cold water.

THR: HIGH. See also chror
ful oxidizer.
Fire Hazard: See chromium
dizer.
Explosion Hazard: When sh
Disaster Hazard: Dangerous
it. When heated to decom
and NO_x.
Incomp: Reducing agents.
For further information see V

AMMONIUM CHROMIC

mf: $NH_4Cr(SO_4)_2 \cdot 12H_2O$;

Green or violet crystals. mp:
water sol.

THR: HIGH. See chromiu
Disaster Hazard: See sulfat
it emits tox fumes of NH

AMMONIUM CYANIDE

mf: NH_4CN; mw: 44.1

Solid, white powder or cry
sublimes @ 40°; d: 1.002
@ 20.5°. Very sol water, a

THR: See cyanides.
Fire Hazard: Mod, when
35° a flammable gas is
Explosion Hazard: Mod. A
sive gas is liberated. See
Disaster Hazard: See cyan
it emits tox fumes of C

AMMONIUM DIFLUOI HYDROCHLORIC AC

SYN: WHITE ACID (DOT)

TOXICITY DATA:
DOT-Corrosive Material,
41,57018,76
THR: HIGH orl, skn, in
mixture of ammonium b
used for etching glass.
Disaster Hazard: When h
tox fumes of F^-, HF a

AMMONIUM DIMETH

CAS RN: 3226366
mf: $C_3H_7NS_2 \cdot H_3N$; mw

SYN: DIRAM A

TOXICITY DATA:
orl-rat LD50:1458 mg/kg
orl-mus LD50:592 mg/kg
orl-rbt LD50:450 mg/kg
orl-gpg LD50:1680 mg/kg

RATE

Inventory, 1980.
general food additive. Can de-
NaOCl.
heated to decomp it emits tox
I_3.
see Vol. 2, No. 3, of *DPIM Re-*

ATE

NIOSH #: FN 9760000
).49

CODEN:
FEREAC 41,57018,76

nt @ 100° or @ 11 hrs @ 40°
neous sols have exploded during

o spont chemical reaction with
werful oxidizer. When contami-
may ignite.
due to shock, chemical reaction
nen contaminated it is very sensi-
ed by shock.
dangerous; can explode when
heat; when heated to decomp,
of Cl^- and NO_x.
ial, BrF_3, BrF_5.

IDE

NIOSH #: BP 4550000
)

mp: 337.8°, d: 1.520, vap. press:
s).

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SAL AMMONIAC

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mf: $Cl_6H_8N_2Pd$; mw: 355.20

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AMMONIUM HEXACHLOROPALLADATE
DIAMMONIUM HEXACHLOROPALLADATE

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THR: HIGH ihl, orl. See also platinum compounds. A hmn PUL.
Disaster Hazard: When heated to decomp it emits very tox fumes of Cl^-, NO_x and NH_3.

AMMONIUM CHROMATE

mf: $(NH_4)_2CrO_4$; mw: 152.1

Yellow, crystalline material; n
@ 12°. sol in cold water.

THR: HIGH. See also chron
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Fire Hazard: See chromium
dizer.
Explosion Hazard: When sh
Disaster Hazard: Dangerous
it. When heated to decom
and NO_x.
Incomp: Reducing agents.
For further information see

AMMONIUM CHROMIC

mf: $NH_4Cr(SO_4)_2 \cdot 12H_2O$;

Green or violet crystals. mp:
water sol.

THR: HIGH. See chromiu
Disaster Hazard: See sulfa
it emits tox fumes of NH

AMMONIUM CYANIDE

mf: NH_4CN; mw: 44.1

Solid, white powder or cr
sublimes @ 40°; d: 1.002
@ 20.5°. Very sol water,

THR: See cyanides.
Fire Hazard: Mod, when
35° a flammable gas is
Explosion Hazard: Mod.
sive gas is liberated. Se
Disaster Hazard: See cyan
it emits tox fumes of C

AMMONIUM DIFLUO HYDROCHLORIC A

SYN: WHITE ACID (DOT)

TOXICITY DATA:
DOT-Corrosive Material
41,57018,76
THR: HIGH orl, skn, in
mixture of ammonium b
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SYN: DIRAM A

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orl-mus LD50:592 mg/kg
orl-rbt LD50:450 mg/kg
orl-gpg LD50:1680 mg/kg

REFERENCE 4

PREFACE

U.S. DEPARTMENT OF COMMERCE
LUTHER H. HODGES, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

NOTICE
Rainfall-frequency information for durations of 1 hour and less for the Central and Eastern States has been superseded by NOAA Technical Memorandum NWS HYDRO-35 Five to Sixty-Minute Precipitation Frequency for the Eastern and Central United States. This publication (Accession No. PB 272-112/AS) is obtainable from:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

WASHINGTON, D.C.
May 1961

THIS ATLAS IS OBSOLETE FOR THE FOLLOWING 11 WESTERN STATES: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

NOAA ATLAS 2: PRECIPITATION-FREQUENCY ATLAS OF THE WESTERN UNITED STATES (GPO: 11 Vols., 1973) supersedes the Technical Paper 40 data for these states.

All but 3 of the 11 state volumes are out of print, and no reprint is presently planned.

Institutions in the eleven western states likely to have copies of these volumes for their state for public inspection are:

US Department of Agriculture Soil Conservation Service Offices
US Army Corps of Engineers Offices
Selected University Libraries
National Weather Service Offices (may also have volumes for adjacent states).
National Weather Service Forecast Offices (may have all eleven volumes)

Elsewhere, libraries of universities where hydrology and meteorology degree programs are offered may shelve some of the eleven volumes.

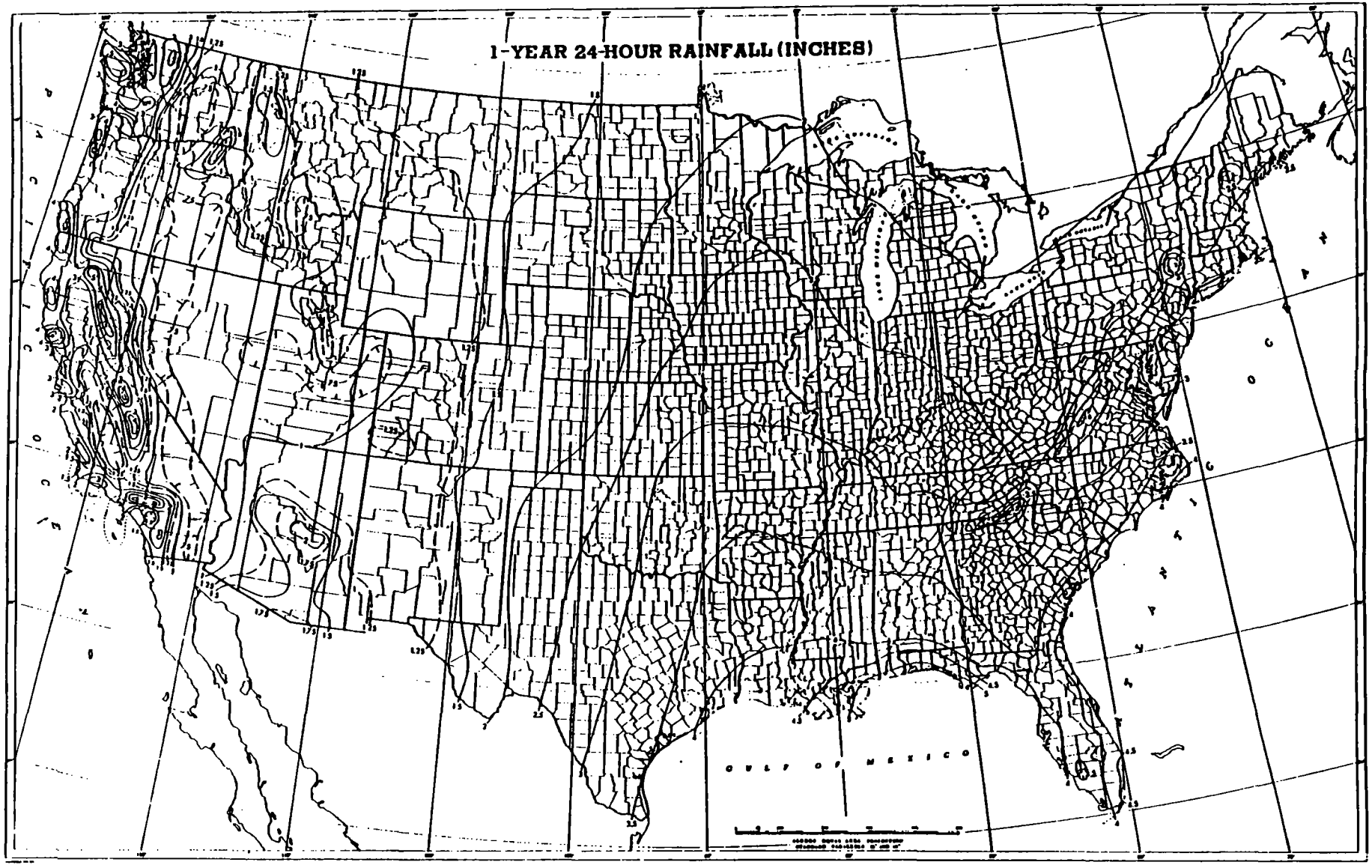
The three volumes in print as of 1 Jan 1983 at the GPO are:

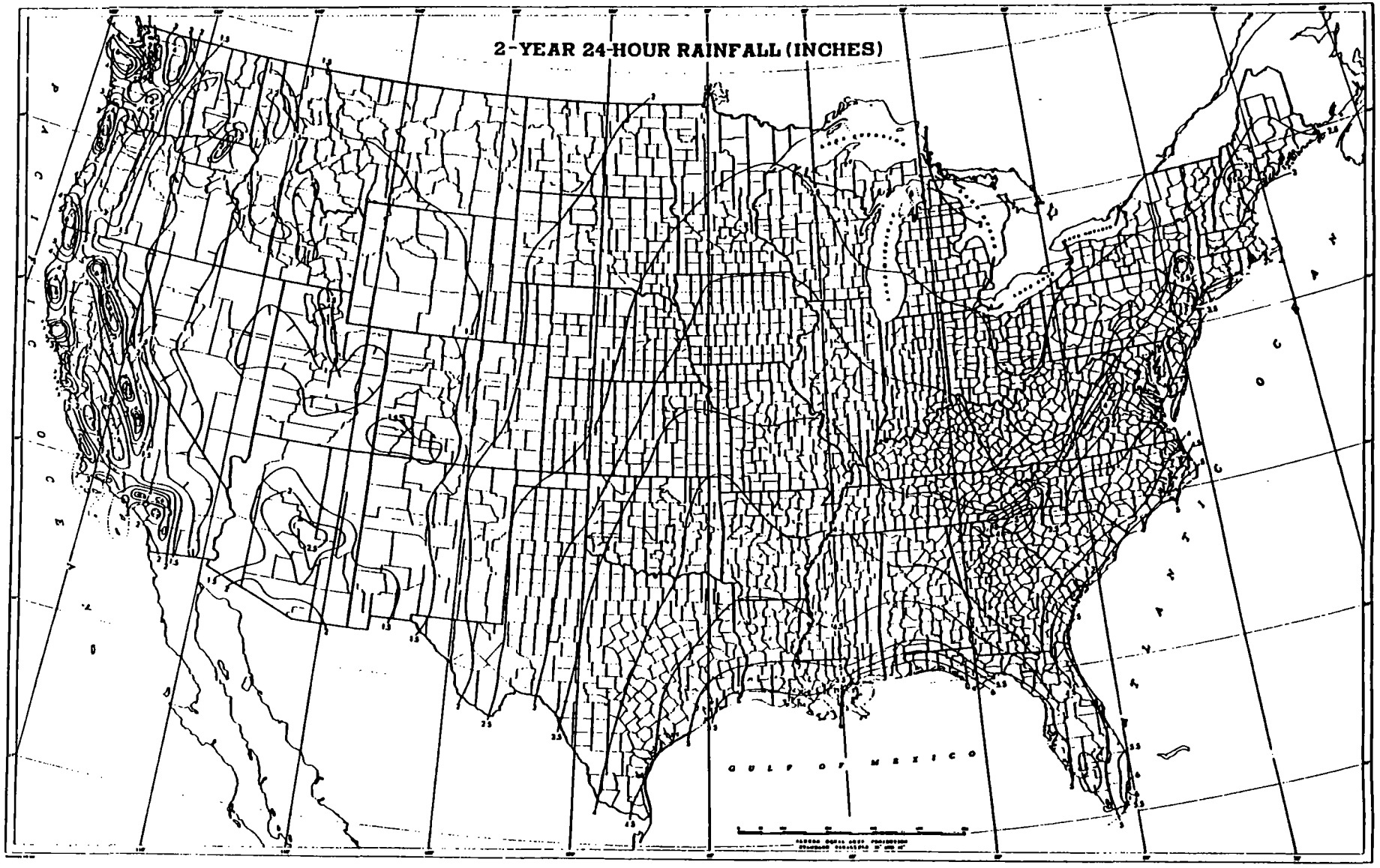
Vol	State	GPO Stock Number	Price
IV	New Mexico	003-017-00158-0	$10.00
VI	Utah	003-017-00160-1	12.00
VII	Nevada	003-017-00161-0	9.50

The GPO Order number is 202-783-3238 for VISA and MASTERCARD orders which

8011

Reference 4


1-YEAR 24-HOUR RAINFALL (INCHES)
GULF OF MEXICO


2-YEAR 24-HOUR RAINFALL (INCHES)
GULF OF MEXICO

REFERENCE 5

TEXAS
PARKS AND WILDLIFE DEPARTMENT
4200 Smith School Road Austin, Texas 78744

COMMISSIONERS

CHUCK NASH
Chairman, San Marcos

GEORGE C. "TIM" HIXON
Vice-Chairman
San Antonio

BOB ARMSTRONG
Austin

LEE M. BASS
Ft. Worth

HENRY C. BECK, III
Dallas

DELO H. CASPARY
Rockport

JOHN WILSON KELSEY
Houston

BEATRICE CARR PICKENS
Amarillo

A.R. (TONY) SANCHEZ, JR.
Laredo

CHARLES D. TRAVIS
Executive Director

May 8, 1989

Don Hudnall
ICF Technology, Inc.
1509 Main Street, Suite 900
Dallas, Texas 75201-4809

Dear Mr. Hudnall:

In response to your May 2, 1989 request for information on sensitive species and natural communities within or near five preliminary ranking sites in Dallas, Gonzales, Harris, Harrison, and Jasper counties, we offer the following comments. A search of the Texas Natural Heritage Program Information System revealed occurrences of special species, natural communities, and state managed areas in the general vicinity of the projects. Printouts and a code key are attached. A list of species, communities, and managed areas for each site follows:

DALLAS - Vireo atricapillus (Black-capped Vireo), federal and state endangered, and Cedar Hill State Park.

GONZALES - Thalictrum texanum (Houston meadow-rue), Amsonia glaberrima (smooth blue-star), Graptemys caglei (Cagle's Map Turtle), Micropterus treculi (Guadalupe Bass), all federal category 2, a Sugarberry-Elm Series natural community, Palmetto State Park, and site of the proposed Cuero Reservoir dam on the Guadalupe River downstream from Gonzales on the Gonzales South quadrangle.

HARRIS - Tympanuchus cupido attwateri (Attwater's Greater Prairie Chicken), federal and state endangered, Machaeranthera aurea (Houston machaeranthera), Chloris texensis (Texas windmill-grass), both federal category 2, and Malaclemys terrapin littoralis (Texas Diamondback Terrapin).

HARRISON - Macroclemys temminckii (Alligator Snapping Turtle), federal category 2 and state threatened, Crataegus berberifolia (barberry-leaved hawthorn), federal category 2, and Trillium pusillum var. texanum (Texas trillium).

JASPER - Phlox nivalis ssp. texensis (Texas trailing phlox), federal category 1, Physostegia longisepala (long-sepaled false dragon-head), Amsonia glaberrima (smooth blue-star), Eriocaulon koernickianum (small-headed pipewort), all three federal category 2, an American Beech-Southern Magnolia Series natural community, a Longleaf Pine-Beakrush Series natural commuity, and Village Creek State Park.

The Heritage Program information included here is based on the best data currently available to the state regarding threatened, endangered, or otherwise sensitive species. However, the data does not provide a definite statement as to the presence or absence of special species or natural communities within your project area, nor can it substitute for an evaluation by qualified biologists. It is intended to assist you in avoiding harm to species that occur on your site. Please contact the Texas Parks and Wildlife Department's Heritage Program before publishing or otherwise disseminating any specific locality information.

This letter does not constitute an assessment of fish and wildlife impacts that might result from the activity for which this information is provided. Should you need an impact assessment from the Texas Parks & Wildlife Department, contact the Environmental Assessment Branch of the Resource Protection Division, attention Mr. Bob Spain, or contact him at 512/389-4725. All requests for assessments must be in writing.

Thank you for contacting us. Please feel free to call me at 512/389-4533 if you have questions.

Sincerely,

Dorinda Sullivan

Dorinda Sullivan, Data Manager
Texas Natural Heritage Program
Resource Protection Division

Enclosures

DLS/ds

HARRISON County Site

TEXAS NATURAL HERITAGE PROGRAM
TEXAS PARKS AND WILDLIFE DEPARTMENT

05/05/89

NAME: MACROCLEMYS TEMMINCKII
COMMMON NAME: ALLIGATOR SNAPPING TURTLE
FEDERAL STATUS: C2 STATE STATUS: T
GLOBAL RANK: G3? STATE RANK: S3
IDENTIFIED: Y SENSITIVITY:
COUNTY: TXRUSK TXPANO
USGS TOPO MAPS: TATUM, FAIR PLAY
TOPO CODE: 3209435 3209425
ELEMENT OCCURRENCE NUMBER: 004
MAP MARGIN NUMBER: 1 PRECISION: S
DATE LAST OBSERVED: 1985- DATE FIRST OBSERVED:
OCCURRENCE RANK: B DATE SURVEYED:
SURVEY COMMENTS:
DIRECTIONS:
MARTIN LAKE, 3 MILES SOUTHWEST OF TATUM

DESCRIPTION OF HABITAT:

QUALITATIVE/QUANTITATIVE DATA:

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:

SOURCE OF INFORMATION:
ROGERS, TERRY. 1988. PERSONAL COMMUNICATION OF 15 JULY 1988.

TEXAS NATURAL HERITAGE PROGRAM
TEXAS PARKS AND WILDLIFE DEPARTMENT

05/05/89

NAME: CRATAEGUS BERBERIFOLIA
COMMMON NAME: BARBERRY-LEAVED HAWTHORN
FEDERAL STATUS: C2 STATE STATUS:
GLOBAL RANK: G1 STATE RANK: S1
IDENTIFIED: SENSITIVITY:
COUNTY: TXHRSN
USGS TOPO MAPS: MARSHALL EAST, MARSHALL WEST
TOPO CODE: 3209453 3209454
ELEMENT OCCURRENCE NUMBER: 001
MAP MARGIN NUMBER: 1 PRECISION: G
DATE LAST OBSERVED: 1901-10-09 DATE FIRST OBSERVED: 1901
OCCURRENCE RANK: DATE SURVEYED:
SURVEY COMMENTS:
DIRECTIONS:
MARSHALL

DESCRIPTION OF HABITAT:

QUALITATIVE/QUANTITATIVE DATA:

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:

SOURCE OF INFORMATION:
VINES, R. A. 1976. TREES, SHRUBS, AND WOODY VINES OF THE SOUTHWEST. UNIV. OF TEXAS PRESS, AUSTIN.

TEXAS NATURAL HERITAGE PROGRAM
TEXAS PARKS AND WILDLIFE DEPARTMENT

05/05/89

NAME: TRILLIUM PUSILLUM VAR TEXANUM
COMMMON NAME: TEXAS TRILLIUM
FEDERAL STATUS: 3C
STATE STATUS:
GLOBAL RANK: G2G3Q
STATE RANK: S2S3
IDENTIFIED: Y
SENSITIVITY:
COUNTY: TXHRSN
USGS TOPO MAPS: HALLSVILLE
TOPO CODE: 3209455
ELEMENT OCCURRENCE NUMBER: 009
MAP MARGIN NUMBER: 1
PRECISION: G
DATE LAST OBSERVED:
DATE FIRST OBSERVED:
OCCURRENCE RANK:
DATE SURVEYED:
SURVEY COMMENTS:
DIRECTIONS:
EAST OF HALLSVILLE.

DESCRIPTION OF HABITAT:

QUALITATIVE/QUANTITATIVE DATA:

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:

SOURCE OF INFORMATION:
AJILVSGI, GEYATA. 1984. DISCUSSION WITH TINA ALLDAY-BONDY, 25 JULY 1984.

FEDERAL STATUS

LE - Listed Endangered
LT - Listed Threatened
LELT - Listed Endangered in part of range. Threatened in a different part
PE - Proposed to be listed Endangered
PT - Proposed to be listed Threatened
PEPT - Proposed Endangered. Threatened
S - Synonyms
C1 - Candidate. Category 1. USFWS has substantial information on biological vulnerability and threats to support proposing to list as endangered or threatened. Data are being gathered on habitat needs and/or critical habitat designations.
C1* - C1. but lacking known occurrences
C1** - C1, but lacking known occurrences. except in captivity/cultivation
C2 - Candidate, Category 2. Information indicates that proposing to list as endangered or threatened is possibly appropriate. but substantial data on biological vulnerability and threats are not currently known to support the immediate preparation of rules. Further biological research and field study will be necessary to ascertain the status and/or taxonomic validity of the taxa in Category 2.
C2* - C2, but lacking known occurrences
C2** - C2, but lacking known occurrences, except in captivity/cultivation
3 - Taxa no longer being considered for listing as threatened or endangered. Three subcategories indicate the reasons for removal from consideration.
3A - Former Candidate, rejected because presumed extinct and/or habitats destroyed
3B - Former Candidate, rejected because not a recognized taxon; i.e. synonym or hybrid
3C - Former Candidate, rejected because more common, widespread, or adequately protected
blank - Not currently listed

STATE STATUS

E - Listed as Endangered in the State of Texas
T - Listed as Threatened in the State of Texas
blank - Not currently listed

GLOBAL RANK

G1 - Critically imperiled globally, extremely rare, 5 or fewer occurrences. [Critically endangered throughout range.]
G2 - Imperiled globally, very rare, 6 to 20 occurrences. [Endangered throughout range.]
G3 - Very rare and local throughout range or found locally in restricted range, 21 to 100 occurrences. [Threatened throughout range.]
G4 - Apparently secure globally.

G5 - Demonstrably secure globally.
GA - Accidental in North America, now G#NA.
GE - An exotic species established in North America, now G#NE.
GH - Of historical occurrence through its range.
GU - Uncertain; most likely rank/uncertain (G2?), range (G1G2)
GX - Believed to be extinct throughout range.
Q - Qualifier denotes questionable rank or taxonomic assignment.
T - Subrank of subspecies or variety.

STATE RANK

S1 - Critically imperiled in state, extremely rare, very vulnerable to extirpation, 5 or fewer occurrences.
S2 - Imperiled in state, very rare, vulnerable to extirpation, 6 to 20 occurrences.
S3 - Rare in state, 20+ occurrences.
S4 - Apparently secure in state.
S5 - Demonstrably secure in state.
SA - Accidental in state.
SE - An exotic species established in state.
SH - Of historical occurrence in state. May be rediscovered.
SX - Apparently extirpated from State.

PRECISION

S or SC - Occurrence mapped to seconds of latitude/longitude. SC indicates element occurrence is a confirmed occurrence.
M - Occurrence mapped to minutes of latitude/longitude, approximately 2 km or 1.5 mi radius.
G - Occurrence mapped general to quad or place name precision only, precision within about 8 km or 5 mi radius.
U - Unmappable record.

OCCURRENCE RANK

A - Excellent
B - Good
C - Marginal
D - Poor
X - Destroyed
blank - Unknown

REFERENCE 6

PRC Engineering

prc
Planning Research Corporation

SOUTHWEST ELECTRIC POWER COMPANY

U.S. EPA REGION 6

LOSS OF INTERIM STATUS INSPECTION

REPORT-CHECKLIST

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	589
EPA Region	:	VI
Site No.	:	TXD 000 726 380
Date Prepared	:	September 24, 1986
Contract No.	:	68-01-7037
PRC No.	:	15-5895-38
Prepared By	:	PRC Engineering (Edward Schuessler)
Telephone No.	:	312/938-0300
EPA Primary Contact	:	Linda Thompson
Telephone No.	:	214/767-2949

PRIVILESED WORK PRODUCT PREPARED
IN ANTICIPATION OF LITIGATION

ENFORCEMENT
CONFIDENTIAL

INSPECTION CHECKLIST

LOIS INSPECTIONS - REGION VI

Facility Name: Southwestern Electric Power Company (SWEPCO)

Henry W. Pirkey Plant

EPA I.D. No: TXD 000 726 380

Inspection Dates: July 24, 1986

Inspector(s): Michael Johnson

Susan Burns

Facility Representative(s): Michael Williams, Plant Superintendent

Brian Bond, Environmental Specialist

Bruce Wright, Environmental Specialist

Enforcement Officer:

Completed	Item	Section
X	General Information	A
X	Executive Summary	B
X	Summary Report	C
X	List of Documents	D
X	Hazardous Waste Land Disposal Unit Description	E
X	SWMU Description	F
NA	Organization Chart	
X	Facility Drawing(s)	

GENERAL INFORMATION

Facility EPA I.D. Number: TXD 000 726 380

Facility State I.D. Number (Describe): 33240 (Solid Waste Registration)

Facility Name: Southwestern Electric Power - Henry W. Pirkey Plant

Facility Primary Contact (Name and Title): Jay Pruett, Manager of Environmental Affairs 318/221-2604

Facility Mailing Address:

(Street) P.O. Box 21106

(City) Shreveport

(State) Louisiana (Zip) 71156

Facility Location:

(Street) Rte 2, P.O. Box 165

(City) Hallsville (County) Harrison

(State) Texas (Zip) 75650

Other Facility Contacts:

Name: Brian Bond Title: Environmental Specialist

Telephone: 318/221-2604 Responsibility: Ensures environmental compliance

Name: Bruce Wright Title: Environmental Specialist

Telephone: 318/221-2604 Responsibility: Ensures environmental compliance

Name: Mike Williams Title: Plant Superintendent

Telephone: 214/935-3181 Responsibility: Oversees daily operations

Name: _____ Title: _____

Telephone: _____ Responsibility: _____

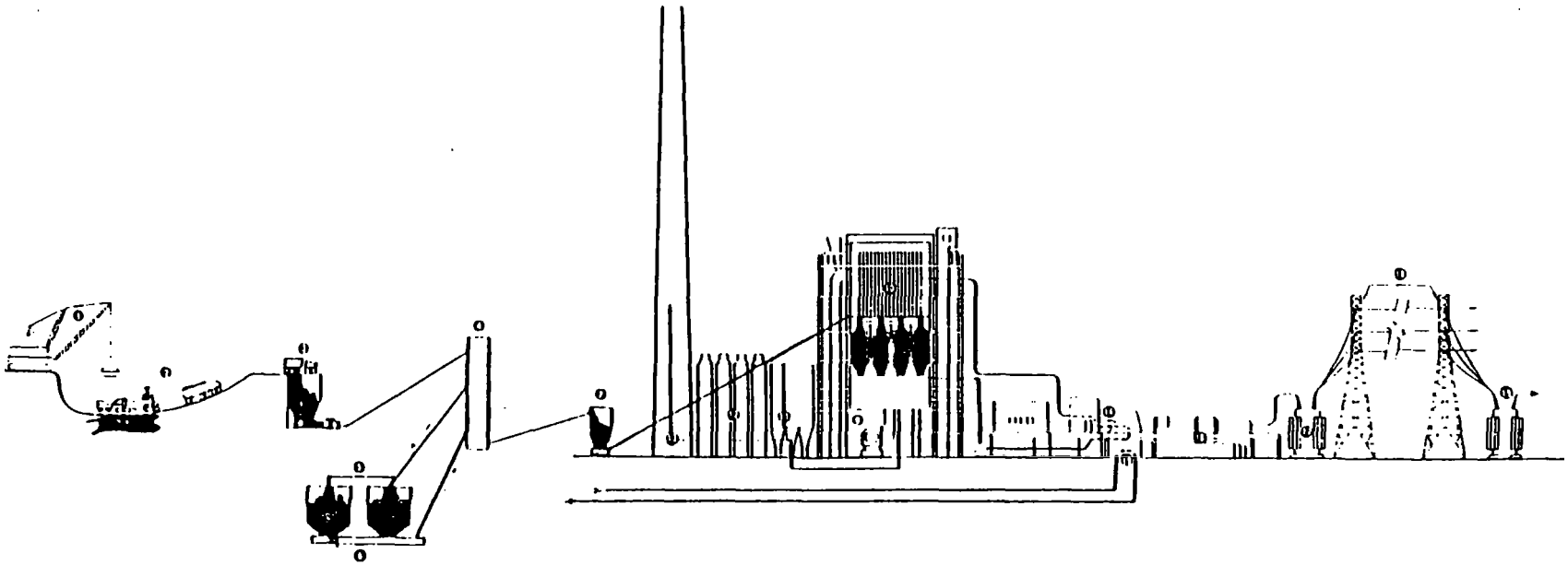
EXECUTIVE SUMMARY

On July 24, 1986, a LOIS inspection team visited the Southwestern Electric Power Company (SWEPCO)-Henry W. Pirkey Plant facility in Hallsville, Texas. The U.S. EPA Region 6 identified the plant as a hazardous waste facility that had not submitted its Part B permit application or certified compliance with ground-water and financial requirements by November 8, 1985. The LOIS team consisted of Susan Burns and Michael Johnson of PRC Environmental Management, Inc. The team met with two environmental specialists from SWEPCO's corporate office in Shreveport, Messrs. Brian Bond and Bruce Wright, and with the plant manager, Mr. Mike Williams. The following sections discuss (1) plant operations and associated solid wastes, (2) RCRA hazardous waste activities as they relate to the plant's Part A application, and (3) other findings.

Plant Operations

The Pirkey plant is a lignite coal-fired power plant. The plant uses approximately 13,000 tons of coal each day when operating at full capacity. Pirkey's boiler has 56 burners, produces 4.9 million pounds of steam per hour at 2,400 pounds per square inch, and operates at 1000°F. The plant's generator is kept at a constant speed of 3,600 revolutions per minute, producing electricity at 24,000 volts. Transformers outside the plant raise generator voltage up to 138,000 volts for transmission through SWEPCO's three-state service territory. Figure 1 shows a schematic of plant operations and Figure 2 gives the general plant layout. The facility produces six types of nonhazardous solid wastes. These include the following:

- Fly ash - particulates from electrostatic precipitators
- Flue-gas desulfurization sludge - calcium sulfites and calcium sulfates formed when sulfur oxides are removed from the gas streams
- Bottom ash - ash residue from the main boiler



HOW LIGNITE IS MINED AND USED TO GENERATE ELECTRICITY AT THE PIRKEY POWER PLANT

1 Dragline used for removing overburden that covers the lignite

2 East Miner for loading lignite onto haulers

3 Truck hopper haulers dump lignite into hopper which feeds the primary crusher Crusher breaks lignite into less than six inch pieces

4 Transfer house allows lignite to go directly to crusher-house or to active storage silos

5 Active storage silos serve as a storage area for lignite together, silo capacity is 23,000 tons

6 Rotary plows located underneath storage silos reclaim lignite for use in plant

7 Crusher house reduces lignite to pieces 1½ inches or less

8 Silos for lignite storage are located on the boiler above pulverizers which grind the lignite to the consistency of face powder before it goes to furnaces

9 Fans for blowing lignite into furnace and to supply air for combustion

10 Boiler makes high pressure steam using the heat produced from burning lignite

11 Electrostatic precipitators are used to remove fly ash coming from boiler furnace

12 Scrubbers are used to remove sulphur dioxide from combustion gases before they are dispersed by the stack

13. Stack is 525 feet tall with inside diameter of 23 feet at the top

14 Turbines are run by steam from boiler at 2,400 pounds per square inch pressure at 1,000 degrees F The turbine drives the generator

15 Condensers are used to convert steam back to water for reuse in the boilers Water from cooling lake goes through these condensers and back into the lake after condensing the steam

16 Generator speed is maintained at 3 600 revolutions per minute by means of a governor on the turbine The power is generated at 24,000 volts

17 Transformers are used to raise generator voltage from 24 000 volts to 138 000 volts

18 Transmission lines carry power at 138 000 volts to distribution substations

19 Distribution substations located in the various cities and towns reduce the transmission line voltage to distribution voltage for use in homes farms businesses and industries

FIGURE 1

- Wastewater treatment solids - from treatment of bottom ash transport system blowdown and material storage runoff

- Plant refuse disposed of in an on-site landfill

- Waste oil - the waste oil is recycled

- Other wastes stored in on-site storage ponds before final disposal in an on-site landfill

SWEPCO also generates four types of hazardous wastes. These include:

- Spent solvents from equipment cleaning - stored for les than 90 days

- Demineralizer regeneration wastewater - discharged to a chemical sump, after which it is sent to the bottom ash pond

- Laboratory wastes - discharged to a chemical sump, after which it is sent to the bottom ash pond

- Metal cleaning wastewater - stored in surface impoundment

RCRA Hazardous Waste Activity

The SWEPCO-Henry W. Pirkey Plant submitted its Notification of Hazardous Waste Activity (Document 1) on August 12, 1980. It later received interim status after filing its Part A application (Document 2) on November 12, 1980. At the time of these submittals, SWEPCO had just begun construction of the Henry W. Pinkey plant. Construction was completed in late 1984, and the plant went into production on January 3, 1985. Because the facility submitted its original Notification of Hazardous Waste Activity and Part A application during construction, much of the information included in these documents was estimated based on waste streams produced at other SWEPCO power plants. The plant did not submit an amended Notification of Hazardous Waste Activity when it began operations in 1985.

The facility handles its four types of hazardous wastes in the following manner:

- Spent solvents from equipment cleaning are drummed and stored in a designated area. The facility claims to be a small quantity generator.

- Demineralizer regeneration wastewater and laboratory wastes are discharged to a chemical sump located in the main plant area. After neutralization, the wastes are sent to the bottom ash pond system. The discharge from the pond is an outfall on SWEPCO's NPDES permit.

- Metal cleaning waste was stored in a surface impoundment for several months after plant startup. This waste was supposed to be neutralized before being added to impoundment; however, a Texas Water Commission (TWC) inspection in February 1985 (Document 7) discovered that this waste had not been neutralized. The facility is in the process of sampling the sludge and liner in this impoundment.

The facility submitted an Affidavit of Exclusion (Document 20) on March 7, 1986. This Affidavit of Exclusion included "accumulation time," "elementary neutralization unit," and "small quantity generator" exclusions. SWEPCO does not intend to submit a Part B permit application.

Other Findings

The LOIS team noted one potentially regulated hazardous waste activity which SWEPCO did not include in its Affidavit of Exclusion. The facility has not claimed an exemption for its disposal of laboratory wastes. These wastes include organic solvents and other chemicals used in analyses for its NPDES permit. SWEPCO's Part A application (Document 2) indicates that these chemicals are disposed of in a surface impoundment (SWMU No. 1 of 5). Mr. Bond and SWEPCO laboratory personnel indicated that they did not know how much laboratory waste is generated each year. The facility may not meet the exemption requirements in 40 CFR 261.3(a)(2)(iv).

EPA I.D. Number TXD 000 726 380

SUMMARY REPORT

Facility Name: Southwestern Electric Power Company - Henry W. Pirkey Plant

HAZARDOUS WASTE NOTIFICATION STATUS

				DOCUMENT
Original Submitted	/_/ No	/X/ Yes	Date 8/12/80	1
Amendment(s)	/X/ No	/_/ Yes	Date(s)	

Describe Amendments:

PART A APPLICATION STATUS

Original Submitted	/_/ No	/X/ Yes	Date 11/18/80	2
Changes	/X/ No	/_/ Yes	Date(s)	
Approved Changes During Interim Status	/_/ No	/_/ Yes	Date(s)	
	/_/ Undetermined			

Describe Changes:

LOIS CERTIFICATION *

Submitted	/X/ No	/_/ Yes	Date	
Certified Ground Water	/X/ No	/_/ Yes		
Certified Financial	/X/ No	/_/ Yes	/_/ Partial	

* The facility filed an Affidavit of Exclusion (Document 20); therefore, it did not submit a Part B permit application or certify ground-water or financial requirements.

EPA I.D. Number TXD 000 726 380

DOCUMENT

LOIS VERIFICATION

Ground-Water Monitoring System:

Waiver Approved /X/ No /_/ Yes Date _____ _____

Last CME Conducted /X/ None /_/ Yes Date/ _____ _____
Agency _____

Enforcement Action Outstanding as of November 8, 1985 /X/ No /_/ Yes /_/ Unknown Date Issued _____ _____

GWM System Adequate /_/ No /_/ Yes /X/ Unknown Judged by _____ _____

Inadequacies: _____

Financial - TWC has not requested closure or post-closure assurance

C/PC Assurance /X/ No /_/ Yes

Mechanism: _____ Amount Closure: _____
Effective Period: _____ Postclosure: _____

Sudden Liability /X/ No /_/ Yes /_/ Variance Document _____

Non-Sudden Liability /X/ No /_/ Yes /_/ Variance Document _____

Financial Adequate /_/ No /_/ Yes Judged by _____

Inadequacies: _____

Part B Application

Date of Call In 6/6/85
Date of Submittal No Submittal

NOD Sent /X/ No /_/ Yes Date(s) _____ _____

Complete /X/ No /_/ Yes Date _____

Deficiencies as of November 8, 1985: _____

EPA I.D. Number TXD 000 726 380

CLOSURE PLAN

1. Name of Unit: Metal Cleaning Surface Impoundment

Unit 1 of 1 of Section E

Submitted for Approval	/_/ No	/X/ Yes	Date	5/14/85
Approved	/_/ No	/X/ Yes *	Date	6/25/85
Implementing on Schedule?	/_/ No	/X/ Yes **		
Certified Closed by P.E.	/X/ No	/_/ Yes	Date	_____

* The closure plan (Document 10) was approved subject to additional TWC requirements (Document 12).

** Rain has delayed sampling several times. SWEPCO notified TWC of the delays (Documents 15 and 17). The facility tested the sludge and liner and is waiting for the results of permeability tests before submitting all analytical results to TWC. Brian Bond (SWEPCO) indicated that the test results showed the following approximate pH ranges:

- 3.5-3.8 - Sludge and upper 6 inches of liner
- 3.5-4.0 - 12-inch liner depth
- 3.8-4.0 - 24-inch liner depth
- 4.0-5.0 - Control samples from the liner of an adjacent surface impoundment

Figure 3 shows a schematic of the closure plan.

CLOSURE PLAN
METAL CLEANING POND
PIRKEY POWER PLANT

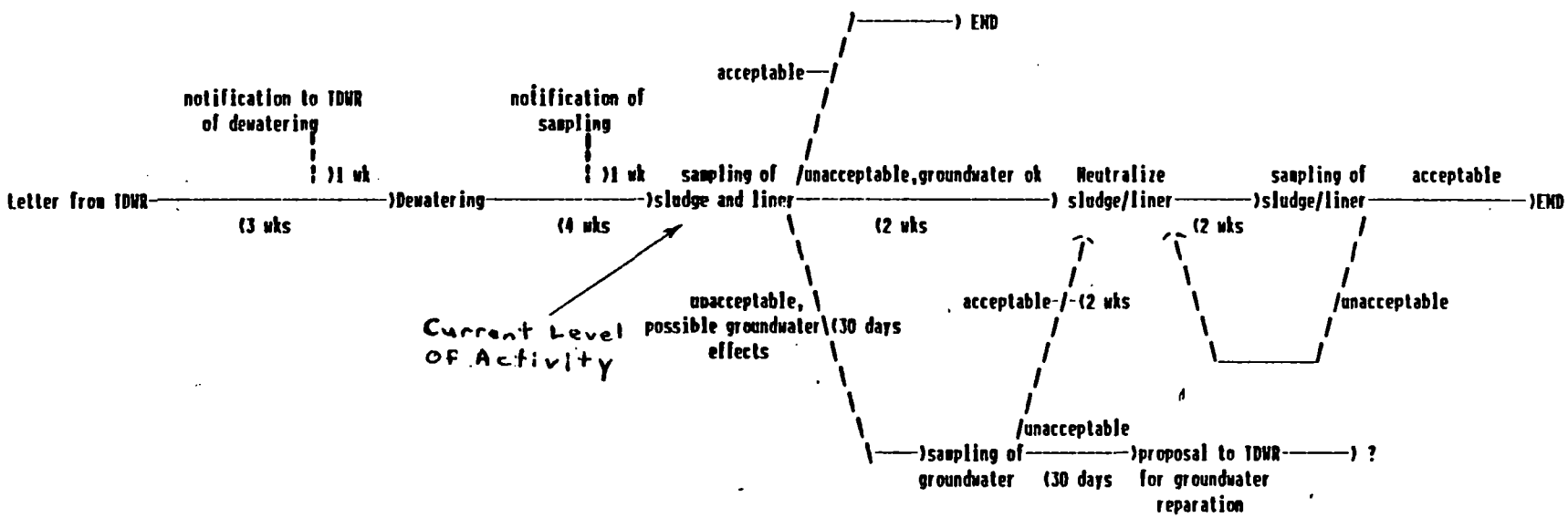


FIGURE 3

EPA I.D. Number TXD 000 726 380

RCRA ACTIVITIES AS OF NOVEMBER 8, 1985

Generator	/_/ No	/X/ Yes	Accumulation time <90 days X Container __ Tank
Transporter	/X/ No	/_/ Yes	
Storage in tanks	/X/ No	/_/ Yes	
Storage in containers	/X/ No	/_/ Yes	
Treatment Other Than Land Disposal	/X/ No		

Codes: /_/ T01 /_/ T03 /_/ T04

Comments: The facility is currently claims to be a small quantity generator. It accumulates spent solvent in drums. If the facility exceeds the small quantity limit, it will dispose of the solvent within 90 days.

EPA I.D. Number TXD 000 726 380

RCRA ACTIVITIES AS OF NOVEMBER 8, 1985
(Continued)

Land Disposal /_/ No

Codes: /_/ D80 /_/ D81 /_/ D83 /_/ T02

/_/ S03 /X/ S04 /_/ T03 /_/ T04

Comments: The facility is in the process of closing this impoundment (see page C-3).

UIC (D79) /X/ No /_/ Yes

Exemptions /_/ No /X/ Yes

Elementary Neutralization Unit	/_/ No	/X/ Yes	Units:
Recycle	/X/ No	/_/ Yes	Units:
Small Quantity Generator	/_/ No	/X/ Yes	Units:
Other Exemption	/_/ No	/_/ Yes	Units:

Comments:

EPA I.D. Number TXD 000 726 380

LIST OF DOCUMENTS

1. Title Notification of Hazardous Waste Activity

   Author John W. Turk, SWEPCO

   Date 8/12/80 Number of Pages 2

   Reviewed ____ Copied X

   Subject Relevance Original notification

2. Title Part A Permit Application

   Author John W. Turk, SWEPCO

   Date 11/18/80 Number of Pages 9

   Reviewed ____ Copied X

   Subject Relevance

3. Title Industrial Solid Waste Management Inventory

   Author Jay Pruett, SWEPCO

   Date 4/3/85 Number of Pages

   Reviewed ____ Copied X

   Subject Relevance Initial Notification

4. Title Part A Permit Application Acknowledgement

   Author Diana Dutton, U.S. EPA Region 6

   Date 7/13/81 Number of Pages 2

   Reviewed ____ Copied X

   Subject Relevance

EPA I.D. Number TXD 000 726 380

LIST OF DOCUMENTS (Continued)

5. Title Letter to: Jay Pruett, SWEPCO

Author Jay Snow, Texas Department of Water Resources (TDWR)

Date 1/28/85 Number of Pages 2

Reviewed ____ Copied X

Subject Relevance Comments regarding ground and surface water protection relating to scrubber sludge and flyash landfill.

6. Title Interoffice Memo Re: Investigation Report

Author Billy H. Boggs, TDWR

Date 3/5/85 Number of Pages 6

Reviewed ____ Copied X

Subject Relevance Describes discovery of surface impoundment containing acid waste.

7. Title Industrial Solid Waste Compliance Monitoring Inspection Report

Author Joe D. Woodward, TDWR

Date 3/5/85 Number of Pages 26

Reviewed ____ Copied X

Subject Relevance Indicates noncompliances for acid waste surface impoundments.

8. Title Hazardous Waste Compliance Monitoring and Enforcement Log

Author Joe D. Woodward, TDWR

Date 3/11/85 Number of Pages 1

Reviewed ____ Copied X

Subject Relevance

EPA I.D. Number TXD 000 726 380

LIST OF DOCUMENTS (Continued)

9. Title Telephone Memo to File

Author David Buchanan, TDWR

Date 4/17/85 Number of Pages 1

Reviewed ____ Copied X

Subject Relevance Informed Jay Pruett (SWEPCO) that the facility must submit a closure plan.

10. Title Closure Plan - Metal Cleaning Surface Impoundment

Author Jay Pruett, SWECO

Date 5/14/85 Number of Pages 3

Reviewed ____ Copied X

Subject Relevance Submitted to TDWR.

11. Title Part B Call In

Author Jay Snow, TDWR

Date 6/6/85 Number of Pages 5

Reviewed ____ Copied X

Subject Relevance

12. Title Letter to: Jay Pruett

Author Bryan W. Dixon, TDWR

Date 6/25/85 Number of Pages 3

Reviewed ____ Copied X

Subject Relevance Comments regarding closure of metal cleaning surface impoundment

EPA I.D. Number TXD 000 726 380

LIST OF DOCUMENTS (Continued)

13. Title Memorandum of Telephone Conversation

Author Jay Pruett, SWEPCO

Date 6/28/85 Number of Pages 1

Reviewed ____ Copied X

Subject Relevance Notified TDWR that SWEPCO will begin dewatering the metal cleaning surface impoundment on 7/5/85

14. Title Letter to: Joe D. Woodward, Texas Water Commission (TWC)

Author Jay Pruett, SWEPCO

Date 6/28/85 Number of Pages 1

Reviewed ____ Copied X

Subject Relevance Provides written notification of intent to begin closure.

15. Title Memorandum of Telephone Conversation

Author Brian Bond, SWEPCO

Date 11/1/85 Number of Pages 1

Reviewed ____ Copied X

Subject Relevance Postponement of sludge sampling until the impoundment is dewatered again.

16. Title Letter to: Jay Pruett, SWEPCO

Author Minor Brooks Hibbs, TWC

Date 11/15/85 Number of Pages 1

Reviewed ____ Copied X

Subject Relevance Notified SWEPCO that it lost its interim status and must submit closure plans for all land disposal units.

EPA I.D. Number TXD 000 726 380

LIST OF DOCUMENTS (Continued)

17. Title Memorandum of Telephone Conversation

Author Brian Bond, SWEPCO

Date 12/2/85 Number of Pages 1

Reviewed ____ Copied X

Subject Relevance Postponed sampling of surface impoundment. The impoundment must be dewatered again.

18. Title Solid Waste Inspection Report

Author Kevin Phillips, TWC

Date 3/10/86 Number of Pages 35

Reviewed ____ Copied X

Subject Relevance Includes list of noncompliances

19. Title Notice of Registration

Author TWC

Date 3/5/86 Number of Pages 3

Reviewed ____ Copied X

Subject Relevance

20. Title Affidavit of Exclusion

Author Leslie E. Dillahunty

Date 3/7/86 Number of Pages 2

Reviewed ____ Copied X

Subject Relevance Indicates "Accumulation Time," "Small Quantity Generator," and "Elementary Neutralization Unit" exclusions.

EPA I.D. Number TXD 000 726 380

LIST OF DOCUMENTS (Continued)

21. Title Memorandum of Telephone Conversation

Author Jay Pruett, SWEPCO

Date 4/10/86 Number of Pages 1

Reviewed ____ Copied X

Subject Relevance SWEPCO disposed of grease-contaminated soil into its landfill. TWC agreed to this method of disposal.

22. Title Letter to : John Witherspoon, TWC

Author Jay Pruett, SWEPCO

Date 4/11/86 Number of Pages 3

Reviewed ____ Copied X

Subject Relevance SWEPCO cleaned up an unregistered container storage area discovered in 3/10/86 inspection. Includes EP Toxicity results. None of the containers held hazardous waste.

23. Title Letter to: Cesar Farias, TDWR

Author Jay Worley

Date 5/17/85 Number of Pages 2

Reviewed ____ Copied X

Subject Relevance At one time, SWEPCO attempted to mix Varsol with waste oil (on a test basis) to see if the resulting mixture was ignitable. However, this treatment system did not work.

EPA I.D. Number TXD 000 726 380

USE SEPARATE SHEET FOR EACH UNIT

HAZARDOUS WASTE LAND DISPOSAL UNIT DESCRIPTION

Unit No. 1 of 1

1. Facilities Name of Unit: Metal Cleaning Surface Impoundment (Active)

2. Purpose/Mode of Operation: Stored acid waste used to clean boilers during plant startup.

3. Process Code: S04

4. Design Capacity: The impoundment is used once every 3 to 5 years.

   (Cite Verification) SWEPCO personnel
   Volume 13.35 ac-ft (about 4,350,000 gallons)
   Rate Not applicable
   Depth of unit Approx. 5.5 ft average depth (volume = 13.35 ac-ft, surface area = 2.4 ac)
   Depth to ground water 40-47 ft*

5. Date of Existence: 1984

   (Cite Verification) Construction of the plant was completed in 1984

6. Dates of Last Hazardous and/or Nonhazardous Waste Addition: December 1984

   (Cite Verification) The facility added acid waste to the impoundment only once.

7. Closure Plan Submittal Date: 5/14/85 (Document 10)

8. Hazardous Waste Code(s) Handled: D002

   (Cite Verification) Describe: During an inspection, TWC discovered that the waste in the impoundment was never neutralized. The pH of the waste was 1.53, which made it hazardous due to corrosivity.

* Values are from ground-water monitoring wells located throughout the facility.

EPA I.D. Number TXD 000 726 380

Unit No. 1 of 1

9. Non-hazardous Waste Handled: None

10. Provide Narrative of History of Operation Since 11-19-80; Cite References:

SWEPCO began construction of the surface impoundment on 3/30/83 and ended construction on 11/4/84. The purpose of this surface impoundment is to store neutralized metal cleaning wastewater prior to treatment and discharge through an NPDES outfall. However, the waste was not neutralized, and TWC required closure of the unit (Document 9). SWECO is currently in the process of closing the impoundment.

11. Field Observations: The surface impoundment has approximately 6 inches of standing water in it. The LOIS team did not note any unusual conditions at the impoundment.

EPA I.D. Number TXD 000 726 380

USE SEPARATE SHEET FOR EACH UNIT

SWMU DESCRIPTION

Unit No. 1 of 5

1. Name of Unit: Chemical Sump/Neutralization System

2. Purpose/Associated Processes: Receives demineralizer regeneration wastewater (both acid and caustic) and laboratory wastes. The demineralizer regeneration wastes neutralize each other. The resulting waste is discharged to the bottom ash ponds.

3. Type/Amount of Waste Received: Demineralizer regeneration wastes and laboratory wastes are generated on a periodic basis.

4. Field Observation: The chemical sump is an underground sump located in the main plant area. The sump has a synthetic liner. Wastes are continuously neutralized and sent to the bottom ash ponds. The facility indicated that a letter from Mr. Gary Dietrick, U.S. EPA-HQ to the power industry stated that that this method of treatment is exempt from RCRA under 40 CFR 261.4(b)(4). However, the facility could not produce a copy of this letter upon request by the LOIS inspection team.

EPA I.D. Number TXD 000 726 380

USE SEPARATE SHEET FOR EACH UNIT

SWMU DESCRIPTION

Unit No. 2 of 5

1. Name of Unit: Ash Ponds (Active)

2. Purpose/Associated Processes: Three ponds are used to store flyash, bottom ash, and scrubber sludge prior to disposal at an on-site landfill.

3. Type/Amount of Waste Received: Bottom Ash Pond No. 1 is 31.5 acres. Bottom Ash Pond No. 2 is 30.85 acres. The Secondary Pond is 2.65 acres.

4. Field Observation: The LOIS team did not observe any unusual conditions.

EPA I.D. Number TXD 000 726 380

USE SEPARATE SHEET FOR EACH UNIT

SWMU DESCRIPTION

Unit No. 3 of 5

1. Name of Unit: Drum Storage Area (Active)

2. Purpose/Associated Processes: Stores waste lubricating oil and Varsol (spent solvent) prior to recycling. Spent solvent is generated during equipment cleaning.

3. Type/Amount of Waste Received: 5,000 gal/year waste oil; one 55-gal drum of Varsol since plant startup (approximately 20 months).

4. Field Observation: The drum storage area is a metal-roofed area which also stores fresh Varsol. The use of Varsol is being phased out; the facility will use Safety-Kleen in the future. The LOIS team did not note any spill areas. At the time of the inspection, the storage area held 25 drums of waste oil and one drum of spent Varsol.

EPA I.D. Number TXD 000 726 380

USE SEPARATE SHEET FOR EACH UNIT

SWMU DESCRIPTION

Unit No. 4 of 5

1. Name of Unit: Scrubber Sludge Landfill (Active)

2. Purpose/Associated Processes: Disposal of the following wastes:

   - o Fly ash
   - o Scrubber sludge
   - o Bottom ash
   - o Wastewater treatment solids

3. Type/Amount of Waste Received: The capacity of the landfill is 13,000,000 cubic yards.

4. Field Observation: The facility received a Notice of Deficiency (Document 5) from TDWR on 1/28/85. The deficiencies noted related to ground- and surface water protection. The facility does not dispose of hazardous waste in this landfill.

EPA I.D. Number TXD 000 726 380

USE SEPARATE SHEET FOR EACH UNIT

SWMU DESCRIPTION

Unit No. 5 of 5

1. Name of Unit: Sanitary Landfills (one active, one inactive)

2. Purpose/Associated Processes: SWEPCO disposes of general plant refuse in the active landfill. The plant closed the original landfill to stop illegal dumping of garbage by local residents.

3. Type/Amount of Waste Received: Varied amounts of general plant refuse. The landfill cells are approximately 15 ft by 60 ft.

4. Field Observation: The current landfill is a deep (approximately 15 ft) narrow cell into which plant personnel periodically dump office trash and other plant refuse. The plant does not apply a cover; however, the LOIS team did not observe putrescible matter or objectionable odors. The inactive landfill is filled in and has a grass cover.

NO FILE

Please print or type with ELITE type (12 ch... ers per inch) in the unshaded areas only

GSA No. 0246 EPA 07

United States Environmental Protection Agency
Washington, DC 20460

EPA Notification of Hazardous Waste Activity

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law *(Section 3010 of the Resource Conservation and Recovery Act)*.

For Official Use Only

Comments: NS1029-86

Installation's EPA ID Number	Approved	Date Received (yr. mo. day)
C F TXD000726380 T/A C 1		801118

I. Name of Installation

HENRY W. PIRKEY POWER PLANT

II. Installation Mailing Address

Street or P.O. Box: C 3 PO BOX 21106

City or Town: C 4 SHREVEPORT — State: LA — ZIP Code: 71156

III. Location of Installation

Street or Route Number: C 5 RT 2, BOX 165

City or Town: C 6 HALLSVILLE — State: TX — ZIP Code: 75650

IV. Installation Contact

Name and Title *(last, first, and job title)*: C 2 PRUETT JAY ENV. MGR.

Phone Number *(area code and number)*: 318 221 2604

V. Ownership

A. Name of Installation's Legal Owner: C R SOUTHWESTERN ELECTRIC

B. Type of Ownership *(enter code)*: M

VI. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to instructions.)*

A. Hazardous Waste Activity

- [X] 1a. Generator
- [XX] 1b. Less than 1,000 kg/mo.
- [ ] 2. Transporter
- [ ] 3. Treater/Storer/Disposer — removed per aff. of Ex 10/15/86
- [ ] 4. Underground Injection
- [ ] 5. Market or Burn Hazardous Waste Fuel *(enter 'X' and mark appropriate boxes below)*
  - [ ] a. Generator Marketing to Burner
  - [ ] b. Other Marketer
  - [ ] c. Burner

B. Used Oil Fuel Activities

- [ ] 6. Off-Specification Used Oil Fuel *(enter 'X' and mark appropriate boxes below)*
  - [ ] a. Generator Marketing to Burner
  - [ ] b. Other Marketer
  - [ ] c. Burner
- [ ] 7. Specification Used Oil Fuel Marketer *(or On site Burner)* Who First Claims the Oil Meets the Specification

SEP 25 1986

VII. Waste Fuel Burning: Type of Combustion Device *(enter 'X' in all appropriate boxes to indicate type of combustion device(s) in which hazardous waste fuel or off-specification used oil fuel is burned. See instructions for definitions of combustion devices.)*

- [ ] A. Utility Boiler
- [ ] B. Industrial Boiler
- [ ] C. Industrial Furnace

VIII. Mode of Transportation *(transporters only — enter 'X' in the appropriate box(es)*

- [ ] A. Air
- [ ] B. Rail
- [ ] C. Highway
- [ ] D. Water
- [ ] E. Other *(specify)*

IX. First or Subsequent Notification

Mark 'X' in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your installation's EPA ID Number in the space provided below.

- [ ] A. First Notification
- [XX] B. Subsequent Notification *(complete item C)*

C. Installation's EPA ID Number: TXD000726380

EPA Form 8700-12 (Rev. 11-85) Previous edition is obsolete.

Continue on reverse

Please print or type in the unshaded a only
(fill-in areas are spaced for elite type, i.e., 12 ch rs/inch).

33240 Key #

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F T X D 0 0 0 7 2 6 3 8 0 3 D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)	X		
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)	X		NO	J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP HENRY W. PIRKEY POWER PLANT

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 PRUETT JAY A. MGR OF ENV. AFF	318 221 2604

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 PO BOX 21106

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 SHREVEPORT	LA	71156

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 PO BOX 33

B. COUNTY NAME

HARRISON

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 HALLSVILLE	TX	75650	

NOV 19 1980

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	B. SECOND
7 4911 *(specify)* Electric Power Services	7 *(specify)*
C. THIRD	**D. FOURTH**
7 *(specify)*	7 *(specify)*

VIII. OPERATOR INFORMATION

A. NAME: 8 SOUTHWESTERN ELECTRIC POWER COMPANY

B. Is the name listed in Item VIII-A also the owner? [X] YES [ ] NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*
F = FEDERAL, S = STATE, P = PRIVATE, M = PUBLIC *(other than federal or state)*, O = OTHER *(specify)*: P *(specify)*

D. PHONE *(area code & no.)*: A 318 222 2141

E. STREET OR P.O. BOX: P. O. BOX 21106

F. CITY OR TOWN	G. STATE	H. ZIP CODE
B SHREVEPORT	LA	71156

IX. INDIAN LAND
Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	D. PSD *(Air Emissions from Proposed Sources)*
9 N	9 P PSD-TX-64
B. UIC *(Underground Injection of Fluids)*	**E. OTHER** *(specify)*
9 U	9 S C-6269 *(specify)* TACB Construction Permit-state
C. RCRA *(Hazardous Wastes)*	**E. OTHER** *(specify)*
9 R	9 *(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

F9: A/50

XII. NATURE OF BUSINESS *(provide a brief description)*

Electric Power Generation

F9: A/51

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
John W. Turk, Jr., Vice President, Superintendent of Power	John W. Turk	11/18/80

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (6-80) REVERSE

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

S												T/A	C
F	T	X	D	0	0	0	7	2	6	3	8	0	3 1

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS
A	8 0 1 1 1 9	

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

C 8 — YR. 7 9 — MO. 0 4 — DAY 0 5

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

[ ] 2. NEW FACILITY *(Complete item below.)*

YR. — MO. — DAY

FOR NEW FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

S		T/A	C
C	DUP		1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
~~X-1~~	~~S 0 2~~	~~600~~	~~G~~		5	T 0 1	3,600,000.000	U	
~~X-2~~	~~T 0 3~~	~~20~~	~~E~~		6				
1	S 0 4	1,000,000.000	G		7				
2	D 8 3	1,000,000.000	G		8				
3	T 0 2	1,000,000.000	U		9				
4	T 0 4	5,000.000	U		10				

Continued from the front.

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

Line	A	B-1	B-2	Description
4	T04	5,000	gal/day	Package Sewage Treatment Plant

IV. DESCRIPTION OF HAZARDOUS WASTES

A. **EPA HAZARDOUS WASTE NUMBER** — Enter the four—digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four—digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. **ESTIMATED ANNUAL QUANTITY** — For each **listed waste** entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each **characteristic** or **toxic contaminant** entered in column A estimate the total annual quantity of all the non—listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. **UNIT OF MEASURE** — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. **PROCESSES**

1. PROCESS CODES:
   For listed hazardous waste: For each **listed** hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate **all** the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
~~X-1~~	~~K054~~	~~900~~	~~P~~	~~T03 D80~~	
~~X-2~~	~~D002~~	~~400~~	~~P~~	~~T03 D80~~	
~~X-3~~	~~D001~~	~~100~~	~~P~~	~~T03 D80~~	
~~X-4~~	~~D002~~				*included with above*

 CONTINUE ON PAGE 3

Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
W T X D 0 0 0 7 2 6 3 8 0 T/A C 1	W DUP T/A C 2 DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
20-22 A01	D002	3,600.000 ~~see attachment~~	T	S04 D83 T02 T01	T04
A01	U219				Included with above
3	D001	5000.000	P	S04 D83 T02 T01	
4	U210	500.000	P	S04 D83 T02 T01	
5	U013	100.000	P	S04 D83 T02	
6	U044	20.000	P	T04	
7	U002	30.000 ~~90~~	P	T04	
8	U220	100.000 ~~100~~	P	S04 D83 T02 T04	T01
9	U154	100.000 ~~100~~	P	S04 D83 T02 T04	T01
10	F002	40.000 ~~40~~	P	S04 D83 T02 T04	T01
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

Line No.	Process Codes - Additional
1	T04
8	T01
9	T01
10	T01

EPA I.D. NO. *(enter from page 1)*

F T X D 0 0 0 7 2 6 3 8 0 T/A 3 C 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
32 27 45	094 28 58

VIII. FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F	G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
John W. Turk, Jr. Vice President, Sup't. of Power	John W. Turk	11/16/80

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED

CONTINUE ON PAGE 5

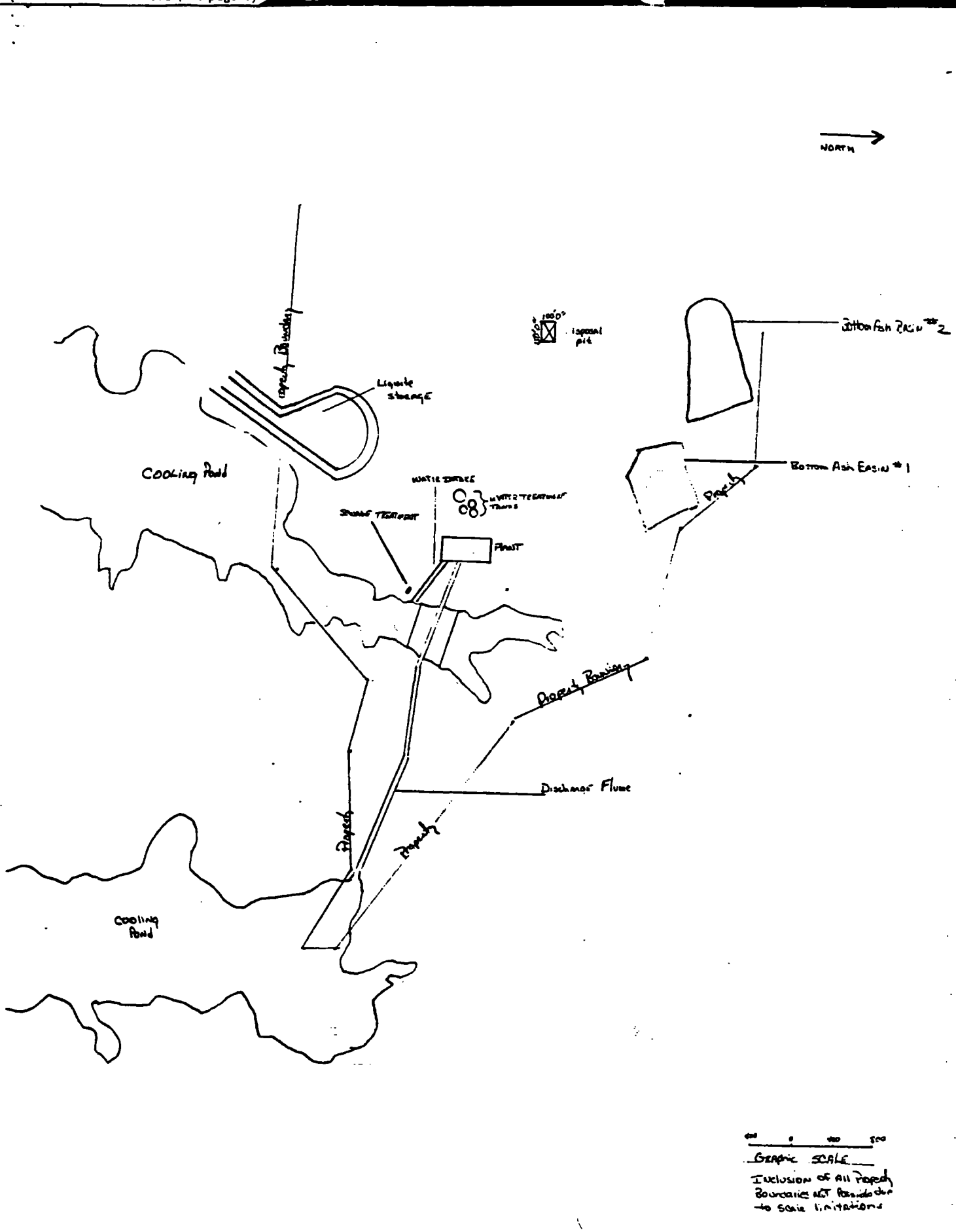
Pirkey Power Plant
TXD000726380

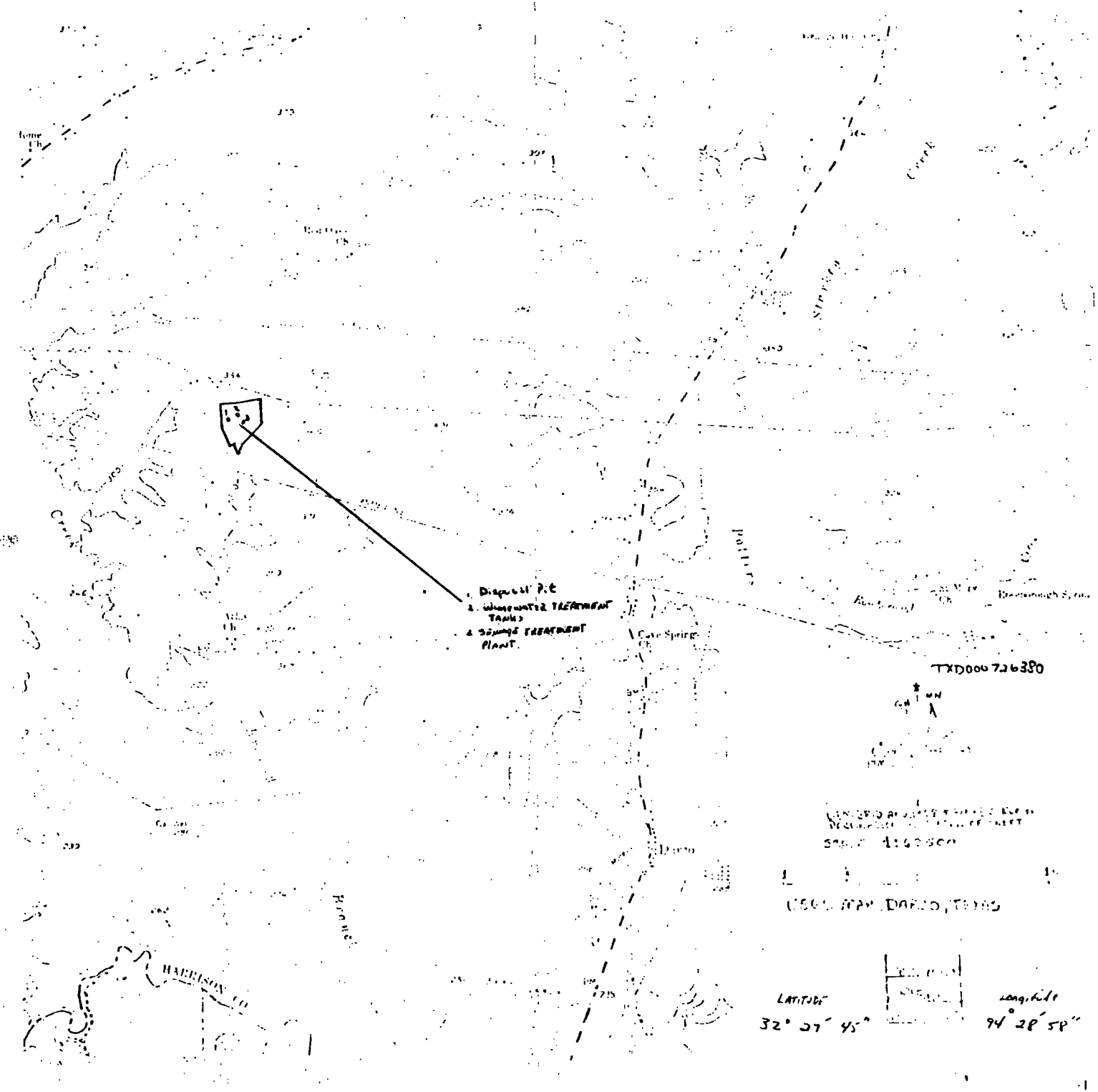
IV

14. D002 This major waste with this characteristic is generated, treated, stored, and/or disposed of once every 3 to 5 years for each of the generating unit boilers at this site. When this occurs, the annual quantity of waste is up to 3,600 tons. In other years, the quantity may be less than 100 pounds.

Continued from page 4.

V. FACILITY DRAWING *(see page 4)*





1. Disposal Pit
2. Wastewater Treatment Tanks
3. Sewage Treatment Plant.
Cave Spring
Darco
HARRISON CO
Creek
Potters
TXD000726380
LATITUDE
32° 27' 45"
Longitude
94° 28' 58"

6380

3

TEXAS DEPARTMENT OF WATER RESOURCES

INDUSTRIAL SOLID WASTE MANAGEMENT INVENTORY
Initial Notification

RETURN TO:
TEXAS DEPARTMENT OF WATER RESOURCES
SOLID WASTE SECTION
P.O. BOX 13087, CAPITOL STATION
AUSTIN, TEXAS 78711

PLEASE RETURN WITHIN 30 DAYS

PART I. INTRODUCTION

The Texas Solid Waste Disposal Act authorizes the Texas Department of Water Resources (TDWR) to regulate all industrial solid waste activities in Texas. This form should be completed and returned to the address given above. Please complete all applicable pages and sign on page 9.

THIS FORM IS FOR INITIAL NOTIFICATION ONLY

For changes and additions to existing registrations, please use the registration update form.

1. Does your firm generate Industrial Solid Waste(s) as defined below?

   ☒ Yes ☐ No

   "Industrial solid waste" means any solid waste resulting from or incidental to any process of industry or manufacturing, mining or agricultural operations.

   "Solid waste" means any garbage, rubbish, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations, and from community and institutional activities, but does not include: (i) solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows, or industrial discharges subject to regulation by permit issued pursuant to Chapter 26, Water Code; (ii) soil, dirt, rock, sand and other natural or man-made inert solid materials used to fill land if the object of the fill is to make the land suitable for the construction of surface improvements, or (iii) waste materials which result from activities associated with the exploration, development, or production of oil or gas and are subject to control by the Texas Railroad Commission.

2. Describe the nature of your business, including the products manufactured and services rendered at the facility.

   Electric Power Generation

PART II. GENERAL INFORMATION

Please provide the information requested in the boxes below.

Office Use Only
3 3 2 4 0
Registration No.

T X D 0 0 0 7 2 6 3 8 0
7 18
U.S. EPA I.D. Number

All firms that transport, generate, treat, store or dispose of hazardous waste (except small quantity generators) must have an EPA I.D. number.

SW ELECTRIC POWER CO., H. W. PIRKEY 33240
HALLSVILLE, TEXAS

Part II. General Information—Continued

OFFICE USE ONLY

33240

Line Action

01 A (20–23)

SOUTHWESTERN ELECTRIC POWER CO (27–56)
Company Name

MPANY (58–87)
Company Name Continued (if needed)

PO BOX 21106 (89–118)
Mailing Address

02 A (20–23)

SHREVEPORT (27–46) LA (48) 71156 (51–59)
City State Zip Code

MR JAY A PRUETT (65–82) 3182212604 (84–93)
Person to Contact Telephone
Regarding Solid Waste Management

+ (62)
Employee Group

"—" = less than 100 employees
"+" = greater than or equal to 100 employees

Enter "—" or enter "+"

03 A (20–23)

H. W. PIRKEY POWER PLANT HALLSVILLE (63)
Site Location

TEXAS (87–100)
Site Location—Continued

05 (33) District

102 (49) County (see Table 1, p. 10)

REPORTING REQUIREMENTS EFFECTIVE DATE

A0885 M0885

OFFICE USE ONLY

Region Basin

Enter the appropriate codes for the location of your generating site.

STANDARD INDUSTRIAL CLASSIFICATION CODES (SIC)

05 A (23)

01 02 03 04 05 06 07
4911 (26–56)

08 09 10 11 12 13 14
(61–91)

These code classify your establishment by the type of industrial or manufacturing activity you are engaged in. Refer to the Standard Industrial Classification Manual prepared by the Office of Management and Budget (U.S. Government Printing Office) if you do not know the appropriate SIC codes for your company.

3 3 2 4 0

The following questions refer to transportation of industrial solid waste.

Do you transport Class I or hazardous industrial solid waste in the State of Texas?

☐ Yes ☒ No

If "no" skip to the Section below entitled REGISTRATION TYPE.

Enter the letter corresponding to the method of transport in box number 31.

0	4		A		
20			23		31

H-highway; R-rail; P-pipeline; W-water

What type of wastes do you transport (e.g. spent acids, metal plating sludge, etc.)?

Do you operate a transfer facility as described in 31 TAC 335.94? ☐ Yes ☐ No
If "yes" complete page 7 except for which wastes are treated, stored or disposed.

Carrier classification: Check all applicable categories.

☐ Private ☐ For hire ☐ Interstate ☐ Intrastate Foreign: ☐ In ☐ Out

REGISTRATION TYPE

0	4		A		G
20			23		27

This question refers to all industrial solid waste, both hazardous and non-hazardous. Enter the letter of the most appropriate category from the list below in box number 27 to the left.

Code	Description
G	*generator*—any person, by site, who produces industrial solid waste; any person who possesses industrial solid waste to be shipped to any other person; or any person whose act first causes a solid waste to become subject to regulation.
R	*receiver*—persons who accept industrial solid waste from an off-site source. PLEASE NOTE—Receipt of industrial solid waste from an off-site source is an activity that requires a permit from the Texas Department of Water Resources pursuant to 31 TAC Section 335.2.
T	*transporter*—any person who conveys or transports industrial solid waste by truck, ship, pipeline, or other means.
A	*generator/transporter*—persons who are both generators and transporters of industrial solid waste.
B	*receiver/transporter*—persons who are both receivers and transporters of industrial solid waste.
D	*generator/receiver/transporter*—persons who are generators, receivers and transporters of industrial solid waste.

0 4 A	0 8 3 0 8 5	D K B
0 3 A	A	OFFICE USE ONLY
0 2 A		

33240

HAZARDOUS WASTE STATUS

This question refers to hazardous waste as defined in 40 CFR 261. (Copies of these regulations are available through TDWR offices.) Leave this question blank if you do *not* generate, treat, store or dispose of hazardous waste *and* never obtained an EPA I.D. number. Enter the number or letter of the most applicable category from the list below in box number 30.

Line Action

0	3		A		3
20			23		30

1 ***generator***—any person, by site, who produces hazardous industrial solid waste; any person who possesses hazardous industrial solid waste to be shipped to any other person; or any person whose act first causes a hazardous industrial solid waste to become subject to regulation under 31 TAC Chapter 335.

2 ***non-handler***—persons who do not generate hazardous waste but have obtained an EPA I.D. Number.

3 ***small quantity generator***-persons who qualify as a small quantity hazardous waste generator as defined in 31 TAC Section 335.61.

4 ***generator/TSD facility***—persons who generate and also treat, store or dispose of hazardous waste (see #1 and #8).

5 ***generator/transporter***—persons who produce hazardous waste and also transport hazardous waste (see #1 and #7).

6 ***generator/transporter/TSD facility***—persons who generate, transport and treat, store or dispose of hazardous waste (see #1, #7, and #8).

7 ***transporter***—any person who conveys or transports hazardous industrial solid waste by truck, ship, pipeline, or other means.

8 ***TSD facility***—persons engaged in treatment, storage, and/or disposal of hazardous waste unless excluded from permit requirements by reasons defined in 31 TAC Section 335.2 (d), (e) and (f), 31 TAC 335.69 and 335.94. Treatment is defined as the extraction of materials, transfer, volume reduction, conversion to energy, or other separation and preparation of hazardous industrial solid waste for reuse or disposal, including the treatment or neutralization of hazardous waste, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material from the waste or so as to render such waste non-hazardous, or less hazardous; safer to transport, store or dispose of; or amenable for recovery, amenable for storage, or reduced in volume. Storage means the holding of solid waste for a temporary period, at the end of which the waste is processed, disposed of, or stored elsewhere. Disposal facility means a facility at which hazardous waste is intentionally placed into or on any land or water, and at which waste will remain after closure. PLEASE NOTE—TSD facilities must be authorized by permit from the Texas Department of Water Resources pursuant to 31 TAC Section 335.42.

9 ***small quantity generator/transporter***—small quantity generators who also transport hazardous waste (see #3 and #7).

B ***transporter/TSD facility***—transporters of hazardous waste who also treat, store and dispose of hazardous waste (see #7 and #8).

C ***closed***—a facility which has closed in accordance with approved facility closure plans and all applicable requirements.

D ***TSD facility/small quantity generator***—persons who are small quantity generators and also treat, store or dispose of hazardous wastes (see #8 and #3).

Office Use Only

3 3 2 4 0

PART III. WASTE CHARACTERISTICS AND HANDLING PRACTICES

Complete this page for each waste you generate. Space is provided on this form for two wastes. Copy this form as needed if you generate more than two wastes.

Line Action: 3 1 A (20–23)

Sequence Number: Waste No. 0 0 1 of 004 (27)

Number each waste sequentially starting with 001, 002, etc. and enter this number under Sequence Number. See page 9 for further explanation of sequence numbers.

1 1 0 4 9 0 Office Use Only 1 2 0

Verbal description of the waste: waste oil which are lubricating oils from plant gear boxes and vehicles.

Describe the process from which the waste is generated: The waste oil is generated from the process of draining dirty oil from automotive equipment and plant gear boxes.

Waste components—chemical compositions and amount (in % or mg/l) of each: various lubricating oils

☐ If this waste is hazardous, place an "X" in the box and list applicable hazardous waste number(s) as found in 40 CFR Part 261, *Identification and Listing of Hazardous Waste.* **Please note that it is the responsibility of the generator to determine if waste is hazardous (31 TAC 335.62). The definition of hazardous waste is in 40 CFR Part 261.3.**

3 1 A (20–23) (42) (49) (56) (63) (70) (77) (84)

Physical state (check one): ☐ solid ☒ liquid; ☐ semi solid or sludge; _____ % solids

Toxicity information (if available): Not available

☐ ignitability ☐ corrosivity ☐ odor ☐ other

Waste Handling Practices — Check all categories that describe how this waste is handled. For example, if this waste is temporarily stored on-site then sent off-site for disposal check both on-site and off-site.

☒ *on-site*—For *hazardous* waste, on-site storage, processing, or disposal is defined in 31 TAC 335.42. For *non-hazardous* waste, on-site is defined in 31 TAC 335.1. *Complete the Facility Information sheet (p. 7) if you check this box.*

☒ *off-site*—Any storage, treatment or disposal of waste which is not characterized as on-site.

☐ *sanitary sewer*—Waste is sent to a publicly-owned treatment work.

☐ *off-site via pipeline*—Waste is piped off the generation site property by pipeline.

☐ *other*—Describe any handling of your waste not described by the above categories _____

Office Use Only: 3 3 2 4 0

PART III. WASTE CHARACTERISTICS AND HANDLING PRACTICES

Complete this page for each waste you generate. Space is provided on this form for two wastes. Copy this form as needed if you generate more than two wastes.

Line Action: 3 1 A (20–23)

Sequence Number: Waste No. 0 0 2 (27) of 004

Number each waste sequentially starting with 001, 002, etc. and enter this number under Sequence Number. See page 9 for further explanation of sequence numbers.

9 1 0 1 0 0 OFFICE USE ONLY 1 2 0

Verbal description of the waste: waste solvent from cleaning of equipment

Describe the process from which the waste is generated: Equipment cleaning

Waste components—chemical compositions and amount (in % or mg/l) of each: Varsol (mineral Spirits)

[X] If this waste is hazardous, place an "X" in the box and list applicable hazardous waste number(s) as found in 40 CFR Part 261, *Identification and Listing of Hazardous Waste.* **Please note that it is the responsibility of the generator to determine if waste is hazardous (31 TAC 335.62). The definition of hazardous waste is in 40 CFR Part 261.3.**

3 1 A (20–23) D 0 0 1 (42–49, 56, 63, 70, 77, 84)

Physical state (check one) [ ] solid [X] liquid; [ ] semi solid or sludge; _____ % solids

Toxicity information (if available): Not Available

[X] ignitability [ ] corrosivity [ ] odor [ ] other

Waste Handling Practices — Check all categories that describe how this waste is handled. For example, if this waste is temporarily stored on-site then sent off-site for disposal check both on-site and off-site.

[X] *on-site*—For *hazardous* waste, on-site storage, processing, or disposal is defined in 31 TAC 335.42. For *non-hazardous* waste, on-site is defined in 31 TAC 335.1. *Complete the Facility Information sheet (p. 7) if you check this box.*

[X] *off-site*—Any storage, treatment or disposal of waste which is not characterized as on-site.

[ ] *sanitary sewer*—Waste is sent to a publicly-owned treatment work.

[ ] *off-site via pipeline*—Waste is piped off the generation site property by pipeline.

[ ] *other*—Describe any handling of your waste not described by the above categories _____

Office Use Only
Registration Number
3 3 2 4 0

PART III. WASTE CHARACTERISTICS AND HANDLING PRACTICES - CONTINUED

Complete this page for each waste you generate. Space is provided on this form for two wastes. Copy this form as needed if you generate more than two wastes.

Line Action: 3 1 [redacted] A (20–23)

Sequence Number — Waste No. 0 0 3 of 004 (27)

Number each waste sequentially starting with 001, 002, etc. and enter this number under Sequence Number. See page 9 for further explanation of sequence numbers.

2 7 9 7 6 0 — OFFICE USE ONLY — 1 8 0 (31)

Verbal description of the waste: Plant Refuse

Describe the process from which the waste is generated: Refuse operated through power plant operation

Waste components—chemical compositions and amount (in % or mg/l) of each: Refuse generated will include but will not be limited to wood, paper, small metal items and other miscellaneous materials. There will be no liquid materials or EPA designated hazardous waste material.

☐ If this waste is hazardous, place an "X" in the box and list applicable hazardous waste number(s) as found in 40 CFR Part 261, *Identification and Listing of Hazardous Waste*. Please note that it is the responsibility of the generator to determine if waste is hazardous (31 TAC 335.62). The definition of hazardous waste is in 40 CFR Part 261.3.

3 1 [redacted] A (20–23) | 42 | 49 | 56 | 63 | 70 | 77 | 84

Physical state (check one): ☒ solid ☐ liquid; ☐ semi solid or sludge: _____ % solids

Toxicity information (if available): Not Available

☐ ignitability ☐ corrosivity ☐ odor ☐ other

Waste Handling Practices — Check all categories that describe how this waste is handled. For example, if this waste is temporarily stored on-site then sent off-site for disposal check both on-site and off-site.

☒ *on-site*—For *hazardous* waste, on-site storage, processing, or disposal is defined in 31 TAC 335.42. For *non-hazardous* waste, on-site is defined in 31 TAC 335.1. *Complete the Facility Information sheet (p. 7) if you check this box.*

☐ *off-site*—Any storage, treatment or disposal of waste which is not characterized as on-site.

☐ *sanitary sewer*—Waste is sent to a publicly-owned treatment work.

☐ *off-site via pipeline*—Waste is piped off the generation site property by pipeline.

☐ *other*—Describe any handling of your waste not described by the above categories _____

33240

PART III. WASTE CHARACTERISTICS AND HANDLING PRACTICES - CONTINUED

Complete this page for each waste you generate. Space is provided on this form for two wastes. Copy this form as needed if you generate more than two wastes.

Line Action: 3 1 A (20–23)

Sequence Number: Waste No. 0 0 4 of 004 (27)

Number each waste sequentially starting with 001, 002, etc. and enter this number under Sequence Number. See page 9 for further explanation of sequence numbers.

see Attachment A. gm

171380 100

Verbal description of the waste: Fly ash/Flue gas Desulfurization sludge/wastewater treatment solids/bottom ash

Describe the process from which the waste is generated: See Attachment A

Waste components—chemical compositions and amount (in % or mg/l) of each: See Attachment B

☐ If this waste is hazardous, place an "X" in the box and list applicable hazardous waste number(s) as found in 40 CFR Part 261, *Identification and Listing of Hazardous Waste.* **Please note that it is the responsibility of the generator to determine if waste is hazardous (31 TAC 335.62). The definition of hazardous waste is in 40 CFR Part 261.3.**

3 1 A (20–23) (42 49 56 63 70 77 84)

Physical state (check one): ☐ solid ☐ liquid; ☒ semi solid or sludge; >75 % solids

Toxicity information (if available): Not available

☐ ignitability ☐ corrosivity ☐ odor ☐ other

Waste Handling Practices — Check all categories that describe how this waste is handled. For example, if this waste is temporarily stored on-site then sent off-site for disposal check both on-site and off-site.

☒ *on-site*—For *hazardous* waste, on-site storage, processing, or disposal is defined in 31 TAC 335.42. For *non-hazardous* waste, on-site is defined in 31 TAC 335.1. *Complete the Facility Information sheet (p. 7) if you check this box.*

☐ *off-site*—Any storage, treatment or disposal of waste which is not characterized as on-site.

☐ *sanitary sewer*—Waste is sent to a publicly-owned treatment work.

☐ *off-site via pipeline*—Waste is piped off the generation site property by pipeline.

☐ *other*—Describe any handling of your waste not described by the above categories

PART IV. ON-SITE WASTE MANAGEMENT FACILITY CHARACTERISTICS

Complete this page if you checked "on-site" in Part III. Complete this sheet for each on-site facility. Copy this form as needed if you have more than two facilities. Refer to the attached tables for the proper codes to use when completing this page.

Sequence Number

Facility No. 0 1 of 03 (total no. of facilities)

7

Number each facility sequentially starting with 01, 02, etc. and enter this number under Sequence Number. See page 9 for further explanation of sequence numbers.

Office Use Only
Registration No.
3 3 2 4 0

	Facility Type	Facility Use	Date Opened‡	Date Inactive *	Surface Area in Acres (if applicable)
2 1 A	7 0	1	1 0 8 4		
20 23	27	31	70	76	97 106
	See Table 2 (page 11)	See Table 3 (page 11)	Month Yr.	Month Yr.	

	Capacity *	Waste Management Facility Description
2 2 A		C O N T A I N E R S T O R A G E B U I L D I N G
20 23	47	58

Use your own words to describe the facility

Waste Management Facility Description—Continued

117

*See Attachment C

Which wastes are treated, stored or disposed in this waste management facility? Enter the sequence number you assigned for each waste from Part III:

2 4 A	0 0 1	0 0 2						
20 23	27	31	35	39	43	47	51	55 59
	63	67	71	75	79	83	87	91 95
	27	31	35	39	43	47	51	55 59

WASTE SEQUENCE NUMBERS

Office Use Only

	Status	Permit No.	Permit Flag	Date Closed	Deed Flag	Date Deed Recorded
2 1 A	A					

‡PLEASE NOTE—Notification to the TDWR at least 90 days prior to engaging in on-site storage, processing or disposal of non-hazardous industrial solid waste is required by 31 TAC Section 335.6.

PART IV. ON-SITE WASTE MANAGEMENT FACILITY CHARACTERISTICS - CONTINUED

Complete this page if you checked "on-site" in Part III. Complete this sheet for each on-site facility. Copy this form as needed if you have more than two facilities. Refer to the attached tables for the proper codes to use when completing this page.

Sequence Number

Facility No. 0 2 (7) of 03 (total no. of facilities)

Number each facility sequentially starting with 01, 02, etc. and enter this number under Sequence Number. See page 9 for further explanation of sequence numbers.

Office Use Only
Registration No.
3 3 2 4 0

	Facility Type	Facility Use	Date Opened‡	Date Inactive *	Surface Area in Acres (if applicable)
21 A (20–23)	20 (27)	3 (31)	0185 (70)	(76)	(87–106)
	See Table 2 (page 11)	See Table 3 (page 11)	Month Yr.	Month Yr.	

	Capacity *	Waste Management Facility Description
22 A (20–23)	(47)	PLANT REFUSE LANDFILL (58)
		Use your own words to describe the facility

Waste Management Facility Description—Continued

*See Attachment C (117)

Which wastes are treated, stored or disposed in this waste management facility? Enter the sequence number you assigned for each waste from Part III:

24 A (20–23) 003 (27–59)

(63–95)

(27–59)

WASTE SEQUENCE NUMBERS

Office Use Only

	State	Permit No.	Permit Flag	Date Opened	Deed Flag	Date Deed Recorded
21 A	A					

‡PLEASE NOTE—Notification to the TDWR at least 90 days prior to engaging in on-site storage, processing or disposal of non-hazardous industrial solid waste is required by 31 TAC Section 335.6.

PART IV. ON-SITE WASTE MANAGEMENT FACILITY CHARACTERISTICS - CONTINUED

Complete this page if you checked "on-site" in Part III. Complete this sheet for each on-site facility. Copy this form as needed if you have more than two facilities. Refer to the attached tables for the proper codes to use when completing this page.

Sequence Number

Facility No. 0 3 of 03 (total no. of facilities)

7

Number each facility sequentially starting with 01, 02, etc. and enter this number under Sequence Number. See page 9 for further explanation of sequence numbers.

Office Use Only Registration No. 3 3 2 4 0

Facility Type	Facility Use	Date Opened‡	Date Inactive *	Surface Area in Acres (if applicable)
2 1 A	2 0	0 1 8 5		1 3 0
20–23	27	70	76	97–106
	See Table 2 (page 11)	Month Yr.	Month Yr.	
	See Table 3 (page 11)			

Capacity *	Waste Management Facility Description
2 2 A	1.3 x 107 CY
20–23	47
	58

Use your own words to describe the facility

Waste Management Facility Description—Continued

F L Y A S H / F G D S L U D G E / W A S T E W A T E R S O L I D S / B O T T O M A S H L A N D F I L L

117

*See Attachment C

Which wastes are treated, stored or disposed in this waste management facility? Enter the sequence number you assigned for each waste from Part III:

2 4 A	0 0 4	0 0 5	0 0 6	0 0 7				
20–23	27	31	35	39	43	47	51	55	59
	63	67	71	75	79	83	87	91	95
	27	31	35	39	43	47	51	55	59

WASTE SEQUENCE NUMBERS

Office Use Only

	Status	Permit No.	Permit Flag	Date Closed	Deed Flag	Date Deed Recorded
2 1 A	A					
				M M Y Y		M M Y Y

‡PLEASE NOTE—Notification to the TDWR at least 90 days prior to engaging in on-site storage, processing or disposal of non-hazardous industrial solid waste is required by 31 TAC Section 335.6.

Part IV. On-Site Waste Management Facility Characteristics—Continued

3 3 2 4 0

SEQUENCE NUMBERS

In Part III and IV you assigned a number for each waste you generate and each on-site* waste management facility you use to treat, store or dispose of your waste. Waste sequence numbers are 3 digit numbers and facility sequence numbers have 2 digits. For example, if you have two landfills, a surface impoundment and a storage container area, you would assign number 01 for one landfill, 02 for the other landfill, 03 for the surface impoundment and 04 for the storage container area. Each waste is also assigned a number beginning with 001 and continuing using 002, 003, etc. Repeat the sequence numbers you gave each facility and waste below.

FACILITY SEQUENCE NUMBERS

20–23	26–29	32–35	38–41	44–47	50–53	56–59
0 6 A	0 1	0 2	0 3			

62–65	68–71	74–77	80–83	86–89	92–95

98–101	104–107	110–113	116–119	122

WASTE SEQUENCE NUMBERS

20–23	27–31	35–39	43–47	51–55	59
0 7 A	0 0 1	0 0 2	0 0 3	0 0 4	0 0 5

63–67	71–75	79–83	87–91	95

99–103	107–111	115

*The term "on'site" is defined on page 5.

I certify the information herein is complete and accurate to the best of my knowledge:

Jay A. Pruett
Signature

April 3 1985
Date

3324
4/21/81

ATTACHMENT A
PROCESS DESCRIPTION
H. W. PIRKEY POWER PLANT - #33240
TEXAS DEPARTMENT OF WATER RESOURCES
INDUSTRIAL SOLID WASTE MANAGEMENT INVENTORY

Waste No. 004 - Fly Ash/FGD Sludge/Wastewater Treatment Solids/Bottom Ash

Process Description

171380 m

Fly Ash is a fine particulate composed mainly of non-combustible materials present in lignite. As the lignite is pulverized and burned, this particulate is entrapped in the exhaust gas-flow and recaptured via an electrostatic precipitator.

141580 m

FGD Sludge is the resultant product of the flue-gas desulfurization system. FGD sludge is primarily composed of calcium sulfites and calcium sulfates produced by combining an alkaline calcium solution, containing hydroxides and carbonates with the sulfur oxides in the flue-gas stream. Initially, this product will be produced as a filter cake, following which a stabilization process will mix the filter cake with sufficient fly ash and, if necessary, stabilization additives to produce a final product.

149000 m

Wastewater Treatment Solids - Bottom ash transport system blowdown, material storage runoff and the metal cleaning wastewater streams are routed through the wastewater treatment system when the quality of these streams warrant treatment prior to discharge as described in the NPDES and TDWR Wastewater Permits. The solids which are removed in the treatment process are ultimately disposed in the Fly Ash/FGD Sludge/Wastewater Treatment Solids/Bottom Ash Landfill.

172570 m

Bottom Ash is the ash residue left when the lignite fuel is burned in the plant's main boiler. This residue ash or bottom ash, falls to the bottom of the boiler furnace and is collected in the bottom ash hopper. Also included in bottom ash is the economizer ash which is also a residue ash but is carried out of the top of the main boiler furnace by the boiler exhaust flue gas flow. This residue ash is deposited, or falls out of the flue gas stream, as the gas passes over the economizer section of the main boiler.

The bottom ash is sluiced to two primary bottom ash settling basins thence to the secondary settling basin. The discharges associated with these basins are regulated under the H. W. Pirkey Power Plant's NPDES and TDWR Wastewater Permits. However, it may become necessary to remove the bottom ash sediment from these settling basins for disposal in the Fly Ash/FGD Sludge/Wastewater Treatment Solids/ Bottom Ash Landfill.

ATTACHMENT B
WASTE COMPONENTS
H. W. PIRKEY POWER PLANT - #33240
TEXAS DEPARTMENT OF WATER RESOURCES
INDUSTRIAL SOLID WASTE MANAGEMENT INVENTORY

Waste Number - 004 - Fly Ash/FGD Sludge/Wastewater Treatment Solids/Bottom Ash

Waste Components

Fly Ash

Constituent	Ash Analysis %
SiO_2	50
Al_2O_3	16.8
TiO_2	1.0
Fe_2O_3	14.5
CaO	6.7
MgO	2.0
Na_2O	1.5
K_2O	1.36
SO_3	6.05
P_2O_5	0.03
SiO_2/Al_2O_3 Ratio	3.0

FGD Sludge

Constituents

Calcium Sulfite
Calcium Sulfate
Water
Lime

Wastewater Treatment Solids

Constituent		% By Weight
$CaSO_4$	$CaSO_4$	57
$Fe(OH)_2$	$Fe(OH)_2$	27
$Mg(OH)_2$	$Mg(OH)_2$	10
Inerts	Inerts	6
SiO_2	SiO_3	42-67
Al_2O_3	Al_2O_3	14-30
TiO_2	TiO_2	0.6-1.4
FeO_3		2.5-20
[illegible]	?	1.5-14
[illegible]	?	0.6-3.6
[illegible]	?	0.6-1.7
Na_2O		0.3-3.5
[illegible]		0-0.5
SO_3	SO_3	0.6-14

Bottom Ash

Constituents	% By Weight
SiO_3	42-67
Al_2O_3	14-30
TiO_2	0.6-1.4
FeO_3	2.5-20
CaO	1.5-14
MgO	0.6-3.6
K_2O	0.6-1.7
Na_2O	0.3-3.5
P_2O_5	0-0.5
SO_3	0.6-14

ATTACHMENT C
ON-SITE WASTE MANAGEMENT FACILITY CHARACTERISTICS
H. W. PIRKEY POWER PLANT - #33240
TEXAS DEPARTMENT OF WATER RESOURCES
INDUSTRIAL SOLID WASTE MANAGEMENT INVENTORY

Facility No. 01 - Container Storage Building

Wastes Stored	Capacity
001 - Waste Oil	Varies with plant operation
002 - Varsol (Mineral Spirits)	330 gallons

Date facility will be inactive - Facility will be in operation for life of plant

Facility No. 02 - Plant Refuse Landfill

Wastes Stored	Capacity
003 - Plant Refuse	Varies with plant operation

Date facility will be inactive - Facility will be in operation for life of plant

Facility No. 03 - Fly Ash/FGD Sludge/Wastewater Treatment Solids/Bottom Ash Landfill

Wastes Stored	Capacity
004 - Fly Ash/FGD Sludge/ Wastewater Treatment Solids/ Bottom Ash	1.3×10^7 cubic yards

Date facility will be inactive - Facility will be in operation for life of plant

TEXAS WATER COMMISSION

Rob
Maria - FYI

RECEIVED
EPA REGION VI
88 AUG 22 PM 1:45
HAZARDOUS WASTE MGMT. DIV.

Paul Hopkins, Chairman
John O. Houchins, Commissioner
B. J. Wynne, III, Commissioner

J. D. Head, General Counsel
Michael E. Field, Chief Examiner
Karen A. Phillips, Chief Clerk

Allen Beinke, Executive Director

RCRA
IV. 4.

NOTICE OF RECEIPT OF AN APPLICATION FOR
AND DECLARATION OF ADMINISTRATIVE COMPLETENESS

An industrial solid waste permit application for:

Southwestern Electric Power Company TXD000726380
P.O. Box 21106
Shreveport, Louisiana 71156

was received by the Texas Water Commission on June 2, 1988 and declared to be administratively complete on August 10, 1988.

Type of Operation: Storage

Location: 1221 Karnes Rd., Longview, Gregg County, Texas

Remarks: The proposed permit is for a container storage facility at SWEPCO's Longview Service Center for storage of Polychlorinated Biphenyls (PCBs) and PCB-contaminated equipment prior to off-site disposal.

The Executive Director has reviewed this application and declares it to be administratively complete.

The application will now be subject to technical evaluation by the staff of the Texas Water Commission. Persons should be advised that the application is subject to change based on such evaluation.

The Commission will issue further notice of the application and the terms of any proposed draft permit once the technical evaluation is completed.

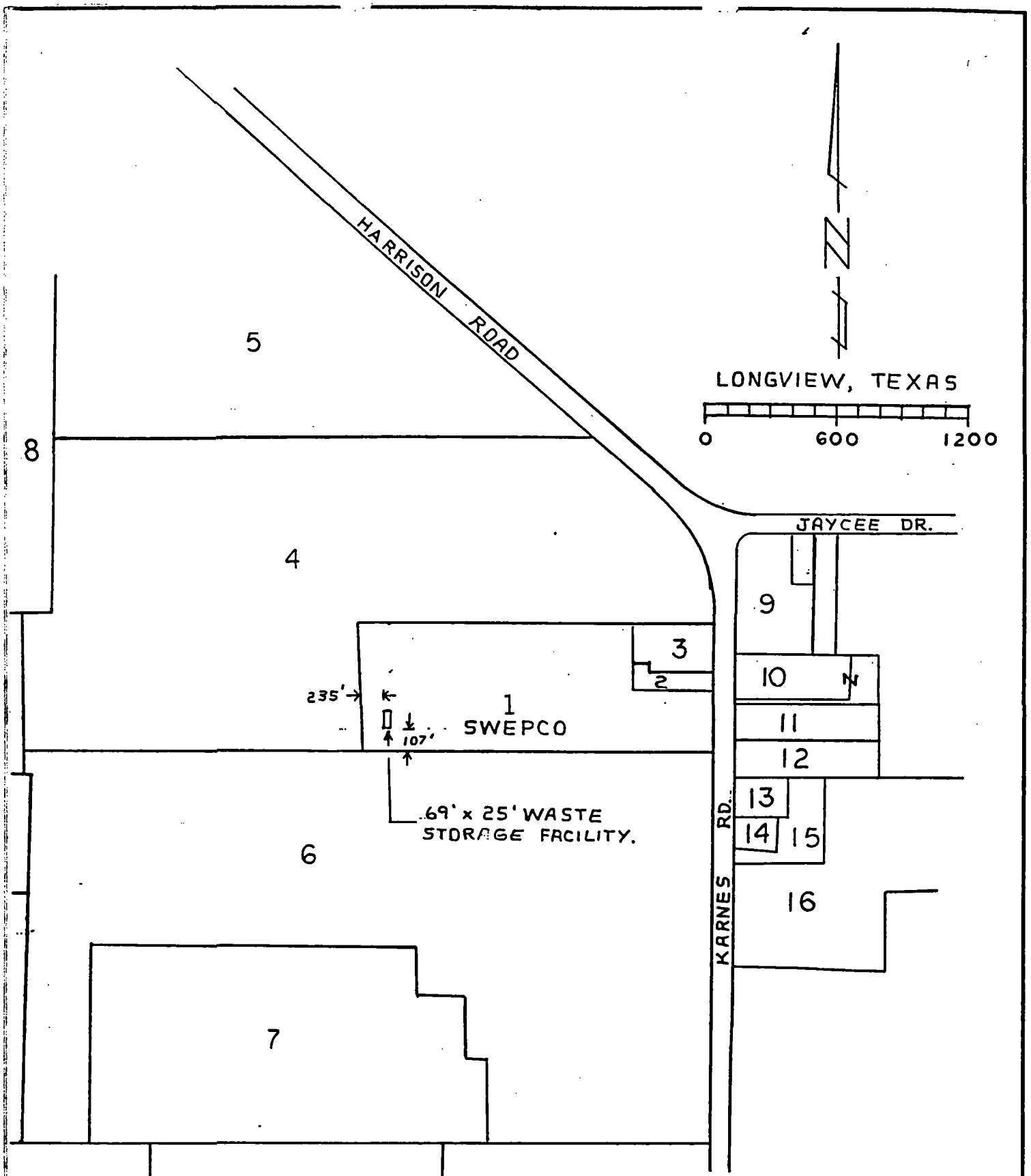
The identification number of this application is SW-39080. Further information concerning this application may be obtained by contacting:

Ken Zarker, Head
Reports and Information
Management Unit
Hazardous and Solid Waste Division
(512) 463-7761

Karen A. Phillips

Karen A. Phillips, Chief Clerk
Texas Water Commission

Issued: August 19, 1988



ATTACHMENT "A" - WASTE STORAGE FACILITY SITE AND ADJACENT PROPERTIES, LONGVIEW, TEXAS.

ENGINEERING	DEPT.	
EAST TEXAS	DIV.	
APPROVED		
DRWN. BY MCT	DATE 1-12-87	
SCALE 1" ≈ 600'	W.O.	
SOUTHWESTERN ELECTRIC POWER CO.	SH.	DRWG. NO.

RECEIVED
MAR 11 1985
ENFORCEMENT AND FIELD OPERATIONS

6

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Bryan W. Dixon, Chief, Solid Waste & Spill Resp. DATE: March 5, 1985

THRU :

FROM : Billy H. Boggs, District 5 Supervisor

SUBJECT: High Priority Violator Determination - Southwestern Electric Power Company - Pirkey Steam Electric Station, S.W. Registration Number 33240.

Attached is an Investigation Report prepared by Joe D. Woodard concerning a possible High Priority Violator - Southwestern Electric Power Company. Please review this report to make a determination if Southwestern Electric Power Company is a High Priority Violator. If a High Priority determination is made, please accept this I.O.M. as a request for enforcement action.

Billy H. Boggs

Billy H. Boggs

Attachments

Investigation Report
Southwestern Electric Power Company
Pirkey Steam Electric Station
Solid Waste Registration No. 33240
P. O. Box 33
Hallsville, Texas 75650

I. Introduction:

A. Identification: The Southwestern Electric Power Company's Pirkey Steam Electric Station is located in Harrison County, east of Hallsville and south of Interstate Highway 20. The mailing address for the Pirkey Plant is as listed above. The Southwestern Electric Power Company(SWEPCO) main office address is P. O. Box 21106, Shreveport, Louisiana 71156.

B. Permits and Registrations: The Pirkey plant was assigned Solid Waste Registration number 33240, but a registration was never issued by the TDWR. SWEPCO submitted a Part A application for a hazardous waste permit to the Environmental Protection Agency on November 18, 1980, but did not submit one to the TDWR. An industrial solid waste management inventory was submitted to the TDWR on April 21, 1981, but it was for the registration of plant construction debris which was to be disposed into an on-site landfill.

The Pirkey plant also has been issued by the TDWR a wastewater permit, 02496, for eight different outfalls.

C. Permit Provisions: Although a Solid Waste Registration number, 33240, was issued to this facility, a registration has not been issued. The solid waste registration inspection which was conducted on February 21, 1985, was accomplished without the aid of a registration which should probably reflect the following generated wastes: construction debris and plant trash; waste oils; waste Varsol; metal cleaning wastes; fly ash and scrubber sludge; and bottom ash.

D. Background information: The Pirkey plant is a newly constructed lignite-fired steam electric station which is in its start-up phase. The metal cleaning surface impoundment which was discovered to be hazardous because of pH (1.53 s.u.) was initially used approximately two months ago. According to company personnel, the boiler has been cleaned only once and was for start-up purposes.

II. Waste Handling Facility:

A. Type of facility: The Pirkey plant is a steam electric power station which generates electricity for SWEPCO customers.

B. Description of Facilities: There are two landfills located at Pirkey. One is a small landfill (100'x30'x10') which is used for construction debris and plant trash. The other landfill receives fly ash and scrubber sludges. It has a potential size of 129.65 acres; however, the first phase of 15.78 acres is presently active. There are six surface impoundments which are also listed in the wastewater permit, 02496. They include the Surge Pond (4 acres or 21 acre feet); the Lignite runoff basin (4.5 acres or 28.6 acre feet); Bottom ash basin No. 1 (29 acres or 210 acre feet); Bottom ash basin No. 2 (26 acres or 207 acre feet); the Second ash pond (2.6 acres or 12 acre feet); and the metal cleaning pond (2.5 acres) which was discovered to contain unneutralized metal cleaning wastewater with a pH of 1.53 standard units.

III. Water Quality Impact:

A. Surface water: Permit No. 02496 allows for authorized permitted outfall discharges into Brandy Creek Reservoir; however, the metal cleaning pond with its low pH wastewater had not been released.

B. Ground water: The surface impoundments are all clay lined. The integrity of the clay liner in the metal cleaning pond, which has been subjected to acidic wastewater for approximately two months, is unknown. Although the company has ten ground water monitoring wells located aroun the plant site, they have not been sampled or tested for contaminants.

IV. Previous Enforcement Action:

None.

V. Violations:

Violation	Data Source	Permit or other Requirement
1. No registration; no update	2-21-85 insp.	335.6
2. H. W. Determination of wastes	2-21-85 insp. Chain of Custody Tag SW06313	335.62
3. Lack of General Insp. Reg.	2-21-85 insp.	335.116
4. No personnel training	2-21-85 insp.	335.117
5. Lack of Preparedness & Prevention	2-21-85 insp.	335.131
6. Lack of Contingency Plan	2-21-85 insp.	335.152
7. Lack of Ground Water Monitoring around metal cleaning pond	2-21-85 insp.	335.191
8. Closure Plan	2-21-85 insp.	335.213
9. Post Closure Plan	2-21-85 insp.	335.218
10. Financial Requirements	2-21-85 insp.	335.231
11. Surface Impoundments	2-21-85 insp.	335.281

VI. Causes of Violations:

SWEPCO has been operating under the assumption that since the surface impoundments are regulated under wastewater permit No. 02496 they would not be regulated under solid waste. The company was also under the impression that a hazardous waste permit would not be required.

During the initial stage of the 2-21-85 inspection, company personnel, Mr. Jay Worley and Mr. Bobby Welch, stated that the metal cleaning waste was neutralized in line before being placed into the impoundment. They further stated that the plant had the capability of pumping water from the impoundment into a wastewater treatment plant for further treatment before discharging the water under outfall 007 of Permit 02496. When the impoundment was visually inspected, a large hole was observed in the concrete splash pad. A decision was then made to have the Pirkey lab personnel collect a sample from the pond and analyze it for pH. The company lab measured the pH to be 1.18 s.u. Plant personnel were then advised that the impoundment had not been neutralized and that the impoundment had to be considered hazardous. The pond is 2.5 acres in size and had approximately 2 feet of wastewater above a clay lined bottom.

Mr. Worley later informed me that the start-up engineer had inadvertently overlooked the neutralization requirement in the boiler cleaning procedure. The cleaning was contracted to Haliburton who used 5% Hydrochloric acid and 0.25% Ammonia Biflouride in the process.

Since the company had hoped to operate without a hazardous waste permit, none of the other requirements which go along with a permit and/or ground water monitoring had been instituted at this plant.

A follow-up inspection was conducted on 2-25-85 for the purpose of collecting a water sample from the pond (Chain of Custody Tag SW 06313). It revealed a pH of 1.53 s.u. (see attached results). The Pirkey lab also measured the pond pH on 2-25-85 and obtained another 1.18 s.u.

VII. Technical Recommendations:

1. Mr. Jay Pruett of the SWEPCO Shreveport office telephoned the District 5 office on 2-28-85 and informed us that the wastewater in the metal cleaning pond was going to be treated to raise the pH above 2.0 s.u. The company should either submit a closure plan for this impoundment or a request for a hazardous waste permit within 30 days.

2. SWEPCO should submit a registration update within 10 days.

3. If no closure plan is submitted, ground water monitoring around the metal cleaning should be instituted within 45 days.

4. If the company cannot qualify for permitting exemption, then the company should comply with personnel training, contingency plans, preparedness and prevention, financial requirements, and any other applicable requirements within 60 days.

3/5/85 7

TEXAS DEPARTMENT OF WATER RESOURCES
Industrial Solid Waste Compliance Monitoring Inspection Report

CONTENTS

FACILITY NAME SWEPCO - HENRY W. PIRKEY POWER PLANT REGISTRATION NO. 33240

✓ 1. Code Sheet (0814)

✓ 2. Contents Sheet

✓ 3. Generator/Facility Checklist (includes Coversheet)

✓ 4. Component Facility Checklists*

- ✓ A. Containers (C) - See Section F of Generators Checklist
- ___ B. Tanks (T)
- ✓ C. Surface Impoundments (SI)
- ___ D. Waste Piles (WP)
- ___ E. Land Treatment (LT)
- ✓ F. Landfills (LF)
- ___ G. Incinerators (I)
- ___ H. Thermal Treatment (TT)
- ___ I. Chemical, Physical, or Biological Treatment (TR)
- ___ J. Other (O) _____

___ 5. (a) Closure and Post Closure Checklist, ___ (b) Closure Supplement

✓ 6. (a) Facility Status Sheet(s), ✓ (b) Ground Water Monitoring Page

___ 7. Ground Water Monitoring Program Checklist

___ 8. Letter of Violation Notification

___ 9. Interoffice Memorandum

___ 10. Registration — NONE

✓ 11. Maps, Plans, Sketches

✓ 12. Other (describe) PHOTOS, SKETCHES

* If a required Checklist is omitted, explain: GROUND WATER MONITORING PROGRAM CHECKLIST IS OMITTED. NO GWM WELLS AROUND H.W. IMPOUNDMENT (pH of 1.53 s.u.). COMPANY HAS 10 GW.M. WELLS AROUND PLANT SITE, BUT ARE INACTIVE (NO TESTING OF WELLS).

Att. 7 pg 1

TEXAS DEPARTMENT OF WATER RESOURCES
Industrial Solid Waste Compliance Monitoring Inspection Report

INSPECTION COVER SHEET

Major ____ TDWR Registration No. 33240 C.O. Use Only

Nonmajor ✓ EPA ID No. TXD000726380 0385

Data Entry Date

NAME OF COMPANY SWEPCO - HENRY W. PIRKEY POWER PLANT

ADDRESS P.O. BOX 33 HALLSVILLE, TEXAS 75650 PHONE (214) 935-318

SITE ADDRESS EAST OF HALLSVILLE AND SOUTH OF IH-20 PHONE (214) 935-318

COUNTY HARRISON TYPE OF INDUSTRY ELECTRIC POWER PRODUCTION

Part A Application submitted to the State ? Yes___ No ✓ To EPA ? Yes ✓ No___

Affidavit of Exclusion submitted to the State ? Yes___ No ✓ To EPA ? Yes___ No ✓

Will this facility require a permit ? Yes ✓ No___

Current Waste Management Activity (Indicate IH, INH, II, III or check as appropriate) :

Generator _____ Transporter _____ Small Quantity Generator _____

Treatment _____ Disposal _____ Storage _____ 90-Day Storage _____

SE COMM SECT

HW Facilities (circle the appropriate facility codes): (C) T (SI) WP LT LF I TT TR O

Anomalies in the above information will be addressed by : (a) Enforcement in progress ____,

(b) Central Office ____, (c) District Office ____, (d) Owner/Operator ____. N/A

Inspection Information :

Type of Evaluation or Inspection (circle one) (EV) GW SA FO OT CL SW

Inspector's Name and Title JOE D. WOODARD, TOM CUSACK

Inspection Participants BOBBY WELCH, BRIAN BOND, JAY WORLEY

Inspection Date(s) 2-21-85 AND 2-25-85

Approved : Billy H Boggs
District Supervisor

Signed : Joe D Woodard
Inspector

Date : 3-5-85

10/1/84

pg 2

GENERATORS CHECKLIST

Section A - Notification and Waste Determination (335.6, .52, .63)

***

1. A determination has been made that the solid waste(s) generated is either hazardous or nonhazardous. - SEE COMMENTS SECTION YES ✓ NO___

2. If the answer to # 1 is yes, check the method used for determination :

   a. Listed as a hazardous waste in 40 CFR Part 261, Subpart D. ✓

   b. Process or materials knowledge. ___

   c. Tested for characteristics as identified in 40 CFR Part 261, Subpart C (If equivalent test method is used, attach a copy). ___

3. The following wastes, if generated, have been tested to determine nonhazardous characteristics :

   a. Class I nonhazardous — N/A ✓ YES___ NO___

   b. Class II — N/A ✓ YES___ NO___

   c. PCB (storage) — N/A ✓ YES___ NO___

   REGISTRATION 33240 HAS NOT BEEN ISSUED

   If "no" is answered to any of the above, list on the comments sheet those wastes deemed not hazardous or the processes from which nonhazardous wastes are produced.

4. Notification of waste stream changes are current. N/A___ YES___ NO ✓

5. Waste management (T/S/D) methods in use agree with registration. NO REGISTRATION N/A___ YES___ NO___

6. Facility has received an EPA ID number. N/A___ YES ✓ NO___

7. Does this facility generate waste oils ? N/A___ YES ✓ NO___

   a. Waste oils are disposed of at authorized facilities. (SOLD TO STARR SOLVENTS OF LONGVIEW FOR RECOVERY) N/A___ YES ✓ NO___

8. Does this facility generate spent solvents ? N/A___ YES ✓ NO___

   a. Spent solvents are disposed of at authorized facilities. (SOLD TO STARR SOLVENTS OF LONGVIEW FOR RECOVERY) N/A___ YES ✓ NO___

9. Does this facility utilize sumps in the management of hazardous wastes ? Explain in comments. N/A___ YES___ NO ✓

*** An entry in this column indicates corrective action is needed.

Section B - Special Conditions (335.75)

1. If a generator has received from or transported to a foreign source any hazardous waste, the appropriate notice has been filed with the Regional Administrator (EPA). *** N/A ✓ YES___ NO___

2. Waste was manifested and signed by the foreign consignee N/A ✓ YES NO

3. Confirmation of waste transport out of the country has been received by the generator. N/A ✓ YES___ NO___

Section C - Recordkeeping and Reporting (335.9, .10, .13, .70 - .72)

1. Generator maintains the required records and reports for the necessary three years. (POWER PLANT HAS BEEN IN OPERATION FOR APPROXIMATELY 2 MONTHS — NO RECORDS AT THIS INSPECTION.) N/A ✓ YES___ NO___

   a. Shipping tickets _____ b. Monthly summaries _____

   c. Tests and analyses _____ d. Annual reports _____ e. Exception reports _____

2. Spills, unauthorized discharges or threats of such discharge have been reported (335.4, .453) N/A ✓ YES___ NO___

   a. Spills or discharges have been remedied. (335.453) N/A ✓ YES___ NO___

***** DO NOT COMPLETE SECTION D IF GENERATOR DISPOSES OF HAZARDOUS AND/OR NONHAZARDOUS WASTES ONSITE ONLY *****

Section D - Pretransport and Manifest Requirements (335.61 - .69)

1. Identify primary off-site disposal facilities using comments sheet or copy of registration. EVERYTHING IS DISPOSED OF ONSITE EXCEPT THE WASTE OILS & WASTE VARSOL WHICH GO TO STARR SOLVENTS OF LONGVIEW.

   a. Off-site disposal facilities are either currently permitted or operating under interim status standards. N/A___ YES ✓ NO___

2. TDWR manifest/shipping ticket is properly completed. (NOT BEING USED) N/A___ YES___ NO___

3. Generator receives the return (white) copy of shipping ticket. DO NOT USE MANIFESTS AT THIS TIME — WASTE OILS AND SOLVENTS HAVE NOT BEEN CLASSIFIED N/A___ YES___ NO___

***** STOP HERE IF FACILITY QUALIFIES AS A SMALL QUANTITY GENERATOR *****

4. Containers used to hold waste(s) meet the DOT packaging requirements of 49 CFR Parts 173, 178, and 179 before being offered for transport (if circumstances observed). N/A___ YES ✓ NO___

5. Generator labels and marks each package in accordance with 49 CFR Part 172 (if circumstances observed). N/A___ YES___ NO___ SEE COMMENT

WASTE OILS & WASTE VARSOL ARE STORED IN DRUMS, BUT ARE NOT LABELED OR MARKED. SINCE THERE IS NO REGISTRATION, THIS INSPECTOR DOES NOT KNOW IF THE WASTES ARE HAZARDOUS OR NOT.

***

6. Each container of 110 gallons or less is marked with the required hazardous waste warning label. N/A___ YES___ NO___

7. Generator placards off-site waste shipments in accordance with DOT regulations under 49 CFR Part 172, Subpart F. N/A___ YES___ NO___

SEE COMMENT ON PAGE 2 OF 3 FOR QUESTION 5.

Section E - Accumulation Time (335.69)

Note: A facility may accumulate and store hazardous wastes for up to 90 days without a permit.

1. Each container used to temporarily store waste before transport is clearly dated. (DRUMS ARE NOT DATED, BUT I DON'T KNOW IF WASTES ARE HAZARDOUS OR NOT.) SEE COMMENT N/A___ YES___ NO___

2. Containers ~~and /or tanks~~ are labeled as "Hazardous Waste" while accumulating on site. (THERE ARE NO LABELS ON THE DRUMS — THE WASTE OILS & WASTE VARSOL NEED TO BE CLASSIFIED.) SEE COMMENT N/A___ YES___ NO___

Section F - Container Management (335.241 - .247)

1. Wastes are being stored in containers of good condition and of the appropriate type. N/A___ YES ✓ NO___

2. Generator inspects containers for leakage or corrosion at least weekly. (THERE ARE NO WRITTEN INSPECTION LOGS. DRUMS ARE VIEWED DAILY.) N/A___ YES ✓ NO___

3. Generator locates containers holding ignitable or reactive waste at least 15 meters (50 feet) from the facility's property line. N/A___ YES ✓ NO___

4. Containers holding incompatible wastes are separated by a physical barrier or sufficient distance. N/A ✓ YES___ NO___

5 Storage area has containment protection as described in 40 CFR Part 264 (this will be a future permit requirement). N/A___ YES ✓ NO___

6. Describe drum or container storage area using comments sheet and/or photos. DRUMS ARE STORED IN A METAL BUILDING WITH A CONCRETE FLOOR. THE FLOOR HAS A CATCH BASIN IN THE MIDDLE TO COLLECT AN SPILLAGE WHICH CAN BE PUMPED BACK INTO A DRUM.

Note: If tanks are used at the facility, complete the Tanks Checklist. N/A

Note: If this is a T/S/D Facility, proceed to Facilities Checklist.

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Checklist GENERATORS

Date 3-5-85

Reg./~~Permit~~ No. 33240

COMMENTS SHEET

INSPECTION COVER SHEET

Section — / Paragraph —: A FEDERAL PART A APPLICATION WAS SUBMITTED BY SWEPCO ON 11-18-80. A TDWR SOLID WASTE REGISTRATION NUMBER (33240) WAS ASSIGNED, BUT A S.W. REGISTRATION WAS NEVER ISSUED. THE PIRKEY POWER PLANT GENERATES THE FOLLOWING WASTES WITH THEIR RESPECTIVE DISPOSITIONS: CONSTRUCTION DEBRIS AND GENERAL

Section ____ / Paragraph ____: PLANT TRASH — ONSITE LANDFILL; WASTE OILS - DRUMS - OFFSITE RECOVERY. VARSOL SOLVENT — DRUMS - OFFSITE RECOVERY. METAL CLEANING WASTES - SURFACE IMPOUNDMENT - ONSITE. FLY ASH AND SCRUBBER SLUDGE — LANDFILL - ONSITE. BOTTOM ASH - SURFACE IMPOUNDMENT - ONSIT

SINCE NO REGISTRATION HAS BEEN ISSUED, DISTRICT 5 COULD

Section ____ / Paragraph ____: NOT INDICATE THE CLASSIFICATIO OF CURRENT WASTE MANAGEMENT ACTIVITY ON THE INSPECTION COVER SHEET.

Section A / Paragraph 1: THE FEDERAL PART A APPLICATIO LISTED THE FOLLOWING HAZARDOUS WASTES: D002 - CORROSIV WASTES - MR JAY PRUETT OF SWEPCO STATED THAT THE METAL CLEANING PONDS WOULD BE INCLUDED UNDER THIS H.W. CODE, D001 - IGNITABLE, F002 - SPENT HALOGEN SOLVENTS, U219 - THIO-CARBAMIDE, U210 - 1,1,2,2 TETRACHLOROETHENE

Checklist GENERATORS

Date 3-5-85

Reg./~~Permit~~ No. 33240

COMMENTS SHEET

Section A / Paragraph 1 : CONTINUED: U013 - ASBESTOS, U044 - TRICHLOROMETHANE, U002 - ACETONE, U220 - METHYL BENZENE, U154 - METHANOL. THIS LIST HAS NOT BEEN UPDATED FOR CORRECTION, DELETION, OR ADDITION.

Section _____ / Paragraph _____ :

Section _____ / Paragraph _____ :

Section _____ / Paragraph _____ :

FACILITIES CHECKLIST

Site information (T/S/D Facilities Only) :

Are facilities located within the 100-year floodplain ? No

Describe land use within one mile RURAL

Closed or abandoned facilities ? NONE

Section A - General Facility Standards

1. Proof of deed recordation of on-site disposal facilities has been provided to the agency. THE CONSTRUCTION DEBRIS & PLANT TRASH LANDFILL WAS DEED RECORDED ON 11-20-81. THE OTHER LANDFILLS HAVE NOT BEEN RECORDED. (SEE COMMENT)*** N/A___ YES___ NO___
2. A sketch of facilities, general site orientation showing landfills, surface impoundments, injection wells, drainage routes, water bodies and courses and other pertinent features (separate sketch or diagram of landfills, etc.) should be attached to this and other facility checklists. (SEE SKETCH)

Note: For all nonhazardous, noncommercial facilities, do not complete the remainder of this Facilities Checklist. Proceed to the specific component facility checklist(s) and complete one for each waste management facility (one checklist can cover multiple facilities of one type if comments address individual violations).

Section B - Personnel Training (335.117)

1. Owner/operator maintains proper personnel training records at the facility. N/A___ YES___ NO ✓
2. Personnel training records include:
   a. Job title and written job description of each position. N/A___ YES___ NO ✓
   b. Description of type and amount of training. N/A___ YES___ NO ✓
   c. Records of training given to facility personnel. N/A___ YES___ NO ✓
3. Personnel training records are maintained for the appropriate length of time. N/A___ YES___ NO ✓
4. Training program is adequate for response to emergencies. N/A___ YES___ NO ✓

Section C - Preparedness and Prevention (335.131 - 137)

1. Describe any evidence of fire, explosion, or contamination of the environment in the comments sheets. (pH OF METAL CLEANING POND WAS 1.53 S.U ON 2-25-85.

*** An entry in this column indicates corrective action needed.

2. Facility is equipped with: ***

a. Internal communication or alarm system within easy access. N/A___ YES ✓ NO___

b. Telephone or two-way radio to call emergency response personnel. N/A___ YES ✓ NO___

c. Portable fire extinguishers, fire control equipment, spill control equipment and decontamination equipment are tested regularly to assure proper operation. N/A___ YES ✓ NO___

d. Available water supply volume and pressure are adequate for hoses, sprinklers or water spray system. N/A___ YES ✓ NO___

3. Aisle space is sufficient to allow unobstructed movement of personnel and equipment. N/A___ YES ✓ NO___

4. Owner/operator has attempted to make arrangements with the local response authorities to familiarize them with the layout of the facility, properties of hazardous wastes handled and associated hazards, work locations of facility personnel, entrances to facility roads and possible evacuation routes. N/A___ YES___ NO ✓

5. In the event that more than one law enforcement or fire department might respond, a primary authority has been designated. N/A___ YES___ NO ✓

6. Owner/operator has attempted to reach agreements with State emergency response teams, emergency response contractors and equipment suppliers. N/A___ YES___ NO ✓

7. Owner/operator has attempted to make arrangements with local hospitals to familiarize them with the properties of the hazardous wastes handled and the types of injuries that could result from fires, explosions or releases from the facility. N/A___ YES___ NO ✓

8. State or local authorities have entered into the necessary arrangements. N/A___ YES___ NO ✓

Section D - Contingency Plan and Emergency Procedures (335.151 - .157)

1. A contingency plan is maintained at the facility. N/A___ YES___ NO ✓

2. The contingency plan is:
   a. a revised SPCC plan _____
   b. a separate document _____
   c. adequate to meet emergency procedures requirements. N/A___ YES___ NO ✓

3. Emergency coordinator is on site or on call at all times. N/A___ YES ✓ NO___

*** **STOP HERE IF FACILITY ACCUMULATES WASTE ON SITE FOR LESS THAN 90 DAYS** ***

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Section E - Waste Analysis (335.114) ***

1. Facility has a waste analysis plan. N/A___ YES___ NO ✓

2. Waste analysis plan is maintained at the facility. N/A___ YES___ NO ✓

3. Waste analysis plan includes the following:

   a. Parameters for which each waste will be analyzed. N/A___ YES___ NO ✓

   b. Test methods used to test for these parameters. N/A___ YES___ NO ✓

   c. Sampling method used to obtain sample. N/A___ YES___ NO ✓

   d. Frequency with which the initial analysis will be reviewed or repeated. N/A___ YES___ NO ✓

   Note: Frequency includes the requirement to repeat analysis whenever waste stream or process is changed.

   e. Waste analyses that generators have agreed to provide. N/A___ YES___ NO ✓

   f. For off-site disposal facilities, the procedures which are used to inspect and analyze each movement of hazardous waste, including:

      1) Procedures to be used to determine the identity of each movement of waste. N/A ✓ YES___ NO___

      2) Sampling method to be used to obtain a representative sample of the waste to be identified. N/A ✓ YES___ NO___

Section F - Security (335.115)

1. The facility provides adequate security. N/A___ YES ✓ NO___

   a. ✓ 24-hour surveillance system, OR

   b. ✓ Artificial and/or natural barrier around facility, AND

   Describe: FENCE, GUARDS

   c. ✓ Means to control access through entrances.

   Describe: GUARD HOUSES AT GATES

2. Facility has a sign with the legend "Danger - Unauthorized Personnel Keep Out". N/A___ YES ✓ NO___ ***

Section G - General Inspection Requirements (335.116)

1. Facility has a written inspection plan and schedule. N/A___ YES___ NO ✓

2. Inspection plan is maintained at the facility. N/A___ YES___ NO ✓

3. Plan and schedule provide for the inspection of the following:

   a. Monitoring equipment N/A___ YES___ NO ✓

   b. Safety and emergency equipment N/A___ YES___ NO ✓

   c. Security devices N/A___ YES___ NO ✓

   d. Operating and structural equipment. N/A___ YES___ NO ✓

4. Schedule or plan identifies the types of problems to be looked for during the inspection. N/A___ YES___ NO ✓

   a. Malfunction and deterioration N/A___ YES___ NO ✓

   b. Operator error N/A___ YES___ NO ✓

   c. Discharge or threat of discharge N/A___ YES___ NO ✓

5. The owner/operator maintains an inspection log which includes:

   a. Date and time of inspection N/A___ YES___ NO ✓

   b. Name of inspector N/A___ YES___ NO ✓

   c. Notation of observations N/A___ YES___ NO ✓

   d. Date and nature of repairs and remedial action. N/A___ YES___ NO ✓

6. Malfunctions or other deficiencies noted in the inspection log have been rectified. N/A___ YES___ NO ✓

7. Inspection log records are maintained for three years. N/A___ YES___ NO ✓

Section H - Requirements for Ignitable, Reactive or Incompatible Wastes (335.118)

1. Owner/operator is familiar with the proper separation and safeguards needed to prevent ignition or reaction of wastes. N/A___ YES ✓ NO___

   a. Use comments sheet to describe separation and confinement procedures.

   b. Use comments sheet to describe any potential sources of ignition or reaction.

***

2. Smoking and open flame are confined to specifically designated smoking areas. N/A___ YES ✓ NO___

3. "No Smoking" signs are posted in hazardous areas. N/A___ YES ✓ NO___

Section I - Manifest System, Recordkeeping and Reporting (335.171 - .177)

1. Owner/operator complies with the manifest requirements. NO MANIFEST AT THIS TIME; WASTES ARE NOT CLASSIFIED ON A REGISTRATION (SEE COMMENT N/A___ YES___ NO___

   Note: If #1 is not applicable (N/A), go to #6.

2. Waste received from a rail or water (bulk shipment) transporter are accompanied by a properly executed shipping paper. N/A ✓ YES___ NO___

3. All shipments of wastes received have been consistent with the manifests. N/A ✓ YES___ NO___

4. Unmanifested wastes are reported to the Executive Director. N/A ✓ YES___ NO___

5. Discrepancies have been reconciled with the generator and transporter. N/A ✓ YES___ NO___

6. Owner/operator keeps a written operating record at the facility. N/A ✓ YES___ NO___

7. Operating record reflects the following:

   a. Description and quantity of each hazardous waste received and methods and date of treatment/storage/disposal at the facility. N/A ✓ YES___ NO___

   b. Location and quantity of each hazardous waste within the facility. N/A ✓ YES___ NO___

   c. Records and results of waste analyses and trial tests. N/A ✓ YES___ NO___

   d. Summary reports of all incidents that require inplementation of the emergency contingency plan. N/A ✓ YES___ NO___

   e. Closure cost estimates for all facilities. N/A ✓ YES___ NO___

   f. Post-closure cost estimates for all disposal facilities. N/A ✓ YES___ NO___

Section J - Financial Assurance (335.233)

***

1. Preinspection call to Central Office (5516) confirms that facility has submitted current financial assurance documentation. N/A___ YES___ NO ✓

2. If yes, indicate the documents submitted and their respective values:

   ____ Sudden Liability - Amount: $_____ per occurance, $_____ annual.

   ____ Non-sudden Liability - Amount: $_____ per occurance, $_____ annual.

   ____ Closure Assurance - Amount: $_____

   ____ Post Closure Assurance - Amount: $_____

3. Financial Assurance Officer reports that documentation is adequate. N/A ✓ YES___ NO___

   If no, describe deficiencies:

Checklist FACILITIES

Date 3-5-85

Reg./~~Permit~~ No. 33240

COMMENTS SHEET

Section GENERAL INFORMATION / Paragraph —: ALTHOUGH THE COMPANY LISTED HAZARDOUS WASTE ON THE FEDERAL PART A, THE COMPANY CONTENDS THAT THEY DO NOT MEET THE REQUIREME FOR A HAZARDOUS WASTE PERMIT AND THEREFORE DID NOT NEED THE PERSONNEL TRAINING; PREPAREDNESS & PREVENTION; CONTINGENCY PLANS, OR OTHER GENERAL REQUIREMENTS.

Section _____ / Paragraph _____:

Section _____ / Paragraph _____:

Section _____ / Paragraph _____:

SWEPCO - PIRKEY S.E.

INDUSTRIAL SOLID WASTE

Compliance Monitoring Inspection Report
Surface Impoundments Checklist (TAC 335.281-.288) Class of Waste ( )

***

1. Are surface impoundments presently used to ~~treat or~~ store waste? Yes ✓ No___

   a. If yes, inspect the impoundments.

**2. Does the impoundment appear to maintain at least 2 feet (60 cm) of freeboard? Yes ✓ No___

**3. Check for evidence of overtopping of the dike. Is the facility compliant? Yes ✓ No___

**4. Check for evidence of seepage. Is the facility compliant? (THE POND HAS A CLAY LINER WHICH HAS BEEN SUBJECTED TO PH OF 1.53 S.U. FOR APPROXIMATELY 2 MOS. GROUNDWATER SEEPAGE MIGHT HAVE OCCURRED.) UNKNOWN Yes___ No___

5. Containment system for dyked or dammed impoundments (335.283)

   **a. Does the earthen dike have a protective cover (e.g. grass, shale, rock) to minimize wind and water erosion? Yes___ No ✓

6. What wastes are treated or stored in the impoundment? BOILER METAL CLEAN WASTES. THE COMPANY USED 5% HCL AND 0.25% AMMONIA BIFLUORIDE TO CLEAN THE BOILER APPROXIMATELY 2 MONTHS AGO.

7. Are waste analyses and trial tests conducted on these wastes (chemical processing of a different hazardous waste or method only)? N/A___ Yes___ No ✓

   a. If not, does the owner/operator have written documented information on similar treatment of similar wastes? Yes___ No ✓

8. Is this information retained in the operating record? N/A___ Yes___ No ✓

9. Is the impoundment inspected daily to check freeboard level? NO WRITTEN LOG HOWEVER. Yes ✓ No___

10. Is the impoundment, dikes and vegetation surrounding the dike inspected weekly to detect leaks, deterioration or failures? (NOT FOR GROUNDWATER LEAKS) Yes___ No ✓

TDWR-
Page 3 of 30 of Group II
*(Changed 9/10/82, response format realigned, other minor changes)
**See Note on Page 1
***This response column indicates noncompliance.

pg 4

***

11. Does the impoundment have a liner? Yes ✓ No___

a. If Yes, what type? CLAY LINER

b. If Yes, does it have a leachate collection and removal system? Yes___ No ✓

**12. Is there evidence of ignitable or reactive wastes placed in the impoundment? Yes___ No ✓

a. If Yes, explain in comments sheet [review 335.118(a)];
or
b. If Yes, is the impoundment used solely for emergencies? N/A Yes___ No___

**13. Is there evidence of incompatible wastes placed in the impoundment [if yes, review 335.118(b)]? Yes___ No ✓

14. Are monitor wells required for this site? (Refer to Rule 335.191-.195 - Ground Water Monitoring) Yes ✓ No___

a. Has owner/operator installed, operated and maintained a ground water monitoring system (unless waived) prior to 11/19/81? Yes___ No ✓

NOTE 1: Attach Ground Water Monitoring Report if answer to question 14 is yes.

15. Describe impoundment(s) site and indicate plat map, location(s) and designation(s). Also describe each impoundment's dimensions and capacity (acre-feet): THE METAL CLEANING POND IS 2.5 ACRES IN SIZE. ALTHOUGH NO MONITORING WELLS EXIST AROUND THIS IMPOUNDMENT, THE COMPANY CLAIMS THAT NO MONITORING

NOTE 2: If the answer is No for Nos. 5a, 7a, 8, 9, 10 and No. 14 after 11/19/81, explain in comments sheet.

WELLS HAVE BEEN PLACED AROUND THE PERIMETER OF THE PLANT SITE, HOWEVER, NONE OF THE WELLS HAVE BEEN MONITORED.

SEE ATTACHED PHOTOS.

*(Changed 9/10/82, response formal realigned)
**See Note on Page 1
***See Note Page 3

pg 12

East Texas Testing Laboratory Inc.

GEOTECHNICAL • MATERIALS • ENVIRONMENTAL

ENGINEERS • CHEMISTS • CONSULTANTS

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2012 North Timberland
Lufkin, Texas 75901
(713) 634-5777

Date 2/25/85

WATER ANALYSIS

Job No. 938-85

Report No. 2-1

Client: Texas Department of Water Resources, 2807 Hwy.42N, Kilgore, Tx.7566

Date Sampled: 2/25/85

Type of Sample: Grab By TDWR

Identification or Sample No.: 85-1527

Attn: Joe D. Woodard

ANALYSIS

ANALYSIS	RESULTS
pH	1.53 pH Units
Duplicate:	1.63 pH Units
QC:	
EPA WP 882-2	7.8/7.8
Lab Control	4.06/4.02

Respectfully Submitted:

EAST TEXAS TESTING LABORATORY, INC.

Toni Batton Murphy

Toni Batton Murphy, Assistant
Director of Analytical and
Environmental Services

TBM/cw

S.W. 35240
SWEPCO - PIRKE

INDUSTRIAL SOLID WASTE

PROBABLY II
UNKNO
NO REG

Compliance Monitoring Inspection Report
Surface Impoundments Checklist (TAC 335.281-.288)

Class of Waste (
***

1. Are surface impoundments presently used to ~~treat or~~ store waste? Yes ✓ No___

   a. If yes, inspect the impoundments.

**2. Does the impoundment appear to maintain at least 2 feet (60 cm) of freeboard? Yes ✓ No___

**3. Check for evidence of overtopping of the dike. Is the facility compliant? Yes ✓ No___

**4. Check for evidence of seepage. Is the facility compliant? Yes ✓ No___

5. Containment system for dyked or dammed impoundments (335.283)

   **a. Does the earthen dike have a protective cover (e.g. grass, shale, rock) to minimize wind and water erosion? Yes___ No ✓

6. What wastes are treated or stored in the impoundment? THIS CHECKLIST WILL SUFFICE FOR 5 PONDS: SURGE POND, LIGNITE RUNOFF BASIN, BOTTOM ASH BASINS NO 1 AND NO 2, AND A SECONDARY ASH POND. THEY ARE MOST LIKELY NON-HAZARDOUS.

7. Are waste analyses and trial tests conducted on these wastes (chemical processing of a different hazardous waste or method only)? N/A ✓ Yes___ No___

   a. If not, does the owner/operator have written documented information on similar treatment of similar wastes? Yes___ No___

8. Is this information retained in the operating record? N/A ✓ Yes___ No___

9. Is the impoundment inspected daily to check freeboard level? (DAILY VISITS - VISUAL INSPECTIONS) Yes ✓ No___

10. Is the impoundment, dikes and vegetation surrounding the dike inspected weekly to detect leaks, deterioration or failures? (VISUAL INSP'S) Yes ✓ No___

TDWR-
Page 3 of 30 of Group II
*(Changed 9/10/82, response format realigned, other minor changes)
**See Note on Page 1
***This response column indicates noncompliance.

pg 14

***

11. Does the impoundment have a liner? Yes ✓ No___

a. If Yes, what type? CLAY

b. If Yes, does it have a leachate collection and removal system? Yes___ No ✓

**12. Is there evidence of ignitable or reactive wastes placed in the impoundment? Yes___ No ✓

a. If Yes, explain in comments sheet [review 335.118(a)];
or
b. If Yes, is the impoundment used solely for emergencies? Yes___ No ✓ N/A

**13. Is there evidence of incompatible wastes placed in the impoundment [if yes, review 335.118(b)]? Yes___ No ✓

14. Are monitor wells required for this site? (Refer to Rule 335.191-.195 - Ground Water Monitoring) Yes___ No ✓

a. Has owner/operator installed, operated and maintained a ground water monitoring system (unless waived) prior to 11/19/81? COMPANY HAS INSTALLED 10 MONITORING WELLS AROUND PLANT SITE, BUT HAS NOT STARTED MONITORING. ✓ (SEE COMMENT) Yes___ No___

NOTE 1: Attach Ground Water Monitoring Report if answer to question 14 is yes.

15. Describe impoundment(s) site and indicate plat map, location(s) and designation(s). Also describe each impoundment's dimensions and capacity (acre-feet): SURGE POND = 4 ACRES, LIGNITE RUNOFF BASIN = 4.5 ACRES, BOTTOM ASH BASIN #1 = 2.9 ACRES, BOTTOM ASH BASIN #2 = 2.6 ACRES, SECONDARY ASH POND = 2.6 ACRES

NOTE 2: If the answer is No for Nos. 5a, 7a, 8, 9, 10 and No. 14 after 11/19/81, explain in comments sheet.

SWEPCO CONTENDS THAT THIS PONDS ARE REGULATED UNDER A WASTEWATER PERMIT AND SHOULD NOT BE INCLUDED IN A SOLID WASTE REGISTRATION (SEE ATTACHED CORRESPONDENCE). DISTRICT 5 THINKS THAT THE ASH PONDS AND ANY OTHER POND WHICH ACCUMULATES A SOLID WASTE SHOULD BE INCLUDED UNDER THE SOLID WASTE PROGRAM SINCE THESE WASTES WILL EVENTUALLY HAVE TO BE DISPOSED.

SWEPCO - PIRKEY S
SW REG. 33240

INDUSTRIAL SOLID WASTE

Compliance Monitoring Inspection Report
Landfills Checklist (Rule 335.341-.348)

No Reg - No Classifica
Class of Waste (___

***

1. Is run-on diverted from the landfill? (Effective November 19, 1981) Yes ✓ No___

2. Is run-off from the landfill collected? (Effective November 19, 1981) Yes ✓ No___

   a. Is this waste analyzed to determine if it is a hazardous waste? N/A___ Yes___ No ✓

      (1) If it is a hazardous waste, how is it managed? (Use narrative explanations sheet) THE COMPANY WAS ADVISE TO TEST THE COLLECTED RUN-OFF.

      (2) Is the collected run-off discharged through a point source to surface waters? Yes___ No ✓ THERE I: A DISCHAR. PIPE THRU. THE POND O. THE CO. WAS ADVISED NOT TO DISCHAR

         (a) If Yes, list WQ Permit Number _____

**3. Is the landfill managed so that wind dispersal is controlled? (Note: blowing debris) Yes ✓ No___

4. Do records indicate that reactive or ignitable wastes are placed in the landfill? Yes___ No ✓

   a. If Yes, is it treated, rendered or mixed before or immediately after placement in the landfill so it is no longer reactive or ignitable? N/A ✓ Yes___ No___

   b. Describe treatment, etc., or attach a copy of treatment. N/A

5. Do records indicate that incompatible wastes are placed in separate landfills? N/A Yes___ No___

6. Do records indicate that bulk or non-containerized liquid wastes or wastes containing free liquids are placed in the landfill? (Effective November 19, 1981) Yes___ No ✓

   a. If Yes, is the liquid waste treated chemically or physically, so no free liquids are present? N/A ✓ Yes___ No___

7. Do records indicate that containers holding liquid wastes are placed in the landfill? Yes___ No ✓

   a. If Yes, is the container designed to hold liquids for a use other than storage? (e.g. battery, capacitor) (Effective November 19, 1981) N/A Yes___ No___

TDWR-
Page 1 of 30 of Group II
*(Changed 9/10/82, added *** note and response columns realigned)
**Note checklist questions to be noted or completed during on-site inspection
***No in this response column indicates noncompliance; yes indicates use of questionable management practice(s).

***

8. Do the landfills have the following:

   a. A liner? Yes ✓ No___

   b. If Yes, what type? CLAY

   c. For each landfill indicate active or inactive status ACTIVE

   d. A leachate collection and removal system? Yes___ No ✓

      (1) If Yes, has leachate generation been detected? N/A Yes___ No___

      (2) If Yes, provide volumes and dates that leachate has been removed

      N/A

      (3) How is leachate disposed? N/A

9. Do records indicate that empty containers are placed in the landfill? Yes___ No ✓

   a. If Yes, are they reduced in volume (e.g. shredded, crushed)? (Effective November 19, 1981) N/A Yes___ No___

**10. Is there evidence of site instability? (e.g. erosion, settling)? No ✓ Yes___

**11. Is there evidence of ponding of water on-site? (POND USED TO COLLECT RUN-OFF) No___ Yes ✓

**12. Is there any indication of improper or inadequate drainage? No ✓ Yes___

13. Are monitor wells required for this site? (Refer to Rule 335.191-.195 - Ground Water Monitoring) UNKNOWN - DEPENDS UPON TDWR CLASSIFICATION OF WASTES Yes___ No___

   a. ~~If Yes,~~ has owner/operator installed, ~~operated~~ and maintained a ground water monitoring system (unless waived) prior to 11/19/81? Waived _____ Date Yes___ No ✓ (A GW MONITORING SYSTEM OF 10 W HAVE BEEN INSTALLED AROUND P SITE, BUT HAVE NOT BEEN MONITORED

14. Describe landfill(s) site and indicate sketch location(s) and designation(s). Also describe waste streams disposed in each landfill:

    SEE SKETCH ATTACHED TO GENERATORS/FACILITIES CHECKLIST.
    SEE ATTACHED SWEPCO TABLE 5-1 AND ATTACHED PHOTOS.

Note 1: Attach Ground Water Monitoring Report if answer to Question 13 is yes.

*(Changed 9/10/82, added *** note and columns realigned)
** See Note on Page 1

SWEDCO - PINKEY

INDUSTRIAL SOLID WASTE

Compliance Monitoring Inspection Report
Landfills Checklist (Rule 335.341-.348)

NO REGISTRATION — NOT CLASSIFIED — PROBABLY CLASS II
Class of Waste (____)
***

1. Is run-on diverted from the landfill? (Effective November 19, 1981) Yes ✓ No___

2. Is run-off from the landfill collected? (Effective November 19, 1981) Yes ✓ No___

   a. Is this waste analyzed to determine if it is a hazardous waste? — NOT HAZARDOUS N/A ✓ Yes___ No___

      (1) If it is a hazardous waste, how is it managed? (Use narrative explanations sheet) N/A

      (2) Is the collected run-off discharged through a point source to surface waters? Yes___ No___

         (a) If Yes, list WQ Permit Number _____

**3. Is the landfill managed so that wind dispersal is controlled? (Note: blowing debris) Yes ✓ No___

4. Do records indicate that reactive or ignitable wastes are placed in the landfill? Yes___ No ✓

   a. If Yes, is it treated, rendered or mixed before or immediately after placement in the landfill so it is no longer reactive or ignitable? N/A ✓ Yes___ No___

   b. Describe treatment, etc., or attach a copy of treatment.

5. Do records indicate that incompatible wastes are placed in separate landfills? N/A Yes___ No N/A

6. Do records indicate that bulk or non-containerized liquid wastes or wastes containing free liquids are placed in the landfill? (Effective November 19, 1981) Yes___ No ✓

   a. If Yes, is the liquid waste treated chemically or physically, so no free liquids are present? N/A ✓ Yes___ No___

7. Do records indicate that containers holding liquid wastes are placed in the landfill? Yes___ No ✓

   a. If Yes, is the container designed to hold liquids for a use other than storage? (e.g. battery, capacitor) (Effective November 19, 1981) N/A Yes___ No___

TDWR-
Page 1 of 30 of Group II
*(Changed 9/10/82, added *** note and response columns realigned)
**Note checklist questions to be noted or completed during on-site inspection
***No in this response column indicates noncompliance; yes indicates use of questionable management practice(s).

***

8. Do the landfills have the following:

   a. A liner? Yes ✓ No___

   b. If Yes, what type? CLAY

   c. For each landfill indicate active or inactive status ACTIVE

   d. A leachate collection and removal system? Yes___ No ✓

      (1) If Yes, has leachate generation been detected? N/A Yes___ No___

      (2) If Yes, provide volumes and dates that leachate has been removed

      N/A

      (3) How is leachate disposed? N/A

9. Do records indicate that empty containers are placed in the landfill? Yes ✓ No___

   a. If Yes, are they reduced in volume (e.g. shredded, crushed)? (Effective November 19, 1981) Yes ✓ No___

**10. Is there evidence of site instability? (e.g. erosion, settling)? No ✓ Yes___

**11. Is there evidence of ponding of water on-site? No ✓ Yes___

**12. Is there any indication of improper or inadequate drainage? No ✓ Yes___

13. Are monitor wells required for this site? (Refer to Rule 335.191-.195 - Ground Water Monitoring) Yes___ No ✓

   a. If Yes, has owner/operator installed, operated and maintained a ground water monitoring system (unless waived) prior to 11/19/81? Waived _____ (Date) N/A Yes___ No___

14. Describe landfill(s) site and indicate sketch location(s) and designation(s). Also describe waste streams disposed in each landfill:

    100' x 30' x 10' — CONSTRUCTION DEBRIS. PLANT TRASH.

Note 1: Attach Ground Water Monitoring Report if answer to Question 13 is yes.

*(Changed 9/10/82, added *** note and columns realigned)
**See Note on Page 1

DATE SUBMIT: 0385 | N

FACILITY STATUS SHEET

[illegible] 03/011/85

EPA ID: TXD000726380 (9–20) TDWR Rec./Reg: 33240 (22–26) District: 05 (28–29) Fin. Assur. Reqs.: CPSN (31–34) (AT THE TIME OF THIS INSP)

Facility Name: SWEPCO PIRKEY STEAM ELECT STA (36–64) Facility Address: PO BOX 33 HALLSVILLE TEX 75650 (66–95)

A1 Entry Type: [X] New [ ] Update A2 Facility Type: [X] Major [ ] Non-Major

[ ] 90-day Exemption [ ] Sm. Quantity Exemption

7. GROUND WATER MONITORING STATUS: [ ] NA [X] No GWM Begun [ ] Waiver (add GWM pg) [X] Detection (add GWM pg) [ ] Assessment (add GWM pg)

8. Activities Subject to Closure/Post Closure: [ ] Landfill [X] Surface Impoundment [ ] Land Treatment/Application [ ] Incinerator [ ] Waste Pile [ ] Other (specify)

9. X 01 CLOSURE PLAN:	9A. [ ] NA [ ] NE EVAL-02/21/85	9B. OK?N (Y,N)	9C. NO PLAN	Indicate Problem: (No Plan, Deficiency)
10. CLOSURE COST-ESTIMATE	10A. [ ] NA [ ] NE EVAL 02/21/85	10B. OK?N (Y,N)	10C. AMT-$ REV. AMT-$	
X 02 CLOS. INST-N	EVAL- / /	OK?N	NO INST	

T=Trust Fund S=Surety Bond P=Performance Bond L=Letter of Credit I=Insurance F=Financial Test K=Corporate Guarantee N=None

AMT-$ EFFEC- / / RENEW- / /

03 CARRIER-

12. X 04 P CLOS. PLAN.	12A. [ ] NA [ ] NE EVAL-02/21/85	12B. OK?N (Y,N)	12C. NO PLAN	Indicate Problem: (No Plan, Deficiency)
13. POST CLOSURE COST ESTIMATE	13A. [ ] NA [ ] NE EVAL 02/21/85	13B. OK?N (Y,N)	13C. AMT-$ REV. AMT-$	

SWEPCO 33240-

*05 P CLO INST- N EVAL- / / OK? N NO INST

T=Trust Fund S=Surety Bond P=Performance Bond L=Letter of Credit I=Insurance F=Financial Test K=Corporate Guarantee N=None

14D AMT- $ EFFEC- / / RENEW- / /

14F 06 CARRIER-

*07 SUD INST- N EVAL- / / OK? N NO INST

AMT- $ / EFFEC- / / RENEW- / /

08 CARRIER-

*09 N-SUD INST- EVAL- / / OK? N NO INST

AMT- $ / EFFEC- / / RENEW- / /

10 CARRIER-

17A. Closure Process Begun? ☒ No Date / /
B. With approved plan and required procedures? ☐ Yes ☐ No
C. Certifications received? ☐ No Date / /
D. Closure assurance and liability release? ☐ NA ☐ No Date / /

18A. Post-Closure Process Begun? ☐ NA ☒ No Date / /
B. With approved plan and required procedures? ☐ Yes ☐ No
C. Survey Plat/Record of waste received? ☐ No Date / /
D. Post-Closure period completed? ☐ No Date / /
E. Post-Closure assurance release? ☐ NA ☐ No Date / /

19. A. Post-Bond [illegible] ☒ No [illegible] N/A

20. Comments [illegible]

DWR-0002

SWEPCO
33240

FACILITY STATUS SHEET
GROUNDWATER MONITORING PAGE

	Evaluated?	Adequate?	
2. Groundwater Monitoring Well System:	2A. ☐ NA ☐ NE 02/21/85 M D Y	2B. ☐ Yes ☒ No	
3. Groundwater Sampling, Analysis and Evaluation Program:	3A. ☐ NA ☐ NE 02/21/85 M D Y	3B. ☐ Yes ☒ No	
4. Notice of Significant Increase in Parameter Concentrations:			4A. Submitted? ☐ NA ☒ NO ___/___/___ M D Y
5. Groundwater Quality Assessment Report:			5A. Submitted? ☐ NA ☒ NO ___/___/___ M D Y
	5B. ☐ NA ☐ NE ___/___/___ M D Y	5C. ☐ Yes ☐ No	5D. Showed hazardous constituents in groundwater? ☐ Yes ☐ No
6. Waiver Demonstration:	6A. ☒ NA ☐ NE ___/___/___ M D Y	6B. ☐ Yes ☐ No	
7. Groundwater Monitoring Records:	7A. ☐ NA ☐ NE 02/21/85 M D Y	7B. ☐ Yes ☒ No	

COMMENTS: THERE IS NO GROUND WATER MONITORING AROUND THE SURFACE IMPOUNDMENT WHICH WAS FOUND TO BE HAZARDOUS BECAUSE OF 1.53 S.U. pH (METAL CLEANING WASTE). SWEPCO STATES THAT 10 G.W. MONITORING WELLS HAVE BEEN INSTALLED AROUND THE PLANT SITE, BUT HAVE NEVER BEEN TESTED.

TEXAS DEPARTMENT OF WATER RESOURCES

HAZARDOUS WASTE COMPLIANCE MONITORING AND ENFORCEMENT LOG

☒ NEW ☐ UPDATE

**0285
Rcd 3-11-85

TDWR ID: 33240 (2–6) 1. EPA ID: TXD007263350 (8–19) INDUSTRY: SWEPCO (21–28) DISTRICT: 05 (30 31)

2. INDUSTRY NAME: SWEPCO - PIRKEY STEAM ELECTRIC STATION PHONE: (214) 935-3181

3. SITE ADDRESS: EAST OF HALLSVILLE AND SOUTH OF IH-20. ZIP: 75650 COUNTY: HARRISON (102)

7. DATE SUBT: 03-15-85 (33 34 / 35 36) (CENTRAL OFFICE USE ONLY)

FACILITY: GF (G,F,T, 1,2,3) (38 40)

4. MAJOR/NONMAJOR: N (42)

6. TYPE OF EVALUATION: EV (44 45) (CEI-EV, EC; CME-GW; OTHER-CL, SW; SAMPLE-SA; FOLLOW UP-FO; RECORD REVIEW-RC, RF; FOR HIGH PRIORITY PLACE H IN 1ST BLOCK)

5. DATE OF INITIAL EVALUATION: 02-21-85 (47 54)

RESPONSIBLE AGENCY: S

AREA AND CLASS OF VIOLATION (INCLUDES DISTRICT LEVEL ENFORCEMENT ACTIONS)

	Eval	Deg	Date Notice of Violation	Date Conference	Date Refer. to Austin for Enf.	Date High Prior. Determination	Date of Estim. Compliance	Date Response is Due for Nov.	Date of Actual Compliance	Resolv/Unres/ Complaint
GW	X	1			03-05-85					U
CL	X	1			03-05-85					U
PT					03-05-85					U
MA										
FI	X	1			03-05-85					U
S										
OT	X	1			03-05-85					U

COMMENTS: (COUNTY)

01	102	006	0	U	117	2	U	131	1	U	151	1	U	114	1	U	116						
1	U	223	1	U	281	1	U	191	1	U													

02 2* sites; SW Rec 33240 HAS NOT BEEN ISSUED. SURFACE IMPOUNDMENT WITH H.W. (LISTED UNDER 453 w.o. RH). RH in process of review.

WORK NO: 9091 NO. OF SAMPLES: 1 SUBMITTED BY: Jack Wordsdale

TDWR 0[illegible]1 (Rev 10 12 84)

3324° 9

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

TELEPHONE MEMO TO THE FILE

Call To: Jay Pruett Swepco Call From: David Buchanan

Date of Call: 4-17-85 File No:

Subject of Call: Closure plan for hazardous waste surface impoundment and enforcement disposition.

Information for File: Mr. Pruett was informed that use of the surface impoundment for storing the metal cleaning solution (pH<2) made it a hazardous waste facility. This impoundment does not have interim status or a permit. Mr Pruett said the company wanted to remove the facility from consideration as a hazardous waste impoundment by disposing of the water. I told Mr. Pruett a closure plan should be submitted to address treatment and disposal of the liquid waste; documentation that any accumulated sludges were adequately neutralized and samples for verification that the acidic waste had not migrated through the liner nor compromised its structural integrity. Before any work is initiated Mr Pruett must submit the plan and receive approval. The plan must state that any discharge from the impoundment will meet the discharge parameters specified in their permit. Mr. Pruett assured me there were no other constituents of concern that might require additional testing. The closure plan will be submitted within three weeks.

CC - A-5

Signed: David Buchanan

SWEPCO

Memorandum of
Telephone Conversation

Haz Waste
13

From:		To:	
Name Jay Pruett	Title	Name Joe Woodard	Title
Organization	Phone No.	Organization TDWR	Phone No. 214/ 984-0636
Location		Location Kilgore	

Date 6-28-85 Time 3:00

Subject Notification of Dewatering of Acid Pit

Notes: Per TDWR letter of June 25, 1985 I was providing notification to the Kilgore District TDWR office that we plan to begin dewatering of the acid cleaning waste pond as an initial step in closure of the "hazardous waste" facility. Joe was out in, but the secretary said she would advise him.

Signed: Jay A. Pruett

SWEPCO

Memorandum of
Telephone Conversation

15

From:		To:	
Name Joe Woodard	Title Field Representative	Name Brian Bond	Title Env Specialist
Organization Texas Water Commission Solid Waste	Phone No. 214-984-0636	Organization Environmental	Phone No. 221-2604
Location Kilgore, Tx		Location Shreveport, La.	

Date 11/1/85 Time 1:40 p.m

Subject Postponement of Metal Cleaning waste Pond (Pi-Key)

Notes: Joe Woodard returned my call and I informed him that sampling of the metal Cleaning waste pond (11/5/85) would have to be postponed until the pond was dewatered again due to rain. He said to write TWC another letter notifying them of day when we rescheduled sampling.

Signed: Brian Bond

EPCO

Memorandum of
Telephone Conversation

17

From:		To:	
Name Brian Bond	Title Env. Specialist	Name Joe Woodard	Title Field Representative
Organization Swepco - Env	Phone No. 221-2604	Organization TWC	Phone No. 214-984-0636
Location Shreveport, La.		Location Kilgore, Texas	

Date 12/2/85 Time 11:45 A.M.

Subject Small Quantity Generator Status - 30 gallons Metal Cleaning Waste Pond - Pirkey

Notes:

I called Joe Woodard to let him know that it would be a while before sampling was performed on the metal cleaning waste pond at Pirkey due to excessive rains and runoff into this pond. I told him we would give him notice prior to sampling and he said this was O.K.

Joe said we could maintain less than 30 gallons of Safety-Kleen Wa and continue as we have been but if we collected over 30 gallons we would be subject to 90 day storage exemption. This would involve maintaining personnel training in dealing with Hazardous Waste, much paperwork, maintaining a spill plan, and having to designate with marked drums the Hazardous material. This training of personnel fell under 335.117 of Texas Administrative Code. If we store in drums under 90 days we would be required to date waste drums. If we store on site more than 90 days of 30 gallons or more we would be subjected to regulations requiring us to permit such facility as a Hazardous Waste Storage Facility.

Signed: Brian Bond

DWD550 TEXAS WATER COMMISSION 03-05-86
NOTICE OF REGISTRATION
INDUSTRIAL SOLID WASTE GENERATION/DISPOSAL

THIS IS NOT A PERMIT AND DOES NOT CONSTITUTE AUTHORIZATION OF ANY WASTE MANAGEMENT ACTIVITIES OR FACILITIES LISTED BELOW. REQUIREMENTS FOR SOLID WASTE MANAGEMENT ARE PROVIDED BY TEXAS ADMINISTRATIVE CODE SECTION 335 OF THE RULES OF THE TEXAS WATER COMMISSION (TWC). CHANGES OR ADDITIONS TO WASTE MANAGEMENT METHODS REFERRED TO IN THIS NOTICE REQUIRE WRITTEN NOTIFICATION TO THE TWC.

DATE OF NOTICE: 02-28-86 REGISTRATION DATE: 08-30-85

REGISTRATION NUMBER: 33240 EPA I.D. NUMBER: TXD000726380

THE REGISTRATION NUMBER PROVIDES ACCESS TO STORED INFORMATION PERTAINING TO YOUR OPERATION. PLEASE REFER TO THAT NUMBER IN ANY CORRESPONDENCE.

COMPANY NAME: SOUTHWESTERN ELECTRIC POWER CO
PO BOX 21106
SHREVEPORT LA 71156
GENERATING SITE LOCATION:
H.W. PIRKEY POWER PLANT HALLSVILLE TEXAS
CONTACT PERSON: MR JAY A PRUETT
PHONE: (318) 221-2604
NUMBER OF EMPLOYEES: GREATER THAN 100
TWC DISTRICT: 05

REGISTRATION STATUS: ACTIVE
REGISTRATION TYPE: GENERATOR
HAZARDOUS WASTE STATUS: SMALL QUANTITY GENERATOR

I. WASTE GENERATED:

WASTE NUMBER	DESCRIPTION	CLASS	CODE	DISPOSITION
001	OIL, LUBRICATING	I	110490	ON-SITE/OFF-SITE
002	SOLVENTS, SPENT	IH	910100	ON-SITE/OFF-SITE
	EPA HAZARDOUS WASTE NOS. (REFER TO 40 CFR PART 261 FOR DESCRIPTIONS): D001			
003	PLANT REFUSE, GENERAL MISC.	II	279760	ON-SITE
004	ASH, FLY	I	171380	ON-SITE
005	FGD SCRUBBER SLUDGE	I	141580	ON-SITE

REGISTRATION NUMBER: 33240
COMPANY NAME: SOUTHWESTERN ELECTRIC POWER CO

006	WASTEWATER TREATMENT SLUDGE	I	149000	ON-SITE
007	ASH, BOTTOM	I	172570	ON-SITE

II. SHIPPING/REPORTING: PURSUANT TO TEXAS ADMINISTRATIVE CODE SECTION 335 OF THE RULES OF THE TWC PERTAINING TO INDUSTRIAL SOLID WASTE MANAGEMENT, ISSUANCE OF MANIFESTS AND MONTHLY REPORTING ARE REQUIRED FOR OFF-SITE STORAGE/PROCESSING/DISPOSAL OF THE FOLLOWING CLASS I WASTES LISTED IN PART I.

PREPARE A MONTHLY WASTE SHIPMENT SUMMARY AND SUBMIT IT ALONG WITH THE GREEN COPY OF THE MANIFEST(S) FOR EACH MONTH THAT SHIPMENTS OF THE FOLLOWING WASTE(S) ARE MADE. NO MONTHLY WASTE SHIPMENT SUMMARY IS REQUIRED FOR MONTHS WHEN SHIPMENTS ARE NOT MADE.

001 110490 OIL, LUBRICATING

002 910100 SOLVENTS, SPENT

III. ON-SITE WASTE MANAGEMENT FACILITIES:

FAC NO.	FACILITY	STATUS
01	CONTAINER STORAGE AREA STORAGE OF WASTE NUMBER(S) 001, 002 CONTAINER STORAGE BUILDING	ACTIVE
02	LANDFILL DISPOSAL OF WASTE NUMBER(S) 003 PLANT REFUSE LANDFILL	ACTIVE
03	LANDFILL DISPOSAL OF WASTE NUMBER(S) 004, 005, 006, 007 1.3X107 CY FLY ASH/FGD SLUDGE/WASTEWATER SOLIDS/BOTTOM ASH LANDFILL	ACTIVE

UNLESS OTHERWISE STATED ABOVE, FACILITIES ARE LOCATED
AT H.W. PIRKEY POWER PLANT HALLSVILLE TEXAS
COUNTY OF HARRISON

IV. RECORDS.

A. FOR PURPOSES OF FILING ANNUAL REPORTS PURSUANT TO TEXAS ADMINISTRATIVE CODE SECTION 335 OF THE RULES OF THE TWC PERTAINING TO INDUSTRIAL SOLID WASTE MANAGEMENT, RECORDS SHOULD BE MAINTAINED FOR STORAGE, PROCESSING AND/OR DISPOSAL OF THE FOLLOWING WASTE(S) LISTED IN PART I:

001 110490 OIL, LUBRICATING

002 910100 SOLVENTS, SPENT

003 279760 PLANT REFUSE, GENERAL MISC.

004 171380 ASH, FLY

005 141580 FGD SCRUBBER SLUDGE

006 149000 WASTEWATER TREATMENT SLUDGE

007 172570 ASH, BOTTOM

Southwestern Electric Power Company
P. O. BOX 21106 · SHREVEPORT, LOUISIANA 71156

20

March 10, 1986

Permit Section
Hazardous and Solid Waste Division
Texas Water Commission
P. O. Box 13087, Capitol Station
Austin, Texas 78711

Re: "Affidavit of Exclusion from Hazardous Waste Permitting Requirement"
Registration No. 33240

Dear Sir:

Enclosed is a completed "Affidavit of Exclusion from Hazardous Waste Permitting Requirement" for Southwestern Electric Power Company's H. W. Pirkey Power Plant. This facility qualifies for the "Accumulation Time" storage exclusion, "Small Quantity Generator" exclusion and the "Elementary Neutralization Unit" exclusion as set forth in the Texas Administrative Code. The submittal of this "Affidavit of Exclusion" was requested by Mr. Kevin Phillips, TWC Field Representative, District V, as a result of a solid waste inspection conducted at this facility on February 19, 1986.

Please contact me should you require additional information.

Sincerely,

Brian Bond

Brian Bond
Environmental Specialist

BB/db
Enclosure
xc: Mr. Kevin Phillips, TWC District V, w
Mr. J. A. Pruett, w/o
Mr. Mike Williams, w
File, w

AFFIDAVIT OF EXCLUSION FROM HAZARDOUS WASTE PERMITTING REQUIREMENT

Registration No. 33240

Application No. _____
(Dept. Use Only)

Facility Name Pirkey Power Plant

County of Harrison

Leslie E. Dillahunty being duly sworn, deposes and says:

I am Vice President, Superintendent of Power of Southwestern Electric Power Co.
Title (Owner or Principal Officer) Facility Owner
P. O. Box 21106, Shreveport, LA 71156 .
and Address

This affidavit is being executed for the purpose of notifying the Executive Director of the Texas Department of Water Resources that the named facility does not require a hazardous waste permit because:

Check appropriate box(es):

- [ ] No hazardous waste is stored, processed or disposed on-site
- [X] The facility qualifies for the "Accumulation Time" storage exclusion of Texas Administrative Code, Section 335.69
- [X] The facility qualifies for the "Small Quantity Generator" exclusion of Texas Administrative Code, Section 335.2(e)
- [X] The facility qualifies for the "Elementary Neutralization Unit" exclusion of Texas Administrative Code, Section 335.2(f)
- [ ] The facility qualifies for the "Wastewater Treatment Unit" exclusion of Texas Administrative Code, Section 335.2(f)
- [ ] Other (Explain with an attachment and reference TDWR rule)

Leslie E. Dillahunty
Signature

Sworn to before me this 7th day of March, 1986.

Inez W. Harwell
Notary Public in and for
Caddo Parish County, La.

My commission expires

INEZ W. HARWELL, Notary Public
Caddo Parish, Louisiana
My Commision is for Life

Solid waste

21

SWEPCO

Memorandum of Telephone Conversation

FROM:		TO:	
NAME	TITLE	NAME	TITLE
Jay Pruett		Kevin Phillips	Inspector
ORGANIZATION	PHONE	ORGANIZATION	PHONE
		TWC District 5	214-984-0636
LOCATION		LOCATION	
		Kilgore	

DATE 4-10-86 TIME 3:45 P.M.

SUBJECT Disposal of Cleanup Debris - Pirkey Power Plant

I called Kevin to ask what acceptable means of disposal were available for the grease-contaminated dirt cleaned up at the Pirkey unregistered container storage area. I explained that this waste had been placed into a barrel and we now needed to dispose of it.

Kevin said that we could place the barrel full of cleaned up dirt and grease into our plant refuse landfill cell. I asked if this was acceptable to TWC to place this uncrushed barrel full of cleanup debris into the landfill. Kevin said yes. I told him we would proceed accordingly.

Signed Jay A. Pruett

Pirkey - Two Solid waste Regis

22

Southwestern Electric Power Company
P. O. BOX 21106 · SHREVEPORT, LOUISIANA 71156

April 11, 1986

Mr. John Witherspoon, Manager
District 5
Texas Water Commission
2807 Highway 42 North
Kilgore, Texas 75662

Re: Disposition of Unregistered Container Storage Area
H. W. Pirkey Power Plant
Solid Waste Registration #33240

Dear Mr. Witherspoon:

This letter is to provide you with information regarding the disposition of the unregistered container storage area located adjacent to the plant refuse landfill at the H. W. Pirkey Power Plant. This letter is intended as a followup to our letter of March 25, 1986.

As agreed between our Mr. Brian Bond and your Mr. Kevin Phillips, we have tested several of the barrels containing waste oil at this unregistered container storage area for EP Toxicity (metals) and ignitability (flash point). The results of the testing are attached for your information. These results indicate that each of the randomly selected waste oil samples passed the EP Toxicity test and the ignitability test and therefore indicate that the waste oil is not hazardous. In addition, Sample No. 40 was taken from the barrel containing grease, some of which had spilled onto the ground. These test results again indicate that the grease was not hazardous.

We have therefore provided the following disposition for materials stored at the unregistered container storage area:

Hazardous Wastes

- Approximately 4 barrels contained varsol solvent. This varsol was determined to be useable and has been taken back to the plant for use in normal plant solvent cleaning operations. It is therefore not a waste at this time.

Non-Hazardous Wastes

- Approximately 100 barrels were empty. These barrels have either been crushed and placed in the open plant refuse landfill cell or crushed to be sold for scrap metal. Some

of the barrels were taken by plant employees who wished to have them for personal use. Approximately 30 barrels contained accumulated rainwater only. These barrels were emptied into the plant's wastewater oil skimmer pit in the event that they contained any small quantities of waste oil. The empty barrels were then disposed of as described above.

- Approximately 15 barrels contained waste oil. This oil was sold to a local waste oil reclaiming firm in accordance with solid waste regulations.

- The one barrel of non-hazardous electric motor grease was placed into storage in the registered container storage area for disposal or reuse.

- The one to two barrels of dirt contaminated with grease cleaned up around the grease barrel was placed in the plant refuse landfill cell, per our agreement with your Mr. Kevin Phillips.

All barrels have been removed from the unregistered container storage area in accordance with the above information. All future storage of barrels containing hazardous or non-hazardous waste will be done in the registered container storage area only.

If you require any additional information with regard to this matter, do not hesitate to give me a call. We have taken additional steps at the plant to assure that a similar type of unauthorized disposal does not take place again in the future. It is our intention to comply with all requirements of the solid and hazardous waste rules and regulations and our solid waste registration at the H. W. Pirkey Power Plant.

Sincerely,

Jay A. Pruett

Jay A. Pruett

JAP/db
Enclosure
xc: Mr. R. T. Whetstone, w
Mr. Mike Williams, w
Mr. Brian Bond, w
File, w

Waste Oil Samples

Unregistered Container Storage Area

H. W. Pirkey Power Plant

Received March 5,1986

	Waste Oil (Barrel Number)						Spilled Grease	LIMITS
E P TOXICITY(ppm)	# 2	# 14	# 15	# 24	# 25	# 35	# 40	
ARSENIC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	5
BARIUM	<1	<1	4	<1	<1	6	<1	100
CADMIUM	<0.01	0.02	0.05	<0.01	<0.01	<0.01	<0.01	1
CHROMIUM	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	5
LEAD	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	5
MERCURY	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.2
SELENIUM	0.005	<0.001	0.011	0.005	0.009	<0.001	<0.001	1
SILVER	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	5
FLASH POINT °F	395	435	370	*	410	330	>245	140(min.)

* FLASH POINT COULD NOT BE DETERMINED DUE TO EXCESS WATER.

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Southwestern Electric Power Company

P. O. BOX 21106 SHREVEPORT, LOUISIANA 71156

May 17, 1985

No Δ.
JKB

Mr. Cesar Farias
Waste Disposition Control Unit
Solid Waste Section
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Re: Modification to Solid Waste
Registration - No. 33240
H. W. Pirkey Power Plant

Dear Mr. Farias:

This letter is a request from Southwestern Electric Power Company for modification of the above referenced Solid Waste Registration to combine two of its registered solid wastes, waste oil and varsol, for the purpose of reclassification.

Currently waste oil is classified as Class I Nonhazardous; Waste Code - 110450; Disposition - On Site/Off Site. Varsol is classified as Class I Hazardous; Waste Code - 914290; Disposition - On-Site/Sold for Recovery/Secondary Use. Varsol is a hydrocarbon distillate solvent used at the facility for equipment cleaning purposes. The resultant varsol waste is not a listed hazardous waste; however, due to its flashpoint of less than 140 degrees Fahrenheit, if it is considered hazardous due to its ignitability characteristic.

Waste oil and varsol can be mixed in proper proportions to ensure flashpoints greater than 140 degrees Fahrenheit, resulting in a mixture of nonhazardous waste. This waste oil/varsol combination therefore could be classified as one Class I Nonhazardous waste possessing one waste number, which can then be sold to a waste oil recycler.

Do not intend to get permitted
No longer interested. JKB

Please advise if you require any additional information regarding this modification. Due to an increase in maintenance activities with which these wastes are associated, your expedious review is requested.

Sincerely,

Jay Worley
Environmental Specialist

JW/db
xc: Mr. J. A. Pruett
Texas Department of Water Resources District V

REFERENCE 7

ISU 3240 11/80-
HENRY W PIRKEY PWR PLT

33240

Southwestern Electric Power Company
P. O. BOX 21106 · SHREVEPORT, LOUISIANA 71156

November 17, 1987

RECEIVED
DEC 17 1987
FIELD OPERATIONS

Mr. Allan M. Seils, Head
Technical Support Unit
Hazardous and Solid Waste Division
Texas Water Commission
P. O. Box 13087, Capitol Station
Austin, TX 78711

Re: Solid Waste Registration No. 33240
H. W. Pirkey Power Plant

Dear Mr. Seils:

Due to the July 14, 1987 revision to the definition of "Solid Waste" included in 31 TAC 335.1 and pursuant to 31 TAC 335.6(c), Southwestern Electric Power Company is respectfully submitting the following information for your agency's review and requesting that Solid Waste Registration No. 33240 be modified to reflect the updated waste management practices indicated for H. W. Pirkey Power Plant.

1) Waste Numbers 008, 009 and 010 generated at Pirkey Power Plant will be stored on-site in Facility No. 01 (Container Storage Area) prior to off-site shipment. Please reflect this in "Section III. On-Site Waste Management Facilities". These wastes were added to Registration No. 33240 on June 30, 1987; however, no Facility Number indicating the storage location of these wastes was added at that time.

2) Ash transport water at Pirkey is recirculated via pumps from the secondary ash pond to the plant boiler where bottom ash is removed and sluiced to the two bottom ash ponds for settling. A chemical analysis of typical bottom ash was submitted to TWC on April 2, 1985 with the "Industrial Solid Waste Management Inventory" for this facility. I am requesting that Ash Transport Wastewater be added to Registration No. 33240 as Waste Number 011; Ash Transport Wastewater; Class INH; Add Appropriate Waste Code; Disposition - On-Site. Please indicate on

106530 p8

L

3212 RUJB(2) SPG

Registration No. 33240 that this wastewater is stored in Facility Number 06; Surface Impoundment; Storage of Waste Number 011; 3 Pond System for Ash Transport Wastewater.

106870 P8

3) Limestone Runoff Wastewater is generated at Pirkey during storm events, when rainfall that has come into contact with limestone (used in flue gas desulfurization process as a raw material) is directed to the limestone runoff basin. This material storage runoff is retained until discharged as permitted by EPA and TWC wastewater permits. Limestone Runoff Wastewater is made up of rainfall that has dissolved small amounts of $CaCO_3$ away from the limestone pile. Please add Limestone Runoff Wastewater to Registration No. 33240 as Waste Number 012; Limestone Runoff Wastewater; Class INH; Add Appropriate Waste Code; Disposition - On-Site. This wastewater is stored in Facility No. 07; Surface Impoundment; Storage of Waste Number 012; Limestone Runoff Basin.

same as above code

4) Lignite-Runoff Wastewater is generated at Pirkey during storm events, when rainfall that has come into contact with the lignite storage pile is directed to the lignite runoff basin. This material storage runoff is retained until discharged as permitted by EPA and TWC wastewater permits. Lignite Runoff Wastewater is made up of rainfall that leaches minute amounts of constituents of the lignite. A typical analysis of lignite burned at Pirkey has been enclosed for your review. Please add Lignite Runoff Wastewater to Registration No. 33240 as Waste Number 013, Lignite Runoff Wastewater; Class INH; Add Appropriate Waste Code; Disposition - On-Site. This wastewater is stored in Facility No. 08; Surface Impoundment; Storage of Waste Number 013; Lignite Runoff Basin.

5) Metal Cleaning Wastewater is generated at Pirkey as the result of periodic chemical cleanings of the boiler and periodic air preheater washes that are performed at this facility. A waste analysis from the "Citrosolv" cleaning method has been enclosed for your review. Please note that the wastewater generated from this method is also non-hazardous. Periodic air preheater washes are performed at Pirkey generating a waste composed primarily of cooling reservoir water contaminated with small

100250 pg

amounts of fly ash. A typical chemical analysis of fly ash was submitted to your agency on April 2, 1985 with the "Industrial Solid Waste Management Inventory" submitted for Pirkey. The discharge of metal cleaning wastewater is permitted by EPA and TWC wastewater permits. Please add Metal Cleaning Wastewater to Registration No. 33240 as Waste Number 014; Metal Cleaning Wastewater; Class INH; Add Appropriate Waste Code; Disposition - On-Site. This wastewater is stored in Facility No. 09; Surface Impoundment; Storage of Waste Number 014; Metal Cleaning Waste Pond.

108880 pg

6) Landfill Detention Pond Wastewater is generated at Pirkey during storm events, when rainfall that has come into contact with FGD Scrubber Sludge is directed to the Landfill Detention Pond. This wastewater is retained until discharged as permitted by EPA and TWC wastewater permits and is composed of rainfall that has dissolved small amounts of non-hazardous chemicals from the FGD Scrubber Sludge. The constituents of FGD Scrubber Sludge were submitted on April 2, 1985 with the "Industrial Solid Waste Management Inventory" submitted for Pirkey. Please add Landfill Detention Pond Wastewater to Registration No. 33240 as Waste Number 015; Landfill Detention Pond Wastewater; Class INH; Add Appropriate Waste Code; Disposition - On-Site. This wastewater is stored in Facility No. 010; Surface Impoundment; Storage of Waste Number 015; Landfill Detention Pond.

104980 pg

7) Demineralizer Regenerant Wastewaters are frequently generated at Pirkey. This wastewater is either neutralized in line via a neutralization tank system prior to being discharged as permitted by EPA and TWC wastewater permits or is discharged unneutralized into the ash pond system as permitted by the Dietrich Letter Exemption. Please add Demineralizer Regenerant Wastewater to Registration No. 33240 as Waste Number 016; Demineralizer Regenerant Wastewater; Class I; Add Appropriate Waste Code; Disposition - On-Site. This wastewater is either stored in Facility No. 011; Neutralization Tanks; storage of Waste Number 016; Neutralization Tanks or stored in Facility No. 06 listed previously in this letter.

112910
pg

8) Waste lubricating greases are periodically generated at Pirkey as the result of maintenance activities performed on plant equipment. Based on EP Toxicity analyses that have been performed on these greases, the results which have been attached for your review and based on information contained in the attached Material Safety Data Sheets for these greases please add waste greases to Registration No. 33240 as Waste Number 017; Waste Grease; Class INH; Add Appropriate Waste Code; Disposition - On-~~Site/Off~~-Site. Please indicate that the waste greases are stored in Facility Number 01 (Container Storage Area) prior to off-site shipment.

Please review the enclosed information, and if appropriate, ensure that the above requested modifications are made to Solid Waste Registration No. 33240. Please contact me at the above address or telephone me at (318)221-2604, Ext. 252 should you have any questions or require any additional information regarding this matter. Your assistance in this process is appreciated.

Sincerely,

Brian Bond

Brian Bond
Environmental Specialist

BB/db
Enclosure
xc: Mr. J. A. Pruett, w/o
Mr. R. T. Whetstone, w/o
Mr. Mike Williams, w/o
Mr. Arne Melson, w
Mr. Bobby Welch, w/o
TWC - District 5 Office, w
File, w

UNIREX N-2

SOUTHWESTERN ELECTRIC POWER COMPANY
Water Quality Analysis Results

Project E. P. Toxicity (Pirkey) Date/Time Collected 1-30-87

Water Body Location Grease, C. Oil House

pH/25°C (standard units)	Sulfate as SO_4^{---}			Copper	<0.05/<0.05
Color (units)	Chloride as Cl^-			Iron	
Specific Conductance (Mmhos/cm)	Fluoride as F^-			Lead	<0.05
Turbidity (NTU)	Oil and Grease			Magnesium, as $CaCO_3$	
Acidity, total as $CaCO_3$	Silica			Manganese	
Alkalinity, total as $CaCO_3$	Fecal Coliform (No./100ml)			Mercury	<0.001
Hardness, total as $CaCO_3$	Carbonate as $CaCo_3$			Molybdenum	
Total Suspended Solids	Bicarbonate as $CaCO_3$			Nickel	<0.05/<0.05
Total Dissolved Solids				Potassium	
Total Residue	Aluminum			Selenium	<0.005
Biochemical Oxygen Demand$_5$	Antimony			Silver	<0.05
Chemical Oxygen Demand	Arsenic	<0.01		Sodium	
Nitrogen, Ammonia as N	Barium	<0.1		Strontium	
Nitrogen, Nitrite as N	Beryllium			Titanium	
Nitrogen, Nitrate as N	Boron			Vanadium	<0.2
Nitrogen, Organic	Cadmium	<0.01		Zinc	3.7
Phosphate, total as P	Calcium, as $CaCO_3$				
Phosphate, Ortho as P (Filterable)	Chromium	<0.05			

*All values reported as mg/l (ppm) unless otherwise indicated

Analyzed by Vicki G. McEachern

UNIREX N-2

SOUTHWESTERN ELECTRIC POWER COMPANY
Water Quality Analysis Results

Project E. P. Toxicity (Pirkey) Date/Time Collected 1-30-87

Water Body Location Grease, D. Oil House

pH/25°C (standard units)	Sulfate as SO_4^{---}		Copper	0.06
Color (units)	Chloride as Cl^-		Iron	
Specific Conductance (Mmhos/cm)	Fluoride as F^-		Lead	<0.05
Turbidity (NTU)	Oil and Grease		Magnesium, as $CaCO_3$	
Acidity, total as $CaCO_3$	Silica		Manganese	
Alkalinity, total as $CaCO_3$	Fecal Coliform (No./100ml)		Mercury	< 0.001
Hardness, total as $CaCO_3$	Carbonate as $CaCo_3$		Molybdenum	
Total Suspended Solids	Bicarbonate as $CaCO_3$		Nickel	<0.05
Total Dissolved Solids			Potassium	
Total Residue	Aluminum		Selenium	<0.005
Biochemical Oxygen $Demand_5$	Antimony		Silver	<0.05
Chemical Oxygen Demand	Arsenic	<0.01	Sodium	
Nitrogen, Ammonia as N	Barium	<0.1	Strontium	
Nitrogen, Nitrite as N	Beryllium		Titanium	
Nitrogen, Nitrate as N	Boron		Vanadium	0.8
Nitrogen, Organic	Cadmium	<0.01	Zinc	0.4
Phosphate, total as P	Calcium, as $CaCO_3$			
Phosphate, Ortho as P (Filterable)	Chromium	<0.05		

*All values reported as mg/l (ppm) unless otherwise indicated

Analyzed by Vicki G. McEachern

EXXON COMPANY, USA
A DIVISION OF EXXON CORPORATION

DATE ISSUED 7/1/85

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
UNIREX N 2

PRODUCT CODE
415172 - 05172

CHEMICAL NAME
Petroleum Lubricating Grease

CAS NUMBER
Complex Mixture
CAS Number not applicable

PRODUCT APPEARANCE AND ODOR
Smooth dark green grease
Mild, bland odor

EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Lubricating Oil Base Stocks	64742-54-7 or 64742-65-0	Greater than 97%
and Lithium complex soap thickener	and Mixture	
Proprietary additives	Mixture	Less than 3%

EXPOSURE LIMIT FOR TOTAL PRODUCT
5 mg/m3 for oil mist in air

BASIS
OSHA Regulation 29 CFR 1910.1000

C. EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If lubricant gets into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN CONTACT
In case of skin contact, remove any contaminated clothing and wash skin with soap and water. If injected under the skin, regardless of the appearance of the wound or its size, contact a physician IMMEDIATELY. Delay may cause loss of affected part of the body.

INHALATION
Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION
If ingested, call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
246°C (475°F)
ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE
Greater than 260°C (500°F)

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, metal oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE , CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
Prolonged or repeated skin contact may cause skin irritation. High pressure grease gun injection injury, where grease is injected through the skin or any part of the body, can cause serious delayed soft tissue damage and should be treated immediately as a surgical emergency.

NATURE OF HAZARD
Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis.

Product contacting the eyes may cause eye irritation.

TOXICITY INFORMATION
Product has a low order of acute oral toxicity.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
IBP Approximately 388°C (730°F)
by ASTM D 2887

SPECIFIC GRAVITY (15.6 C/15.6 C)
0.93

MOLECULAR WEIGHT
Not determined

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
304°C plus (580°F plus)
Dropping Point by ASTM D 2265

VISCOSITY
280 Worked penetration, mm/10, @ 25°C, ASTM D 217

VAPOR PRESSURE
Less than 0.01 mm Hg @ 20°C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
Negligible from open container in 4 hours @ 38°C (100°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F) (n-BUTYL ACETATE = 1)
Less than 0.01

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas. Assure conformity with applicable governmental regulations.

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use local exhaust to capture vapor, mists or fumes, if necessary. Provide greater than 60 feet per minute hood face velocity for confined spaces. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION
Normally not needed at ambient temperatures. Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not handle or store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE
Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION INFORMATION

RANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2737
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2455
HOUSTON, TX 77252-2180
(713) 656-5949

LTOOX EP-2

SOUTHWESTERN ELECTRIC POWER COMPANY
Water Quality Analysis Results

Project: E. P. Toxicity (Pirkey) Date/Time Collected: 1-30-87

Water Body: Location: Grease, A. Oil House

pH/25°C (standard units)		Sulfate as SO_4^{---}		Copper	<0.05
Color (units)		Chloride as Cl^-		Iron	
Specific Conductance (Mmhos/cm)		Fluoride as F^-		Lead	<0.05
urbidity (NTU)		Oil and Grease		Magnesium, as $CaCO_3$	
Acidity, total as $CaCO_3$		Silica		Manganese	
Alkalinity, total as $CaCO_3$		Fecal Coliform (No./100ml)		Mercury	<0.001
Hardness, total as $CaCO_3$		Carbonate as $CaCo_3$		Molybdenum	
Total Suspended Solids		Bicarbonate as $CaCO_3$		Nickel	<0.05
Total Dissolved Solids				Potassium	
Total Residue		Aluminum		Selenium	<0.005
Biochemical Oxygen Demand$_5$		Antimony		Silver	<0.05
hemical Oxygen Demand		Arsenic	<0.01	Sodium	
Nitrogen, Ammonia as N		Barium	<0.1	Strontium	
Nitrogen, Nitrite as N		Beryllium		Titanium	
Nitrogen, Nitrate as N		Boron		Vanadium	<0.2
Nitrogen, Organic		Cadmium	<0.01	Zinc	7.4
Phosphate, total as P		Calcium, as $CaCO_3$			
Phosphate, Ortho as P (Filterable)		Chromium	<0.05		

*All values reported as mg/l (ppm) unless otherwise indicated

Analyzed by Vicki A. McEachern

EXXON COMPANY, USA
A DIVISION OF EXXON CORPORATION

DATE ISSUED 7/1/85

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
LIDOK EP 2

PRODUCT CODE
455153 - 05153

CHEMICAL NAME
Petroleum Lubricating Grease

CAS NUMBER
Complex Mixture
CAS Number not applicable

PRODUCT APPEARANCE AND ODOR
Smooth dark brown grease
Mild, bland odor

EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Lubricating Oil Base Stock and Lubricating Oil Base Stock and Lithium Soap Thickener	64742-62-7 and 64741-96-4 and 7620-77-1	Greater than 95%
Proprietary additives	Mixture	Less than 5%

EXPOSURE LIMIT FOR TOTAL PRODUCT
5 mg/m3 for oil mist in air

BASIS
OSHA Regulation 29 CFR 1910.1000

C. EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If lubricant gets into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN CONTACT
In case of skin contact, remove any contaminated clothing and wash skin with soap and water. If injected under the skin, regardless of the appearance of the wound or its size, contact a physician IMMEDIATELY. Delay may cause loss of affected part of the body.

INHALATION
Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION
If ingested, call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
221°C (430°F)
ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE
Greater than 260°C (500°F)

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, metal oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE , CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
Prolonged or repeated skin contact may cause skin irritation. High pressure grease gun injection injury, where grease is injected through the skin or any part of the body, can cause serious delayed soft tissue damage and should be treated immediately as a surgical emergency.

NATURE OF HAZARD
Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis.

Product contacting the eyes may cause eye irritation.

TOXICITY INFORMATION
Product has a low order of acute oral toxicity.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
IBP Approximately 388°C (730°F)
by ASTM D 2887

SPECIFIC GRAVITY (15.6 C/15.6 C)
0.92

MOLECULAR WEIGHT
Not determined

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
174°C (345°F)
Dropping Point by ASTM D 2265

VISCOSITY
280 Worked penetration, mm/10, @ 25°C, ASTM D 217

VAPOR PRESSURE
Less than 0.01 mm Hg @ 20°C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
Negligible from open container
in 4 hours @ 38°C (100°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)
(n-BUTYL ACETATE = 1)
Less than 0.01

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas. Assure conformity with applicable governmental regulations.

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use local exhaust to capture vapor, mists or fumes, if necessary. Provide greater than 60 feet per minute hood face velocity for confined spaces. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION
Normally not needed at ambient temperatures. Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not handle or store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE
Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2737
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2455
HOUSTON, TX 77252-2180
(713) 656-5949

LIDOX EP-1

SOUTHWESTERN ELECTRIC POWER COMPANY
Water Quality Analysis Results

Project E. P. Toxicity (Pirkey) Date/Time Collected 1-30-87

Water Body _____ Location Grease, E. Oil House

pH/25°C (standard units)	Sulfate as SO_4^{---}			Copper	<0.05
Color (units)	Chloride as Cl^-			Iron	
Specific Conductance (Mmhos/cm)	Fluoride as F^-			Lead	<0.05
rbidity (NTU)	Oil and Grease			Magnesium, as $CaCO_3$	
Acidity, total as $CaCO_3$	Silica			Manganese	
Alkalinity, total as $CaCO_3$	Fecal Coliform (No./100ml)			Mercury	<0.001
Hardness, total as $CaCO_3$	Carbonate as $CaCo_3$			Molybdenum	
Total Suspended Solids	Bicarbonate as $CaCO_3$			Nickel	<0.05
Total Dissolved Solids				Potassium	
Total Residue	Aluminum			Selenium	<0.005
Biochemical Oxygen Demand$_5$	Antimony			Silver	<0.05
emical Oxygen Demand	Arsenic	<0.01		Sodium	
Nitrogen, Ammonia as N	Barium	<0.1		Strontium	
Nitrogen, Nitrite as N	Beryllium			Titanium	
Nitrogen, Nitrate as N	Boron			Vanadium	<0.2
Nitrogen, Organic	Cadmium	<0.01		Zinc	8.8
Phosphate, total as P	Calcium, as $CaCO_3$				
Phosphate, Ortho as P (Filterable)	Chromium	<0.05			

*All values reported as mg/l (ppm) unless otherwise indicated

Analyzed by Vicki A. McEachern

LIDOX EP-1

SOUTHWESTERN ELECTRIC POWER COMPANY
Water Quality Analysis Results

Project E. P. Toxicity (Pirkey) Date/Time Collected 1-30-87

Water Body Location Grease, B. Oil House

pH/25°C (standard units)	Sulfate as SO_4^{---}		Copper	<0.05
Color (units)	Chloride as Cl^-		Iron	
Specific Conductance (Mmhos/cm)	Fluoride as F^-		Lead	<0.05
rbidity (NTU)	Oil and Grease		Magnesium, as $CaCO_3$	
Acidity, total as $CaCO_3$	Silica		Manganese	
Alkalinity, total as $CaCO_3$	Fecal Coliform (No./100ml)		Mercury	<0.001
Hardness, total as $CaCO_3$	Carbonate as $CaCo_3$		Molybdenum	
Total Suspended Solids	Bicarbonate as $CaCO_3$		Nickel	<0.05
Total Dissolved Solids			Potassium	
Total Residue	Aluminum		Selenium	<0.005
Biochemical Oxygen Demand$_5$	Antimony		Silver	<0.05
emical Oxygen Demand	Arsenic	<0.01	Sodium	
Nitrogen, Ammonia as N	Barium	<0.1	Strontium	
Nitrogen, Nitrite as N	Beryllium		Titanium	
Nitrogen, Nitrate as N	Boron		Vanadium	<0.2
Nitrogen, Organic	Cadmium	<0.01	Zinc	6.7
Phosphate, total as P	Calcium, as $CaCO_3$			
Phosphate, Ortho as P (Filterable)	Chromium	<0.05		

*All values reported as mg/l (ppm) unless otherwise indicated

Analyzed by Vicki G. McEachern

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED 7/1/85

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
LIDOK EP 1

PRODUCT CODE
455152 - 05152

CHEMICAL NAME
Petroleum Lubricating Grease

CAS NUMBER
Complex Mixture
CAS Number not applicable

PRODUCT APPEARANCE AND ODOR
Smooth dark brown grease
Mild, bland odor

EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Lubricating Oil Base Stock and Lubricating Oil Base Stock and Lithium Soap Thickener	64742-62-7 and 64741-96-4 and 7620-77-1	Greater than 95%
Proprietary additives	Mixture	Less than 5%

EXPOSURE LIMIT FOR TOTAL PRODUCT
5 mg/m3 for oil mist in air

BASIS
OSHA Regulation 29 CFR 1910.1000

C. EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If lubricant gets into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN CONTACT
In case of skin contact, remove any contaminated clothing and wash skin with soap and water. If injected under the skin, regardless of the appearance of the wound or its size, contact a physician IMMEDIATELY. Delay may cause loss of affected part of the body.

INHALATION
Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen, if available. If overexposed to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION
If ingested, call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
221°C (430°F)
ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE
Greater than 260°C (500°F)

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam or carbon dioxide. Use water to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, metal oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE , CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
Prolonged or repeated skin contact may cause skin irritation. High pressure grease gun injection injury, where grease is injected through the skin or any part of the body, can cause serious delayed soft tissue damage and should be treated immediately as a surgical emergency.

'ATURE OF HAZARD
Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis.

Product contacting the eyes may cause eye irritation.

TOXICITY INFORMATION
Product has a low order of acute oral toxicity.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
IBP Approximately 388°C (730°F)
by ASTM D 2887

SPECIFIC GRAVITY (15.6.C/15.6 C)
0.92

MOLECULAR WEIGHT
Not determined

pH
Essentially neutral

'OUR, CONGEALING OR MELTING POINT
174°C (345°F)
Dropping Point by ASTM D 2265

VISCOSITY
325 Worked penetration, mm/10, @ 25°C, ASTM D 217

VAPOR PRESSURE
Less than 0.01 mm Hg @ 20°C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
Negligible from open container in 4 hours @ 38°C (100°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)
(n-BUTYL ACETATE = 1)
Less than 0.01

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas. Assure conformity with applicable governmental regulations.

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use local exhaust to capture vapor, mists or fumes, if necessary. Provide greater than 60 feet per minute hood face velocity for confined spaces. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION
Normally not needed at ambient temperatures. Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers closed when not in use. Do not handle or store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE
Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2737
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2455
HOUSTON, TX 77252-2180
(713) 656-5949

Chemical Research and Development Department
HALLIBURTON SERVICES
DUNCAN, OKLAHOMA

COMPOSITE DRAIN ANALYSIS

To: Jerry Cossey
Halliburton Industrial Services
Bossier City, LA

Report No. III-0025-85

Date May 9, 1985

This report was prepared by and is the property of Halliburton Services, a Division of Halliburton Company; the data reported, intended for the private information of the below named party, is limited to the sample(s) described; accordingly, any user of this report agrees that Halliburton shall not be liable for any loss or damage, regardless of cause, including any act or omission of Halliburton, resulting from the use of the data reported herein; and Halliburton makes no warranties, express or implied, whether of fitness for a particular purpose, merchantability or otherwise, as to the accuracy of the data reported.

SUBMITTED BY Jerry Cossey UNIT TYPE Boiler

PARTY SWEPCO UNIT NUMBER 5

PLANT LOCATION Arsenal Hill VOLUME 30,000 gallons (113m³)

SAMPLE # (1) Citrosolv & ABF SAMPLE # - SAMPLE # -

Analysis				Material Removed		
	Wt. % in Sample No.					
Component	1	2	3	kg	lb	Reported Form
Iron (Fe)	0.381			598	1316	Magnetite (Fe_3O_4)
Copper (Cu)	0.122			139	305	Copper (Cu)
Nickel (Ni)	0.008			12	25	Nickel Oxide (NiO)
Zinc (Zn)	0.018			26	56	Zinc Oxide (ZnO)
Calcium (Ca)	0.014			40	88	Apatite [$Ca_5(PO_4)_3OH$]
Magnesium (Mg)	0.002			5	12	Brucite [$Mg(OH)_2$]
Silica (SiO_2)	0.003			3	8	Silica (SiO_2)
				823	1810	TOTAL

cc R.M. Lasater
J.R. Gatewood
R.L. Tiner
Ken Stephenson

ds

Analyst

Respectfully submitted,
HALLIBURTON SERVICES
A Division of Halliburton Company

Boyd Montgomery

Boyd Montgomery

BOOK NO. Webb - Book #5713, p. 57
Loohry - Book #5722, p. 58

PS-4594

E. Performance Coal Analysis

Analyses are on an as-received basis; values in parentheses are on a dry basis (moisture free); Hardgrove grindability values were obtained at about the mid-moisture range of the coal.

Item	Average or Typical	Range Minimum	Range Maximum
Moisture, %	32.0	26.0	35.0
Volatile Matter, %	26.9		
Fixed Carbon, %	24.4		
Ash, %	16.7	(15.0)	(38.0)
Carbon, %	37.4		
Hydrogen, %	2.6		
Nitrogen, %	0.7		
Chlorine, %	0.01		
Sulfur, %	1.20	(0.80)	(2.50)
Oxygen (By Difference), %	9.39		
Gross Calorific Value, Btu/lb.	6,300	5,000	7,500
Equilibrium Moisture, % (1)	32.0	26.0	35.0
Hardgrove Grindability Index	55	50	70
Free Swelling Index	Non-Agglomerating		
Ash Analysis, %			
SiO_2	50.0		
Al_2O_3	16.8		
TiO_2	1.0		
Fe_2O_3	14.5		
CaO	6.7		
MgO	2.0		
Na_2O (2)	1.50	0.60	4.00
K_2O	1.36		
SO_3	6.05		
P_2O_5	0.03		
SiO_2/Al_2O_3 Ratio	3.0	2.0	5.0

Notes:

(1) Equilibrium moisture content is a function of ash content.
(2) ASTM ashing method used and Na_2O values used herein are based upon ASTM procedure. Other data show an average of 40 percent sodium oxide volatilized during ashing procedure.

Ash Fusibility, °F	Reducing	Oxidizing
ID	1970	2150
ST	2140	2320
HT	2180	2350
FT	2370	2460

The performance coal analysis shown above is from the Green Bed. Typical low and high ash content coals appear below:

NORTH SECTION
GREEN BED

Ash Analysis	Low Ash Type		High Ash Type	
SiO_2	33.1	40.0	61.0	64.0
Al_2O_3	12.2	16.1	17.7	14.0
TiO_2	0.8	1.0	1.0	1.2
Fe_2O_3	12.4	18.0	6.6	4.3
CaO	16.7	8.2	4.5	5.8
MgO	3.3	2.7	1.8	1.8
Na_2O	3.8	1.0	0.6	0.8
K_2O	0.9	1.0	1.4	2.0
P_2O_5	0.06	0.05	0.04	0.06
SO_3	16.5	11.5	4.5	4.4

Ash Fusibility, °F

	Red.	Oxid.	Red.	Oxid.	Red.	Oxid.	Red.	Oxid.
ID	1900	2100	1930	2150	1980	2120	2050	2280
ST	2090	2210	2000	2270	2190	2340	2280	2440
HT	2120	2240	2070	2320	2230	2380	2430	2600
FT	2180	2280	2200	2410	2500	2700+	2600	2700+

Analyses of the South Section lignite from the Brown Bed and Red Bed follow.

COAL ANALYSIS
SOUTH HALLSVILLE AREA
SOUTH SECTION
BROWN BED

Item	Average or Typical	Range Minimum	Range Maximum
Moisture, %	29.0	26.0	36.0
Volatile Matter, %	25.9		
Fixed Carbon, %	23.6		
Ash, %	21.5	(15.0)	(37.0)
Carbon, %	36.4		
Hydrogen, %	2.6		
Nitrogen, %	0.6		
Chlorine, %	0.01		
Sulfur, %	0.4	(0.4)	(2.00)
Oxygen (By Difference), %	9.49		
Gross Calorific Value, Btu/lb.	6,090	4,900	7,600
Equilibrium Moisture, % (1)	29.0	27	36
Hardgrove Grindability Index	58	49	75
Free Swelling Index	Non-Agglomerating		
Ash Analysis, %			
SiO_2	61.2		
Al_2O_3	18.6		
TiO_2	1.1		
Fe_2O_3	3.2		
CaO	6.5		
MgO	2.7		
Na_2O (2)	1.07	0.50	3.90
K_2O	1.27		
SO_3	4.20		
P_2O_5	0.06		
SiO_2/Al_2O_3 Ratio	3.3	2.5	6.0

Ash Fusibility, °F	Reducing	Oxidizing
ID	2000	2140
ST	2260	2375
HT	2380	2500
FT	2600	2700+

Notes:

(1) Equilibrium moisture content is a function of ash content.
(2) ASTM ashing method used and Na_2O values used herein are based upon ASTM procedure. Other data show an average of 40 percent sodium oxide volatilized during ashing procedure.

Typical low and high ash content ash analyses appear below:

SOUTH SECTION
BROWN BED

Ash Analysis	Low Ash Type		High Ash Type	
SiO_2	36.0	33.8	70.0	69.3
Al_2O_3	11.0	14.1	12.4	14.3
TiO_2	0.7	1.0	1.1	1.2
Fe_2O_3	6.4	13.0	2.8	2.5
CaO	19.2	15.0	5.3	4.7
MgO	4.8	4.5	1.6	1.4
Na_2O	1.7	2.8	0.7	0.8
K_2O	0.9	0.7	1.0	1.2
P_2O_5	0.04	0.05	0.02	0.06
SO_3	18.2	14.5	4.50	3.20

COAL ANALYSIS
SOUTH HALLSVILLE AREA
SOUTH SECTION
RED BED

Item	Average or Typical	Range Minimum	Range Maximum
Moisture, %	30.5	25.0	35.0
Volatile Matter, %	26.0		
Fixed Carbon, %	24.0		
Ash, %	19.5	(15.0)	(38.0)
Carbon, %	36.7		
Hydrogen, %	2.6		
Nitrogen, %	0.6		
Chlorine, %	0.02		
Sulfur, %	0.5	(0.4)	(1.0)
Oxygen (By Difference), %	9.58		
Gross Calorific Value, Btu/lb.	6,210	4,950	7,700
Equilibrium Moisture, % (1)	30.5	24.0	35.0
Hardgrove Grindability Index	58	47	70
Free Swelling Index	Non-Agglomerating		
Ash Analysis, %			
SiO_2	56.5		
Al_2O_3	18.8		
TiO_2	1.2		
Fe_2O_3	3.4		
CaO	8.8		
MgO	3.2		
Na_2O (2)	1.20	0.40	2.50
K_2O	1.16		
SO_3	5.5		
P_2O_5	0.05		
SiO_2/Al_2O_3 Ratio	3.0	2.4	5.0

Ash Fusibility, °F	Reducing	Oxidizing
ID	1980	2070
ST	2150	2310
HT	2200	2340
FT	2280	2420

Notes:

(1) Equilibrium moisture content is a function of ash content.
(2) ASTM ashing method used and Na_2O values used herein are based upon ASTM procedure. Other data show an average of 40 percent sodium oxide volatilized during ashing procedure.

Typical low and high ash content ash analyses appear below:

Ash Analysis	SOUTH SECTION RED BED Low Ash Type		High Ash Type	
SiO_2	46.6	47.3	70.7	65.5
Al_2O_3	19.2	17.5	17.2	17.5
TiO_2	1.3	1.1	0.9	0.8
Fe_2O_3	3.3	4.4	2.2	2.9
CaO	14.2	12.9	3.5	4.5
MgO	3.6	3.3	1.3	1.6
Na_2O	1.40	1.66	0.90	1.31
K_2O	1.00	2.00	1.50	2.00
P_2O_5	0.05	0.05	0.02	0.06
SO_3	8.8	8.9	1.7	3.7

REFERENCE 8

ISW 33240

INS REP 1

HENRY W PIRKEY PWR PLT

Texas Water Commission

INTEROFFICE MEMORANDUM

TO : Sam Pole, Chief, Enforcement Section, Hazardous & Solid Waste Division **DATE:** 11-20-87

THRU: Luis E. Campos, Hazardous & Solid Waste Coordinator, Field Operations Division

NOV 23 1987 FIELD OPERATIONS

FROM : William Gibson, District 5

SUBJECT: Sampling Inspection, Southwestern Electric Power Company-Pirkey Plant, Registration No. 33240

On November 5, 1987, I conducted a sampling inspection at SWEPCO-Pirkey Plant. Samples were taken to verify the removal of contaminated sludge and a portion of the clay liner from the metal cleaning pond. A discussion of the closure of the pond can be found in the inspection report for the October 27 and 28, 1987 hazardous waste inspection. Additional information concerning the closure is included in a November 4, 1987 letter from the Hazardous & Solid Waste Enforcement Section to Jay Pruett. A copy of this letter is attached.

Nine samples were taken from the bottom liner and a sample was taken from halfway up the dike at each end of the impoundment. SWEPCO personnel felt that the samples taken from the dikes would represent uncontaminated material.

The samples were prepared and analyzed according to the method which is described in Methods of Soil Analysis, C.A. Black, 1965. This is an EPA approved method. Each sample was first measured with SWEPCO's pH meter and then with a TWC pH meter. Both meters were calibrated before the analyses and checked following the second analysis. The pH meter electrodes were carefully rinsed with deionized water between each measurement. All pH values are expressed in standard units.

Sample #	SWEPCO pH	TWC pH	Comments
1	4.21	3.73	
2	4.75	4.36	4.0 buffer checked at 4.04
3	4.09	3.50	
4	3.69	3.37	
5	3.65	3.44	
6	4.02	3.70	
7	6.58 *	6.44 *	electrode reacted very slowly
8	4.68	4.43	
9	3.84	3.90	
10	4.31	3.91	
11	3.57	3.28	

*Sample #7 may have been contaminated with the sludge which resulted from the neutralization activities on the waste that was placed in the pond.

Please forward this information to David Buchanan or the appropriate H&SW Enforcement Section personnel.

William Gibson

William Gibson, Inspector

Attachments

John W. Witherspoon

John w. Witherspoon, Manager

MAY 2 0 1986
HAZARDOUS AND SOLID WASTE DIVISION

TWC Reg. No. 33240

TEXAS WATER COMMISSION
Solid Waste Compliance Monitoring Inspection Report

INSPECTION COVER SHEET

C.O. Use Only
6-86 XRC

TWC Dist. 5

EPA ID No. TXD 000726380 COMMERCIAL WASTE Facility ____ GOVT. Facility ____

NAME OF COMPANY Southwestern Electric Power Co., H.W. Pirkey Power Plant

MAILING ADDRESS PO Box 21106, Shreveport, LA. 71156 Tel. (318) 221-2604

SITE LOCATION East of Hallsville and south of IH-20 Tel. (318) 221-2604

COUNTY Harrison TYPE OF INDUSTRY Electric Power Generation from Lignite

GENERATOR CLASSIFICATION: Industrial ✓ Municipal ____

Part A Application submitted to the State ? Yes ____ No ✓ To EPA ? Yes ____ No ✓
Affidavit of Exclusion submitted to the State ? Yes ____ No ✓
Was a written exclusion granted by TWC? Yes ____ No ✓ If yes, Date ____
Will this facility require a permit ? Yes ____ No ✓

CURRENT WASTE MANAGEMENT (Haz.-"H", Class I NonHaz.-"NH", Class II-"II", Class III-"III")

Generator H, NH, II Treatment ____ Storage H, NH Disposal II Transporter ____

HW EXEMPTIONS (check): 90-Day Storage ____ Other ____

*SQG ____ :Total HW Generation Per Month: <100 kg. ✓ 100-1000 kg. ____

H W Facilities (circle appropriate codes): (C) T (SI) WP LT LF I TT TR WDW O

N H Facilities (circle appropriate codes): (C) T SI WP LT (LF) I TT TR WDW O

Anomalies in the above information will be addressed by: (a) Enforcement in progress ✓, (b) Central Office ____, (c) District Office ____, (d) Owner/Operator ____.

Type of Inspection (circle): EV EB EC (CL) GW SA CD FO OT FE SQ SW

Inspector's Name and Title Larry A. Melton, EQS II

Inspection Participants Brian Bond, Environmental Specialist (SWEPCO)

Date(s) of Inspection 04/30/86

Approved: John W. Witherspoon, District Manager Signed: Larry A. Melton, Inspector 5/28/86 Date

* SQG- Small quantity generator, <1000 kg. of hazardous waste per month.

01/8

TWC Reg. No. 33240

TEXAS WATER COMMISSION
Solid Waste Inspection Report
CONTENTS SHEET

COMPANY NAME Southwest Electric Power Company, H.W. Pirkey Power Plant

____ 1. Code Sheet (0814)

✓ 2. Inspection Cover Sheet

____ 3. Special Inspection Cover Sheet (HB.2358)

✓ 4. Generators Checklist (Full RCRA inspection conducted 2-19-86)

____ 5. Small Quantity Generator Checklist

____ 6 General Facilities Checklist

*7. Component Facility Checklists

____ A. Containers (C)
____ B. Tanks (T)
____ C. Surface Impoundments (SI)
____ D. Waste Piles (WP)
____ E. Land Treatment (LT)
____ F. Landfills (LF)
____ G. Incinerators (I)
____ H. Thermal Treatment (TT)
____ I. Chemical, Physical, or Biological Treatment (TR)
____ J. Other (O)

____ 8. Closure and Post-Closure Checklist ✓ Closure-In-Progress Checklist

____ 9. Groundwater Monitoring Checklist ____

____ 10. Notice of Violation (NOV) Letter

____ 11. Interoffice Memorandum (IOM)

____ 12. Registration

✓ 13. Maps, ~~Plans~~, ~~Sketches~~, Table of Sample Results

____ 14. Photographs/Slides

____ 15. Other (describe) ____

* If a required Checklist is omitted, explain: ____

01/

TWC Solid Waste Inspection Report
(40 CFR Part 264 Subpart G; Part 265 Subpart G)
CLOSURE-In-PROGRESS CHECKLIST

TWC Reg. No. 33240

Reg. Facility No.____

Note: To be completed if company is closing a hazardous waste management facility.

1. Type of facility: Hazardous Waste Metal Cleaning Pond (Surface Impoundment)

2. Type of closure: Full-Facility Closure X Partial Closure___

3. Has closure plan received TWC approval or final modification? N/A___ YES X NO___ ***
   Date of approval: June 25, 1985

4. If this is a partial closure, is this the last facility to be closed requiring RCRA ground water monitoring? N/A X YES___ NO___

5. If this is an **interim status** facility:

   a. Has an approved **public notice** of closure been published? N/A X YES___ NO___
   Date published: _____

   b. Is a **public hearing** required ? N/A X YES___ NO___
   Date of hearing: _____

6. Has on-site closure work started ? N/A___ YES X NO___
   Date work initiated: July 5, 1985 (See Comments)

7. Is on-site closure work proceeding according to the work schedule in the approved closure plan ? (See Comments) N/A___ YES___ NO X

8. Have 180 days elapsed since TWC approval of the closure plan? (See Comments) N/A___ YES X NO___

   a. If yes, has the Executive Director approved a closure period of greater than 180 days ? N/A___ YES___ NO X

9. Was District Office notified of sampling event when ~~complete removal~~ core sampling of land-disposal facility was to have been accomplished? N/A___ YES X NO___

10. Were TWC samples taken during the inspection ~~to verify completion of closure~~ ? N/A___ YES X NO___

    NOTE: List chain-of-custody tag numbers in comments section.

11. Is the closure **completed**? YES___ NO X

12. Has the closure **certification** been submitted to TWC? N/A X YES___ NO___
    Attach copy or explain.

*** An entry in this column indicates corrective/response is needed.

12/85

TWC Reg. No. 33240

Checklist Closure-In-Progress

COMMENTS SHEET

Section 6 / Dewatering of the pond began on July 5, 1985.

Section 7 / No specific dates are listed in the work schedule of the closure plan. Core sampling of the pond liner was delayed several times due to wet weather.

Section 8 / Core sampling was carried out on April 30, 1986, approximately 389 days after TWC approval of the closure plan. No records are available to demonstrate Executive Director approval of a closure period exceeding 180 days.

Section 10 / Sludge samples from wastewater pond: SW 11693, 11694, and 11695. Liner core samples from wastewater pond: SW 11692 and 11697. Liner core sample from newly constructed pond not yet in use: SW 11696. Sampling points are shown on attached schematic of facility.

TWC Reg. No. 33240

Checklist Closure-In-Progress

COMMENTS SHEET

Section 1 Liner verification locations (L-1 and L-2) were changed at the last moment by SWEPCO personnel with approval of this inspector. Changes were made so that crane could be used to extract core samples. Attached schematic indicates changed sampling locations.

Section 1

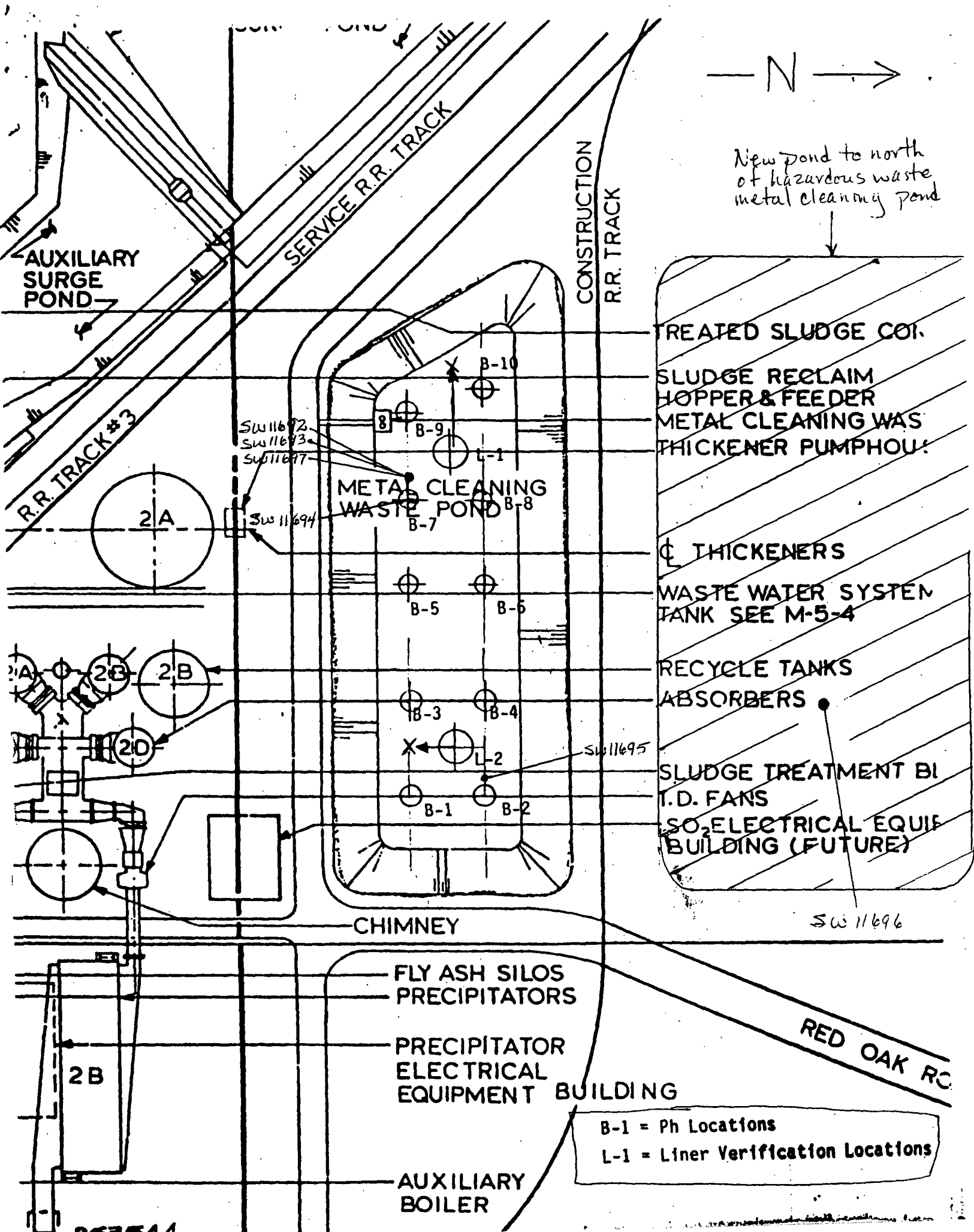
Section 1

Section 1

Southwestern Electric Power Company
H. W. Pirkey Power Plant
Reg. #33240
April 30, 1986 Sampling Results

	Sample	pH*
SW 11692 -	Top 3 inches of pond liner core sample taken approximately 50 feet west of sampling point B7.	3.5
SW 11697 -	3 to 9 inch section of pond liner core taken approximately 50 feet west of sampling point B7.	3.62
SW 11693 -	Sludge taken approximately 50 feet west of sampling point B7.	7.53
SW 11694 -	Sludge from sampling point B7 proper.	7.25
SW 11695 -	Sludge taken approximately 6 feet west of sampling point B2.	4.70
SW 11696 -	Top 6 inches of pond liner core from unused pond north of metal cleaning wastewater pond. (Control sample)	4.34

*pH determined using method described in Method of Soil Analyses, C. A. Black, 1965. Results are verbal from TWC/EPA Lab; will be addended when available.


N
New pond to north of hazardous waste metal cleaning pond
AUXILIARY SURGE POND
SERVICE R.R. TRACK
CONSTRUCTION R.R. TRACK
R.R. TRACK #3
TREATED SLUDGE CO
SLUDGE RECLAIM HOPPER & FEEDER
METAL CLEANING WAS THICKENER PUMPHOU
SW 11692
SW 11693
SW 11697
SW 11694
METAL CLEANING WASTE POND
B-10
B-9
B-8
B-7
L-1
2A
℄ THICKENERS
WASTE WATER SYSTEM TANK SEE M-5-4
B-5
B-6
2A
2C
2B
2D
RECYCLE TANKS
ABSORBERS
B-3
B-4
L-2
SW 11695
SLUDGE TREATMENT BI
I.D. FANS
B-1
B-2
SO2 ELECTRICAL EQUIP BUILDING (FUTURE)
CHIMNEY
SW 11696
FLY ASH SILOS
PRECIPITATORS
RED OAK RO
PRECIPITATOR ELECTRICAL EQUIPMENT BUILDING
2B
B-1 = Ph Locations
L-1 = Liner Verification Locations
AUXILIARY BOILER

REFERENCE 9

REFERENCE 9

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Principal International Businesses

1989

The World Marketing Directory

Dun & Bradstreet International

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How to Use this Directory

For maximum utility, **Principal International Businesses** is divided into three sections, as described below. Every company appearing in the Directory is listed in each section.

Section I—Businesses Geographically:

Countries are listed alphabetically and businesses are listed alphabetically within the country. To the right are examples of listings in Argentina.

Use Section I—Businesses Geographically to:

- Determine the following facts about any given company:

(1) D-U-N-S Number—A universal business identification system developed and maintained by Dun & Bradstreet. Every business establishment in this directory is assigned a random, nine-digit number for positive account identification.

(2) Import/Export Indicator—Shows whether or not company imports and/or exports.

(3) Business Name—Complete legal name of the business or an acceptable abbreviation.

(4) Parent Company—Shows that listed company is a subsidiary, and gives name and location of parent company.

(5) Business Address—Street address, city, province or state and postal codes where applicable. Where city and province or state names are the same, the name will appear once as the city name. For example,

D-U-N-S 00-003-0353 EXP
ABREGO & CIA S A C e I
Av San Martin 231, Cordoba

(6) Cable address or telex number.

(7) Sales Volume—Latest figures available in local currency (M represents Thousands).

(8) Employees—Total number of employees.

(9) Year Started.

(10) Standard Industrial Classification Number (SIC)—A four-digit number identifying specific function and product and/or service category.

(11) Lines of Business—Description of specific activities.

(12) Chief Executive—Name and title of senior operating officer.

- Identify prospects by country.
- Select potential customers by size and volume.
- Improve direct mail campaigns by identifying chief officer.
- Establish realistic sales territories.
- Reach decision-makers by choosing parent or subsidiary company.
- Simplify accounting procedures by adopting D-U-N-S Numbers.

ARGENTINA

D-U-N-S 00-001-0264 EXP
ABALOS MANUEL S A
Av Rivadavia 535/47 Mar del Plata,
Buenos Aires DF
Telex 121762
Sales 183 423 M *Employees* 2250
Year Started 1969
SIC 3731 3732
Ship and Boat Building and Repairing
Tomas Ramirez, *President*

D-U-N-S 00-003-0429 IMP EXP
ABELAN S A I C
(Subsidiary of INTRAPORTA REFINING S A
Buenos Aires, Argentina)
Av Fraccionamiento 4325, Rosario, Santa Fe
Telex 121497
Sales 152 353 M *Employees* 7500
Year Started 1958
SIC 2911 2992
Petroleum Rifining and Petroleum Products
Carlos Avellaneda, *President*

D-U-N-S 00-001-0793 IMP
ABELEOZI INDUSTRIA S A
Av San Matias 617, Lujan, Mendoza
Telex 121324
Sales 190 401 M *Employees* 2700
Year Started 1962
SIC 2816 2842 2899 3291 3541
Manufacturer Metallic Pigments, Abrasives,
Metal Polish, Polishing Lathes, Metal
Pedro D. Lugona, *President*

D-U-N-S 00-003-0353 EXP
ABREGO & CIA S A C e I
Av San Martin 231, Cordoba
Telex 121157
Sales 99 151 M *Employees* 500
Year Started 1954
SIC 5083
Wholesale Farm and Garden Machinery and
Equipment
Francisco Perez, *Managing Director*

D-U-N-S 00-002-0156 IMP
ACERAS & CIA S A C I Y F
Av Pena 5001, Olivos, Buenos Aires DF
Telex 121369
Sales 330 324 M *Employees* 3300
Year Started 1963
SIC 2257 2299
Knit Fabric Mill, Textile Goods, Fabricated
Textile Products
Jose M. Cortez, *Chairman of Board*

D-U-N-S 00-004-0212 IMP EXP
ACRILICOS RIO DE LA PLATA S A I C
Av Concepcion 601, Rosario, Santa Fe

D-U-N-S 00-002-022
ADERFLO S A I C F
Calle Peru 1073, Bueno
Telex 121378
Sales 320 162
Year Started 19
SIC 3561
Manufacturer hydrauli
Miguel Moreno, *Pre*

D-U-N-S 00-003-079
AEROLINEAS SUNDAT
9 de Julio 4987, Buenos
Telex 121299
Sales 650 245
Year Started 19
SIC 4511
Passenger and Cable
Eduardo Morales, *P*

D-U-N-S 00-001-026
AGOSTINO & CIA S
Esmeralda 6597, Bueno
Telex 121637
Sales 260 117
Year Started 19
SIC 7011 581
Hotel and Restaurant
Juan Gonzalez, *Ma*

D-U-N-S 00-004-015
AGUIRRE & RODRIGU
Maldonado 9863, Cordo
Telex 121741
Sales 190 838
Year Started 19
SIC 5311
Department Store
Pablo Gutierrez, *Pre*

D-U-N-S 00-003-031
AIRCOLD S A C I
Av Chacaito 963, Rio C
Telex 121741
Sales 195 775
Year Started 19
SIC 3585
Manufacturer Air Cont
Ruben Vazquez, *Ma*

D-U-N-S 00-002-071
ALGODONERA TREBO
Av Boca de Leon 9312,
Telex 121962
Sales 115 285
Year Started 19
SIC 2211 222
Coton and Acetate Fa
Manfredo Lopez, *Ma*

D-U-N-S 06-285-9814 EXP
SOUTHERN MN BEET SUGAR CO-OP
Hwy 212 E 2 Miles, Renville, Mn 56284
Sales 83 200 M *Employees* 175
Year Started 1975
SIC 2063
Mfg Beet Sugar
Irvin Zitterkopf

D-U-N-S 00-690-0518
SOUTHERN NATURAL GAS CO
1900 5th Ave N, Birmingham, Al 35202
Sales 1 920 000 M *Employees* 1,600
Year Started 1973
SIC 4922
Natural Gas Transm
William E Matthews

D-U-N-S 15-118-0593
SOUTHERN NEW ENG TLMNCTNS CORP
227 Church St, New Haven, Ct 06510
Sales NA *Employees* 13,800
Year Started 1
SIC 6719
Holding Companies
Walter H Monteith J

D-U-N-S 00-691-7926
SOUTHERN NEW ENGL TELE CO*
227 Church St, New Haven, Ct 06506
Sales 1 300 000 M *Employees* 13,500
Year Started 1882
SIC 4813
Telephone Comm
Walter H Monteith J

D-U-N-S 07-980-2831
SOUTHERN OH COAL CO*
161 W Main St, Lancaster, Oh 43130
Sales 318 000 M *Employees* 2,440
Year Started 1956
SIC 1221
Bituminous Coal Min
W S White Jr

D-U-N-S 04-525-5767
SOUTHERN PACIFIC CO*
1 Market Plz, San Francisco, Ca 94105
Sales 3 020 000 M *Employees* 28,200
Year Started 1969
SIC 6719 6531 4619 6159 7359 4011
Holding Companies
Alan C Furth

D-U-N-S 02-860-2381
SOUTHERN PACIFIC PIPE LINES*
888 S Fugueroa St, Los Angeles, Ca 90017
Sales 151 000 M *Employees* 380
Year Started 1955
SIC 4613 4619
Refnd Pete Pipeline
R J Hunt

D-U-N-S 00-691-3206
SOUTHERN PACIFIC TRNSPRTN CO*
1 Market Plz, San Francisco, Ca 94105
Sales 2 360 000 M *Employees* 27,200
Year Started 1884
SIC 4011 4213
Line-Haul Rr Opertn
D K Mcnear

D-U-N-S 00-128-8455 IMP EXP
SOUTHERN PERU COPPER CORP
180 Maiden Ln, New York, Ny 10038
Sales 294 000 M *Employees* 6,050
Year Started 1952
SIC 1021 3331
Copper Ore Mining
C G Preble

D-U-N-S 00-692-0417
SOUTHERN RAILWAY CO*
One Commercial Pl, Norfolk, Va 23510
Sales 1 670 000 M *Employees* 16,500
Year Started 1894
SIC 4011
Line-Haul Rr Opertn
Arnold B Mckinnon

D-U-N-S 00-694-7972 IMP EXP
SOUTHERN SCRAP MATERIAL CO LTD
4801 Florida Ave, New Orleans, La 70186
Sales 60 000 M *Employees* 400
Year Started 1939
SIC 5093 5084 5999 1795
Scrap & Waste Mtls
Stanley Diefenthal

D-U-N-S 00-896-4637
SOUTHERN STATES CO-OP INC
6606 W Broad St, Richmond, Va 23230
Sales 660 000 M *Employees* 4,000
Year Started 1923

D-U-N-S 04-729-6280
SOUTHERN VITAL RECORD CENTER
Kearney Industrial Pk Rd, Flora, Ms 39071
Sales 32 800 M *Employees* 600
Year Started 1972
SIC 7389
Business Svs Nec
Richard C Edmonson

D-U-N-S 00-734-7602
SOUTHLAND CORP
2828 N Haskell Ave, Dallas, Tx 75204
Sales 12 700 000 M *Employees* 58,500
Year Started 1934
SIC 5411 2026 2024 2097 2842 5531
Grocery Stores
Jere W Thompson

D-U-N-S 06-897-9624
SOUTHLAND LIFE INSURANCE CO*
6400 Legacy Dr, Plano, Tx 75024
Sales NA *Employees* 1,260
Year Started 1984
SIC 6311 6321
Life Insurance
Max T Murray

D-U-N-S 05-421-2220
SOUTHMARK CORP
1601 Lbj Fwy, Dallas, Tx 75234
Sales 572 000 M *Employees* 10,000
Year Started 1970
SIC 6512 6513 6162 7011 6321 1382
Nresidential Bld Op
Gene E Phillips

D-U-N-S 11-310-7569
SOUTHMARK FINANCIAL SERVICES*
1601 Lbj Fwy, Dallas, Tx 75234
Sales 20 600 M *Employees* 1,330
Year Started 1
SIC 6211
Security Brk, Dealer
Edward J Harrison

D-U-N-S 07-544-8449
SOUTHTRUST CORP
420 N 20th St, Birmingham, Al 35290
Sales NA *Employees* 3,500
Year Started 1968
SIC 6022 6719
State Commercial Bk
Roy W Gilbert Jr

D-U-N-S 05-532-9262
SOUTHWEST AIRLINES CO*
Love Fld Box 37611, Dallas, Tx 75235
Sales 679 000 M *Employees* 5,270
Year Started 1967
SIC 4512
Scheduled Air Trans
Herbert D Kelleher

D-U-N-S 05-934-7070
SOUTHWEST COLOR PRINTING CORP
3001 Atkinson Rd, Lufkin, Tx 75902
Sales 50 000 M *Employees* 230
Year Started 1
SIC 2759 2752
Coml Printing Nec
Paul Koessler

D-U-N-S 00-839-8661 EXP
SOUTHWEST FOREST INDUSTRIES*
6225 N 24th St, Phoenix, Az 85016
Sales 700 000 M *Employees* 4,500
Year Started 1935
SIC 2621 2631 2421 2436
Paper Mills
William A Franke

D-U-N-S 04-523-8755 IMP
SOUTHWEST LEASING CORP
12312 W Olympic Blvd, Los Angeles, Ca 90064
Sales 62 300 M *Employees* 200
Year Started 1960
SIC 7514 7359
Passenger Car Rent
Warren D Axelrod

D-U-N-S 08-091-1274
SOUTHWEST MARINE INC
Foot Of Sampson St, San Diego, Ca 92113
Sales 118 000 M *Employees* 1,900
Year Started 1976
SIC 3731
Ship Bld, Repairing
Arthur E Engel

D-U-N-S 05-512-8797
SOUTHWEST SUBARU INC
12615 San Pedro, San Antonio, Tx 78216
Sales 100 000 M *Employees* 60
Year Started 1981

D-U-N-S 10-802-4050
SOUTHWESTERN BELL CORP
One Bell Center, St Louis, Mo 63101
Sales 7 920 000 M *Employees* 71,900
Year Started 1
SIC 4813 7319 5063
Telephone Comm
Zane E Barnes

D-U-N-S 00-696-8523
SOUTHWESTERN BELL TELE CO*
1010 Pine St, St Louis, Mo 63101
Sales 7 110 000 M *Employees* 65,800
Year Started 1917
SIC 4813
Telephone Comm
John E Hayes Jr

D-U-N-S 00-694-8764
SOUTHWESTERN ELECTRIC PWR CO*
428 Travis, Shreveport, La 71156
Sales 723 000 M *Employees* 2,080
Year Started 1912
SIC 4911
Electric Services
John W Turk

D-U-N-S 00-690-2936
SOUTHWESTERN ENERGY CO*
One Mcilroy Plz, Fayetteville, Ar 72702
Sales 78 800 M *Employees* 405
Year Started 1929
SIC 1311 4923 6719
Crude Pete, Natu Gas
Charles E Scharlau

D-U-N-S 05-228-4759 IMP EXP
SOUTHWESTERN ENGINEERING CO*
5701 S Eastern Ave, Los Angeles, Ca 90040
Sales 55 000 M *Employees* 450
Year Started 1969
SIC 3585
Rfrgn & Heating Eqp
Robert Weisberg

D-U-N-S 05-141-9976
SOUTHWESTERN GENERAL CORP
25548 Genesee Trail Rd, Golden, Co 80401
Sales 313 000 M *Employees* 1,800
Year Started 1981
SIC 3568 3321 2439
Power Transm Eqp
Michael R Krupp

D-U-N-S 00-739-7185 EXP
SOUTHWESTERN IRG CT GR ASSN
Po Box 1709, El Paso, Tx 79949
Sales 56 600 M *Employees* 100
Year Started 1926
SIC 2074 5159
Cottonseed Oil Mill
David L Hand

D-U-N-S 00-790-3073
SOUTHWESTERN OH STEEL INC
903 Belle Ave, Hamilton, Oh 45012
Sales 117 000 M *Employees* 400
Year Started 1945
SIC 5051
Metal Sv Center, Off
Paul A Pappenheimer

D-U-N-S 00-736-9713
SOUTHWESTERN PUBLIC SV CO*
Tyler At Sixth, Amarillo, Tx 79170
Sales 808 000 M *Employees* 2,150
Year Started 1921
SIC 4911
Electric Services
W R Esler

D-U-N-S 05-564-9974
SOUTHWESTERN SCIENTIFIC CO*
4345 E Irvington, Tucson, Az 85714
Sales NA *Employees* 150
Year Started 1969
SIC 5122 3995 4213
Drugs, Propty & Snd
H L Stackhouse

D-U-N-S 04-345-7977
SOVEREIGN GROUP INC
8900 Keystone Crossing, Indianapolis, In 46240
Sales NA *Employees* 950
Year Started 1
SIC 3429 5072 7381 6159 7514 7513
Misc Mtl Pdt & Hdwr

D-U-N-S 00-794-0745
SOVRAN BK NA*
12th & Main Sts, Richmond, Va 23261
Sales NA *Employees* 6,690
Year Started 1963

REFERENCE 10

REFERENCE 10

Directory of Corporate Affiliations

1989

'Who Owns Whom' The family tree of every major corporation in America

NRPC National Register Publishing Company

PORATION—(Continued)

ic
sch
ardt
n, III
er
s

31050-000
ank Dallas(Transfer

)

6780-044
Construction

(NV)
(100%)
1541
(Chm. & Chief Exec.
e Chm.)
V.P. & Gen. Counsel)
ntry (V.P.)

6780-001
Co., Inc. (2)
(TX)
(100%)
m. & Chief Exec. Officer)
V.P. & Treas.)
(Exec. V.P. & Chief Oper.

6780-035
ction Company, Inc. (2)
6 (NV)
(100%)
Chm. & Chief Exec.
s. & Chief Oper. Officer)
V.P. & Treas.)

6780-033
& Brother, Inc. (2)
13 (NV)
(100%)
(Pres. & Chief Exec.
c. V.P.)

6780-038
(2)
Aetna
38 (NV)
(80%)
Pres. & Chief Exec.
Sr. V.P.)

6780-037
ses, Inc. (2)
Blvd.
33306 (NV)
(100%)
& Chief Exec. Officer)
(Exec. V.P.)

6780-045
Corporation (3)
e Blvd., Ste.210
(FL)
(100%)
s. & Chief Exec. Officer)
sen (Exec. V.P.)

6780-046
, Inc. (3)
Blvd.
33306 (FL)
(100%)
& Chief Exec. Officer)

6780-026
Enterprises, Inc. (1)
Tower
(NV)
(100%)

James J. Sievers *(Pres. & Chief Exec. Officer)*
Arthur R. Zunker, Jr. *(Sr. V.P.)*

Subsidiaries:

6780-047
Brazos Point, Inc. **(2)**
6032 Jacksboro Highway
Fort Worth, TX 76135 (DE)
Tel.: 817-237-0058 (100%)
Aggregates
S.I.C.: 1442; 5211
Thomas R. Crossett *(Pres.)*

6780-034
Centex American Gypsum Co. **(2)**
8001 Jefferson
Albuquerque, NM 87113 (NM)
Tel.: 505-823-2022 (100%)
Mfr. Wallboard
S.I.C.: 3275
Roger L. Wallace *(Pres. & Chief Exec. Officer)*
Roger A. Evje *(Exec. V.P.)*
Robert L. Meek *(Exec. V.P.)*

6780-010
Centex Materials, Inc. **(2)**
P.O. Box 2252
Austin, TX 78768 (NV)
Tel.: 512-327-3652 (100%)
Readymix Concrete
S.I.C.: 3273
Albert V. McGraw *(Chief Oper. Officer)*

6780-017
Illinois Cement Co. **(2)**
P.O. Box 442
La Salle, IL 61301
Tel.: 815-224-2112 (50%)
Cement Mfr.
S.I.C.: 3241
Joseph L. Baker *(Chief Oper. Officer)*

6780-032
Mathews Readymix, Inc. **(2)**
Oroville & Gridley Highway
Gridley, CA 95948 (CA)
Tel.: 916-846-5643 (100%)
Mfr. Ready Mixed Concrete & Aggregates
S.I.C.: 3273
Gordon Mathews *(Pres.)*

6780-040
Mountain Cement Company **(2)**
P.O. Box 339
Laramie, WY 82070 (NV)
Tel.: 307-745-4879 (100%)
Joint Venture of Lone Star Industries, Inc. & Centex Corporation
S.I.C.: 3241
Harry Huber *(Pres.)*

6780-018
Nevada Cement Co. **(2)**
P.O. Box 895
Fernley, NV 89408 (NV)
Tel.: 702-575-2281 (100%)
Cement Mfr.
S.I.C.: 3241
David L. Dalton *(Chief Oper. Officer)*

6780-020
Texas-Lehigh Cement Co. **(2)**
P.O. Box 610
Buda, TX 78610
Tel.: 512-477-2607 (50%)
Cement Mfr.; Joint-Venture
S.I.C.: 3241
Gerald J. Essl *(Pres.)*

Joint-Venture:

6780-002
Texas Sunbelt Cement **(3)**
P. O. Box 9294
Corpus Christi, TX 78408
Tel.: 512-883-6381 (25%)
Cement Mfg.; Joint Venture with Cementos Mexicanos, S.A.
S.I.C.: 3241
David Freeland *(Pres.)*

6780-049
Western Aggregates, Inc. **(2)**
333 Lee Pkwy.
Dallas, TX 75219
Tel.: 214-559-6500
Robert K. Thompson *(Pres.)*

6780-004
Centex Homes Corporation **(1)**
333 Lee Pkwy.
Dallas, TX 75219 (NV)
Tel.: 214-559-6500 (100%)
Home Bldg.
S.I.C.: 1521
Harry J. Leonhardt *(Chm. Bd. & Chief Exec. Officer)*
William J. Gillian III *(Pres. & Chief Oper. Officer)*

Subsidiaries:

6780-029
CTX Mortgage Co., Inc. **(2)**
3333 Lee Pkwy.
Dallas, TX 75219 (NV)
Tel.: 214-559-6500 (100%)
Approx. Assets: $1,720,849,000
Fiscal Year-end: 3/31/87
Mortgage Bankers
S.I.C.: 6162
Carl N. Hearne *(Pres.)*
Richard K. Smith *(Exec. V.P.)*

† • 27859-000
CENTOCOR, INC.
244 Great Valley Parkway
Malvern, PA 19355
Tel.: 215-296-4488 **PA**
Telex: 173-190
Telefax: 215-644-7558
CNTO—(OTC)
Assets: $149,397,212
Liabilities: $34,668,664
Net Worth: $114,728,548
Approx. Rev.: $57,384,918
Emp: 275
Fiscal Year-end: 12/31/87
Biotechnology, Including Diagnostic Blood Tests, Imaging Agents, Therapeutic Products, Genetic Engineering, Monoclonal Antibodies
S.I.C.: 8731; 2836
Hubert J. P. Shoemaker, Ph.D. *(Chm. Bd. & Chief Exec. Officer)*
James E. Wavle, Jr. *(Pres. & Chief Oper. Officer)*
Jacques E. Fonteyne *(Exec. V.P.-Intl.)*
David P. Holveck *(Exec. V.P.-No. America)*
Dr. Harvey J. Berger *(Sr. V.P.-Medical Affairs)*
Dr. Vincent R. Zurawski, Jr. *(Sr. V.P.-Technical Affairs & Sec.)*
Dr. Bert C. DelVillano *(V.P.-Diagnostic Product Sls.)*
Charles Cabot III *(V.P.-Personnel & Investor Rels. Dir.)*
Bruce A. Peacock *(Chief Fin. Officer)*
Kim Pollock *(Dir.-Data Processing)*
Paul Touhey *(Dir.-Pur.)*
Board of Directors:
Dr. Hubert J. P. Schoemaker
John G.K. Brookhuis
Anthony B. Evnin
Dr. William F. Hamilton
John R. Furrer
Antonie T. Knoppers
James E. Wavle

31151-000
Bank of Boston*(Transfer Agent)*
100 Federal St.
Boston, MA 02110
Tel.: 617-434-2200

Subsidiaries/Partnerships:

27859-001
Centocor Cardiovascular Imaging Partners, L.P. **(1)**
244 Great Valley Parkway
Malvern, PA 19355
Tel.: 215-296-4488 (100%)
Research & Devel.
S.I.C.: 8731

27859-005
Centocor Partners II, L.P. **(1)**
244 Great Valley Parkway
Malvern, PA 19355
Tel.: 215-296-4488
Research & Devel.
S.I.C.: 8731

27859-007
Centocor Partners III, L.P. **(1)**
244 Great Valley Parkway
Malvern, PA 19355
Tel.: 215-296-4488
Research & Devel.
S.I.C.: 8731

• 6789-000
CENTRAL AND SOUTH WEST CORPORATION
2121 San Jacinto St., Ste. 2500
Dallas, TX 75201
Mailing Address: P.O. Box 660164
Dallas, TX 75266
Tel.: 214-754-1000 **DE**
Telefax: 214-754-1033
CSR—(NYSE Bo Ci MW Ph)
Assets: $7,619,000,000
Earnings: $402,000,000
Liabilities: $5,105,000,000
Net Worth: $2,514,000,000
Approx. Rev.: $2,436,000,000
Emp: 8,894
Fiscal Year-end: 12/31/87
Electric Utility Holding Co.
S.I.C.: 6719; 4911; 8741
Merle L. Borchelt *(Chm., Pres. & Chief Exec. Officer)*
E. R. Brooks *(Exec. V.P. & Pres. & Chief Exec. Officer-Central & So. W. Srvc.)*
Ferd. C. Meyer *(V.P. & Gen. Counsel)*
C. Wayne Stice *(V.P.-Human Resources)*
Philip I. McConnell *(Sec.)*
Wm. F. Malec *(Treas.)*
Glen D. Rosilier *(Controller)*
Michael J. Intille *(Data Processing Dir.)*
B. Joe Gore *(Pur. Dir.)*
Board of Directors:
T. J. Barlow
Merle L. Borchelt
B. R. Brooks
Durwood Chalker
Joe H. Foy
Sherman M. Hunt
E. Glenn Biggs
James L. Powell
Arthur E. Rasmussen
J. C. Templeton
James M. Moroney
Samuel W. White, Jr.
John H. Williams

Subsidiaries:

6789-001
Bedford Wire Div. **(1)**
539 N. Carancahua
Corpus Christi, TX 78401 (TX)
Mailing Address: P.O. Box 2121
Corpus Christi, TX 78401
Tel.: 512-881-5300 (100%)
Approx. Rev.: $768,264,000
Emp: 2,650
Fiscal Year-end: 12/31/87
Electric Utility
S.I.C.: 4911
T. V. Shockley *(Pres. & Chief Exec. Officer)*

6789-003
Central and South West Services, Inc. **(1)**
P.O. Box 660164, 2121 San Jacinto St., Ste. 2500
Dallas, TX 75266 (TX)
Tel.: 214-754-1000 (100%)
Emp: 385
Service Co.-Accounting, Tax, Engmg., Legal & Financial Consulting
S.I.C.: 8741
E. R. Brooks *(Pres. & Chief Exec. Officer)*

6789-004
Public Service Company of Oklahoma **(1)**
212 E. 6th
Tulsa, OK 74102 (OK)
Mailing Address: P.O. Box 201
Tulsa, OK 74102
Tel.: 918-599-2000 (100%)
Approx. Rev.: $628,345,000
Emp: 1,983
Fiscal Year-end: 12/31/87
Electric Utility
S.I.C.: 4911
Martin E. Fate, Jr. *(Pres. & Chief Exec. Officer)*

Subsidiary:

6789-008
Ash Creek Mining Company **(2)**
North of Sheridan
Sheridan, WY 82801
Tel.: 307-750-2271 (100%)
Emp: 1
Coal Mining
S.I.C.: 1221
Martin E. Fate, Jr. *(Chm. Bd. & Chief Exec. Officer)*

6789-005
Southwestern Electric Power Co. **(1)**
428 Travis St.
Shreveport, LA 71156 (DE)
Mailing Address: P.O. Box 21106
Shreveport, LA 71156
Tel.: 318-222-2141 (100%)
Approx. Rev.: $714,652,000
Emp: 2,000
Fiscal Year-end: 10/31/87
Electric Utility
S.I.C.: 4911
Harry D. Mattison *(Pres. & Chief Exec. Officer)*

6789-007
Transok, Inc. **(1)**
P.O. Box 3008, 600 So. Main St.
Tulsa, OK 74101
Tel.: 918-583-1121
Approx. Rev.: $115,521,000
Emp: 395
Fiscal Year-end: 12/31/87
Intrastate Natural Gas Pipeline & Gas Processor
S.I.C.: 1389
E. R. Brooks *(Pres. & Chief Exec. Officer)*

West Texas Utilities Co. **(1)**
P.O. Box 841, 301 Cypress
Abilene, TX 79604
Tel.: 915-672-3251
Approx. Rev.: $256,756,000
Emp: 1,481
Fiscal Year-end: 12/31/87
Electric Utility
S.I.C.: 4911
Glen D. Churchill *(Pres. & Chief Exec. Officer)*

CSW Credit, Inc. **(1)**
P.O. Box 660164, 2121 San Jacinto St., Suite 2500
Dallas, TX 75201
Tel.: 217-754-1000
Approx. Sls.: $39,000,000
Captive Finance Company Buys At A Discount Accounts Receivables of Elec Companies
William F. Malec *(Pres.)*

CSW Energy, Inc. **(1)**
2121 San Jacinto St., Suite 2500
Dallas, TX 75201
Mailing Address: P.O. Box 660164
Dallas, TX 75266
Tel.: 214-754-1000
Investigates Non-regulated Investment Opportunities
Merle L. Borchelt *(Pres.)*

CSW Financial Inc. **(1)**
Po Box 660164, 2121 San Jacinto St, Suite 2500
Dallas, TX 75266
Tel.: 214-754-1000
Invested In Tax Benefit Transfers Author By The 1981 Tax Reduction Act.
Merle L. Borchelt *(Chm., Pres. & Chief Exec. Officer)*

CSW Leasing, Inc. **(1)**
PO Box 660164, 2121 San Jacinto, Suite 2500
Dallas, TX 75266
Tel.: 214-754-1000
Joint Venture With Manufacturerer's Hanover Leasing Corp. To Invest In Leveraged Le

•
CENTRAL FIDELITY BANKS, INC.
Broad at 3rd St.
Richmond, VA 23219
Mailing Address: P. O. Box 27602
Richmond, VA 23261
Tel.: 804-782-4000
CFBS—(OTC)
Assets: $4,231,533,000
Earnings: $47,300,000
Liabilities: $3,969,631,000
Net Worth: $261,902,000
Approx. Income: $407,020,000
Emp: 2,800
Fiscal Year-end: 12/31/87
Bank Holding Co.
S.I.C.: 6712; 6021
Carroll L. Saine *(Chm. & Chief Exec. Officer)*
Lewis N. Miller, Jr. *(Pres.)*
Donald F. DeLaney *(Chief Fin. Officer)*
Marian H. Fariss *(Sec.)*
Board of Directors:
Rhae W. Adams
James F. Betts
William H. Chambliss
Alvin R. Clements
Richard J. Davis
Robert C. Dawson
Howard W. Dobbins
Edwin C. Ferguson, Jr.
Jack Ferguson
Robert L. Freeman
Thomas R. Glass
Lewis B. Goode, Jr.
Joseph A. Johnson
Stewart M. Kasen
John W. Landis
Minnie Bassett Lane
George R. Lewis
G. Bruce Miller

(continued next page)

REFERENCE 11

III A

TEXAS WATER COMMISSION TWC Reg. No. 33240

Solid Waste Compliance Monitoring Inspection Report

C.O. Use Only

INSPECTION COVER SHEET

NOV 24 1987

1148

TWC District 5

EPA ID No. TXD 000726380 COMMERCIAL WASTE FACILITY ___ GOVT. FACILITY ___

NAME OF COMPANY Southwestern Electric Power Company

MAILING ADDRESS P.O. Box 21106 Shreveport, Louisiana 71156 Tel. (318) 221-2604

SITE LOCATION H.W. Pirkey Power Plant Hallsville, Texas Tel. (214) 935-3181

COUNTY Harrison TYPE OF INDUSTRY Electrical Generation

GENERATOR CLASSIFICATION: Industrial ✓ Municipal ___

OPERATIONAL STATUS: Active

Part A Permit Application submitted to the State? Yes ✓ No ___ To EPA? Yes ✓ No ___
Affidavit of Exclusion submitted to TWC? Yes ✓ No ___
Was a written exclusion granted by TWC? N/A ___ Yes ___ No ✓ ...If yes, Date: ___
Will this facility require a RCRA permit? Yes ___ No ✓

CURRENT WASTE MANAGEMENT (Haz.-"H"; Class I NonHaz.-"NH"; Class II-"II"; Class III-"III")

Generator H, NH, II Treatment ___ Storage H, NH Disposal NH, II Transporter ___

HW EXEMPTIONS: 90-Day Accumulation: ✓ Other: Elementary Neutralization

SQG ✓: Total HW Generation Per Month: <100 kg. ___ 100-1000 kg. ✓

H W FACILITIES (circle facility codes): (C) T (SI) WP LT LF I TT TR WDW O

N H FACILITIES (circle facility codes): (C) T (SI) WP LT (LF) I TT TR WDW O

Anomalies in the above information will be addressed by: (a) Enforcement in progress ✓, (b) Owner/Operator ___, (c) District Office ___, (d) Central Office ___.

TYPE OF INSPECTION (circle): (CEI) SQG CL CD SA OT FO SP

Inspector's Name and Title William Gibson, Field Investigator

Inspection Participants Rick Bowles, TWC Brian Bond, Swepco

(s) of Inspection 10/27-28/87

i: William Gibson 11-20-87
Inspector Date

NOV 23 1987

FIELD OPERA

ed: [signature] FOR
District Manager JOHN W. WITHERSPOON

07/87

t

not

/87

TWC Solid Waste Inspection Report

TWC Reg. No. 33240

CLOSURE-in-PROGRESS CHECKLIST

Reg. Facility No. unregist

Type of facility component: surface impoundment

1. Is the facility component being closed a RCRA unit? YES ✓ NO ___

2. Type of closure: Full-Facility Closure ✓ Partial Closure ___ ***

3. Has **closure plan** received TWC approval or final modification? N/A ___ YES ✓ NO ___
   Date of approval: 06/25/85

4. Is this the last on-site facility to be closed which requires RCRA groundwater monitoring? N/A ___ YES ✓ NO ___

5. Has an approved **public notice** of closure been published? N/A ___ YES ___ NO ✓
   Date published: ___

6. Is a **public hearing** required? YES ✓ NO ___
   Date of hearing: ___

7. Has on-site closure work started? YES ✓ NO ___
   Date work initiated: 07/05/85

8. Is closure work proceeding according to the work schedule in the approved closure plan? N/A ✓ YES ___ NO ___

9. Have 180 days elapsed since TWC approval of the closure plan? N/A ___ YES ✓ NO ___

   a. If Yes,
      Has TWC approved an extension period? N/A ___ YES ___ NO ✓

10. Was District Office notified of sampling event when complete removal (i.e., clean closure) of a Land Disposal facility was to have been accomplished? N/A ✓ YES ___ NO ___ com

11. Were **TWC samples** taken to verify completion of closure? NA YES ___ NO ___

    NOTE: List chain-of-custody sample tag numbers in comments.

12. Is the closure work **completed**? YES ___ NO ✓
    Date of completion: ___

13. Has the closure **certification** been submitted to TWC? N/A ✓ YES ___ NO ___
    Attach copy or explain.
    Date of certification: ___

*** An entry in this column indicates explanation/response is needed.

TWC Reg. No. 33240

TWC Solid Waste Inspection Report

GROUND WATER MONITORING CHECKLISTS

1. GROUND WATER MONITORING STATUS:
   Complete the table for each Waste Management Area (WMA): See Comments

WMA	Description	Activity Status	Monitoring Status	Number of Wells
1	Surface Impoundment (Metal Cleaning Pond)	Inactive	?	U ? D ?
2				U D
3				U D
4				U D

   Give date of approval for waivers, alternate plan, or assessment plan, as applicable: _____

2. Provide a diagram locating each monitoring well and waste site(s). List depths, diameter and completion data on each well not included on the previous inspection report.

3. Has the following been installed in the uppermost aquifer around each Waste Management Area:

   a. At least **one** hydraulically **upgradient** well? YES___ NO ✓ ***
   b. At least **three** hydraulically **downgradient** wells? YES___ NO ✓
   c. Indicate WMA(s) that that are not compliant: _____
   d. Describe possible problems on Comments Sheet.

4. If the WMA includes multiple waste management facilities, is each facility adequately monitored? N/A___ YES___ NO ✓

5. Does the facility have a **GW Sampling and Analysis Plan**? YES___ NO ✓
   Does it adequately address:
   a. Sample collection procedures YES___ NO ✓
   b. Sample preservation and shipment YES___ NO ✓
   c. Analytical procedures YES___ NO ✓
   d. Chain of custody procedures YES___ NO ✓

6. Does the facility have an adequate **GW Quality Assessment Plan Outline**? YES___ NO ✓

7. If the company is performing an alternate groundwater monitoring program or a partial waiver monitoring program, is an approved Sampling and Analysis Plan followed? N/A___ YES___ NO ✓

NOTE: Complete the "GW Sampling Procedures Checklist", when observing well sampling procedures or co-sampling monitor wells at the facility.

*** An entry in this column indicates explanation/response is needed.

TWC Reg. No. 3324D

TWC Solid Waste Inspection Report
(CFR 265.170-177)
CONTAINER STORAGE AREA CHECKLIST

Reg. Facility No. 01

Class of Wastes (H, NH)

				***
1.	Are containers in good condition?		YES ✓	NO ___
2.	Are the containers compatible with the wastes being stored?		YES ✓	NO ___
3.	Are containers kept closed and stored in a safe manner?		YES ___	NO ✓
4.	Are containers inspected weekly for leakage and deterioration?		YES ✓	NO ___
*5.	Are containers holding **ignitable** or **reactive** wastes kept at least 15 meters (50 ft) from the facility's property line?	N/A ___	YES ✓	NO ___
6.	Are containers holding **incompatible** wastes separated by a physical barrier **or** sufficient distance?	N/A ✓	YES ___	NO ___
7.	Does the storage area have containment protection?		YES ___	NO ✓

Describe Container Storage Area: The container storage area consisted of a 14'x25' shed attached to the end of a product storage building. The shed was roofed with a concrete slab floor. The storage building formed a wall on one side of the shed. The other sides were open. Used oils were being stored in square metal containers. Spent Solvents were being stored in 55-gallon drums.

NOTE: 90-Day accumulation rules are in TAC 335.69.
Point-of-generation (satellite) accumulation rules are in TAC 335.69(d) & (e).

* Not Applicable to Small Quantity Generators.
*** An entry in this column indicates explanation/response is needed.

04/86

TWC Reg. No. 33240

Checklist Container Storage

COMMENTS SHEET

Section 3 / One spent solvent drum was not properly closed. TAC 335.112, 40 CFR 265.173(a). Mr. Bond was instructed to have the drum properly closed. No leakage or spillage was noted.

Section /

Section /

Section /

TWC Reg. No. 33240

TWC Solid Waste Inspection Report

Reg. Facility NO. not register

SURFACE IMPOUNDMENT CHECKLIST

Class of Waste (H, NH) comment

Use of Impoundment: Treatment___ Storage ✓ Disposal___ comment

Type of Waste: metal cleaning waste

Type of Liner: natural clay liner

Is there a Leachate collection and removal system? YES___ NO ✓

Does owner/operator intend to "clean close" the impoundment at Closure? YES ✓ NO___
(i.e., remove all hazardous liquids and sludges)

A. GENERAL OPERATING AND CONTAINMENT REQUIREMENTS ***

1. Is there at least 2 ft. (60 cm) of freeboard? YES ✓ NO___

2. Is there evidence of overtopping of the dikes? NO ✓ YES___

3. Is there evidence of dike seepage, erosion or instability? NO___ YES ✓

4. Do earthern dikes have protective cover to minimize erosion? N/A___ YES___ NO ✓

B. WASTE ANALYSIS AND TRIAL TESTS

1. If impoundment is used to treat or store **substantially different** wastes:

   a. Are waste analyses and trial treatment or storage tests done on these different wastes?
   or
   Is there written, documented information on similar treatment or storage of similar wastes? N/A ✓ YES___ NO___

   b. Are records available of these waste analyses in the operating record? N/A ✓ YES___ NO___

C. INSPECTION REQUIREMENTS

1. Is the impoundment **freeboard** inspected daily? Comment NA YES___ NO___

2. Is the impoundment, dike, and surrounding vegetation inspected weekly for leaks, deterioration, or failures? NA YES___ NO___

*** An entry in this column indicates explanation/response is needed

D. SPECIAL REQUIREMENTS

1. If **ignitable** or **reactive** wastes are placed in the impoundment: (circle)

a. Are they rendered non-ignitable or non-reactive ***

or

b. Protected from sources of ignition or reaction? N/A ✓ YES___ NO___

NOTE: N/A if impoundment is used solely for emergencies.

2. **If** the impoundment is used to hold **incompatible** wastes:

Are they handled so as to prevent violent reactions, toxic or flammable gases, damage to the impoundment, or threat to humans or the environment? N/A ✓ YES___ NO___

E. GROUND WATER MONITORING

1. Does the impoundment have a RCRA groundwater monitoring system? (Use GWM checklist if applicable) N/A___ YES___ NO ✓

F. HSWA REQUIREMENTS

1. Is the impoundment a "**new unit**"*, a replacement of an existing unit, or a lateral expansion of an existing unit? YES ✓ NO___ comment

If Yes:

a. Has impoundment received haz. waste since May 1985? N/A___ YES___ NO ✓

b. Does the impoundment have two or more liners and a leachate collection system between such liners? N/A___ YES___ NO ✓

Capacity & Dimensions: 520' x 200' + triangular area 80' x 200' on the sides

Surface area 112,000 square feet

Comments:

*A surface impoundment that first received hazardous waste after Nov. 8, 1984.

TWC Reg. No. 33240

Checklist Surface Impoun

COMMENTS SHEET

Section Class of Waste / Un-neutralized metal cleaning waste, which was hazardous due to low pH, was inadvertently placed in the pond during the initial startup of the plant. The waste is normally neutralized before being placed in the pond. The neutralized waste would likely be Class IN H or Class II. Neutralized metal cleaning waste is discharged through a NPDES outfall with pH, TSS, oil and grease, Cu^{++}, and Fe limitations.

Section Impoundment Use / The impoundment was designed to hold nonhazardous metal cleaning waste. The hazardous waste, which was inadvertently placed in the pond, was neutralized and discharged. pH measurements (taken during the 4/30/86 sampling inspection) of the sludge and liner showed nonhazardous pH levels following neutralization of the waste. The pond was inactive at the time of the inspection.

Section A3 / The insides of the dike surrounding the impoundment were eroded. TAC 335.112 / 40 CFR 265.223.

Section A4 / The dikes did not have protective cover. TAC 335.112 / 40 CFR 265.223.

REFERENCE 12

TXWDBD 150 ✓

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REPORT 27

GROUND-WATER RESOURCES OF HARRISON COUNTY, TEXAS

AUGUST 1966

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TEXAS WATER DEVELOPMENT BOARD

REPORT 27

GROUND-WATER RESOURCES OF HARRISON COUNTY, TEXAS

By

M. E. Broom and B. N. Myers
United States Geological Survey

Prepared by the U.S. Geological Survey
in cooperation with the
Texas Water Development Board
and the
Harrison County Commissioners Court

GROUND-WATER RESOURCES OF HARRISON COUNTY, TEXAS

ABSTRACT

Harrison County is in the northeastern part of Texas and has an area of 892 square miles. Marshall, the county seat, is 40 miles west of Shreveport, 150 miles east of Dallas, and 75 miles south of Texarkana. Most of Harrison County is heavily forested and the surface is hilly to rolling. The average annual precipitation is about 47 inches.

The economy of the county is based chiefly on industry and agriculture. The agricultural economy is based principally on the raising of beef cattle. The principal industries are concerned with the production and processing of oil and gas.

The geologic units that are the principal source of ground-water in Harrison County consist of the Wilcox Group, the Carrizo Sand, the Reklaw Formation, and the Queen City Sand, all of Eocene age. These units are, for the most part, hydraulically interconnected and generally function as a single aquifer; the aquifer is herein referred to as the Cypress aquifer. The aquifer, which thickens from about 200 feet along the eastern border of Harrison County to about 900 feet in the southwest corner of the county, consists principally of lenticular beds of sand, silt, and clay. The outcrop area of the Cypress aquifer includes practically all of the land surface area of Harrison County.

The Cypress aquifer contains a large quantity of fresh to slightly saline water in storage--the upper 400 feet of the aquifer contains an estimated 17 million acre-feet of water that can be developed economically.

The aquifer is recharged mainly from the rather heavy precipitation which falls on the county. At least 55,000 acre-feet (49.1 mgd), and perhaps significantly more, is available annually for development without depleting the aquifer. Of this total, at least 40,000 acre-feet (35.7 mgd), which might be salvaged, is rejected to streams from the outcrop of the aquifer. Salvage of a sizeable percentage of this water would require a large number of closely spaced small-capacity wells.

The ground-water supplies in Harrison County are virtually untapped. Of the 34 million acre-feet of ground water in transient storage, only about 2,700 acre-feet was pumped from the Cypress aquifer in 1964. Obviously, the present rate of ground-water withdrawal could be increased substantially.

The water in the aquifer generally is fresh (less than 1,000 parts per million dissolved solids) although in the deeper part of the aquifer the water

is slightly saline (1,000 to 3,000 parts per million dissolved solids). Excessive concentrations of dissolved iron, however, exist at generally predictable zones within the aquifer, and by discriminate well construction and pumping practices, the excessive concentrations of dissolved iron can be avoided.

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GROUND-WATER RESOURCES OF HARRISON COUNTY, TEXAS

INTRODUCTION

Location and Extent of Area

Harrison County, in the northeast Texas pine-hardwood timber belt, is bordered by Louisiana on the east, Panola and Rusk Counties on the south, Gregg and Upshur Counties on the west, and Marion County on the north (Figure 1). County boundaries coincide or lie within the main channels of the Sabine River in the southwest and Cypress Creek in the northeast.

Harrison County comprises an area of 892 square miles or approximately 570,000 acres. About 333,000 acres of the county is classified as forest land and about 200,000 as crop and pasture land.

Marshall, the county seat and center of commerce, is 40 miles west of Shreveport, 150 miles east of Dallas, and 75 miles south of Texarkana.

Purpose and Scope of Investigation

The potential economic growth of northeast Texas amply justifies the search for up-to-date information on all the natural resources of the area. Toward this aim and through a cooperative program of the Harrison County Commissioners Court, the Texas Water Development Board, and the U.S. Geological Survey, a ground-water resources investigation of Harrison County was begun in March 1964.

The results of the investigation are contained in this report and generally deal with the source, distribution, availability, quality, and quantity of ground water in Harrison County. Emphasis is placed on the sources and quantity of ground water suitable for public supply, industrial, and irrigation use. Many of the data on which the report was based were obtained through the generous assistance of the landowners and county, municipal, and industrial officials.

Specific objectives of the investigation were:

1. To describe the thickness and extent of the water-bearing material.
2. To delineate those areas within the county that appear most favorable for the development of ground-water supplies suitable for municipal, industrial, and irrigation use.

3. To estimate the quantity of ground water available.

4. To determine the vertical and lateral variations in the quantity and quality of the ground-water supplies.

5. To determine the hydraulic characteristics of the water-bearing materials.

6. To estimate the yields and other characteristics of wells that might be drilled in the county.

7. To evaluate any problems related to the development of the ground-water supplies or that may result from surface or subsurface disposal of brine from oil fields in the area.

Methods of Investigation

The principal items of work to meet the objectives of the investigation were as follows:

1. An inventory was made of 232 water wells, 76 oil tests, and 2 springs, including all public supply, industrial, and irrigation wells (Table 5). The locations of the inventoried wells and springs are shown on Figure 11.

2. The electric logs of 76 oil or gas tests (Table 5) were used for correlation purposes and for a study of the water-bearing properties of the geologic formations. The locations of these tests are shown on Figure 11.

3. Approximately 100 drillers' logs and several electric logs of water wells were studied. The drillers' logs of seven representative wells from various parts of the county are shown in Table 6.

4. An inventory was made of the quantities of ground water used for public supply, industry, and irrigation; an estimate was made of the quantities used for domestic and livestock purposes (Table 3).

5. Aquifer tests were made in five wells to determine the hydraulic characteristics of the water-bearing material (Table 2).

6. Analyses of samples of water, collected during the current and past investigations, were used to determine the chemical quality of the ground water (Tables 7 and 8).

7. A map showing the altitude of the base of the fresh to slightly saline water-bearing material in Harrison County was compiled from electric logs (Figure 3).

8. A map showing the approximate thickness of the sand containing fresh to slightly saline water in the principal aquifer was made from electric logs (Figure 10).

9. Two geologic cross sections were made from electric logs (Figure 4).

10. The hydrologic data were analyzed to determine the quantity and quality of ground water available for development.

11. Problems related to the development of ground-water supplies in the county were studied.

Physiography and Climate

Harrison County is in the West Gulf Coastal Plain (Fenneman, 1938, p. 100). The surface of the county is gently rolling to hilly and in general rises from east to west. Altitudes range from about 170 feet above sea level in the vicinity of Caddo Lake to about 600 feet about 8 miles west of Marshall; the average altitude is about 375 feet.

The northern one-half of the county is drained by Cypress Creek and its tributaries, and the southern half is drained by the Sabine River. The drainage divide trends roughly eastward through Marshall, thence southeastward.

Continuous records of streamflow on any stream within or bordering the county are scarce. The U.S. Army Corps of Engineers maintained a stream-gaging station near Jefferson on Little Cypress Creek (Figure 11) from 1946 to 1964 when the station was abandoned. The U.S. Geological Survey established a gaging station at approximately the same location in 1963. The combined streamflow records dating from 1946 through 1964 show an average annual discharge of Little Cypress Creek, with a drainage area of 675 square miles, to be 546 cfs (cubic feet per second) or about 394,000 acre-feet per year. For the period of record, the lowest average monthly flow (48.7 cfs) occurs in August, and the highest average monthly flow (1,258 cfs) in May.

The character of the precipitation and runoff and the favorable topography make feasible rather extensive development of the surface-water resources of Harrison County. As of January 1, 1965, approximately 4,000 small reservoirs, from $\frac{1}{2}$ acre to 40 acres in size, have been constructed principally for livestock water supplies. Several large-capacity reservoirs have been constructed for industrial and recreational uses.

Records of the U.S. Weather Bureau at Marshall, dating from 1933, show that the normal annual precipitation at Marshall is 46.96 inches, and the normal monthly precipitation, in inches, is:

Jan.	4.75	May	5.25	Sept.	2.70
Feb.	4.01	June	3.18	Oct.	3.01
Mar.	4.40	July	3.28	Nov.	4.41
Apr.	4.43	Aug.	2.53	Dec.	5.01

The normal January temperature is 47.1°F, and the normal July temperature is 83.8°F. The average date of the first killing frost is November 12 and the last is March 19. The mean annual growing season is 238 days. In Thornthwaite's (1952, p. 25-35, fig. 30) classification of the climate, Harrison County is humid.

Population and Economy

According to the U.S. Bureau of the Census, Harrison County had a population of 45,594 in 1960. The populations in 1960 of the principal cities and communities are: Marshall, 24,900 (1964 estimate); Waskom, 1,336; Karnack, 700; Hallsville, 684; Harleton, 300; Scottsville, 260; Elysian Fields, 250; and Uncertain, 200.

The economy of Harrison County is based principally on industry and agriculture. The principal industries are concerned with the production, processing, and distribution of oil and gas. Other industries of significance include: the mining of lignite, and production of activated carbon (Atlas Chemical Industries, Inc.); the mining of clay, and production of brick and pottery; and the production of solid-fuel rocket motors (Thiokol Chemical Corp. under the facilities of the Longhorn Army Ammunition Plant). Also, timber cutting and the production of wood products contribute significantly to the economy of Harrison County.

The raising of beef cattle, which has increased during recent years, has become the most important part of the agricultural economy. Resulting increases have therefore occurred in the production of feed crops (such as corn, grain sorghum, and hay), and in the conversion of timbered areas and row croplands to pasture. Dairying is followed in importance by poultry and swine production. The raising of cotton, vegetables, nuts, and fruits is likewise important locally.

Previous Investigations

Detailed studies of the ground-water resources of Harrison County have not been made prior to this investigation. Broadhurst and White (1942) discussed the water supplies available in the southwest corner of Harrison County. The water resources of Harrison County were described by Broadhurst and Breeding (1943). The report included a chapter on the supply of surface water available in the county from the Sabine River and Little Cypress Creek as well as the records of wells and springs, drillers' logs of selected wells, and the results of chemical analyses of water from wells and springs. The public water supplies of Hallsville, Karnack, Marshall, and Waskom were included in an inventory of the public water supplies in eastern Texas by Sundstrom, Hastings, and Broadhurst (1948, p. 150-154). A reconnaissance report on the ground-water resources of the Red River, Sulphur River, and Cypress Creek basins by E. T. Baker and others (1963), and one on the Sabine River basin by B. B. Baker and others (1963), contain information on Harrison County.

Well-Numbering System

The well-numbering system used in this report is one adopted by the Texas Water Development Board for use throughout the State and is based on latitude and longitude. Under this system, each 1-degree quadrangle in the State is given a number consisting of two digits. These are the first two digits appearing in the well number. Each 1-degree quadrangle is divided into $7\frac{1}{2}$-minute quadrangles which are also given 2-digit numbers from 01 to 64. These are the third and fourth digits of the well number. Each $7\frac{1}{2}$-minute quadrangle is subdivided into $2\frac{1}{2}$-minute quadrangles and given a single digit number from 1 to 9. This is the fifth digit of the well number. Finally, each well within a $2\frac{1}{2}$-minute quadrangle is given a 2-digit number in the order in which it is inventoried, starting with 01. These are the last two digits of the well number. In addition to the 7-digit well number, a 2-letter prefix is used to identify the county.

The prefix for Harrison County is LK. All of Harrison County falls within the 1-degree quadrangle 35. So the first two digits of all well numbers in the county is 35. Harrison County covers all or part of twenty-one $7\frac{1}{2}$-minute quadrangles. On the well-location map of this report (Figure 11), the $7\frac{1}{2}$-minute quadrangles are numbered in the northwest corner of each quadrangle. The 3-digit number shown at each well is the number of the $2\frac{1}{2}$-minute quadrangle in which the well is located and the number of the well within the quadrangle.

Thus, well LK-35-30-701 (a standby industrial well at Marshall) is in Harrison County (LK), in the 1-degree quadrangle number (35), in the $7\frac{1}{2}$-minute quadrangle (30), in the $2\frac{1}{2}$-minute quadrangle (7), and was the first well (01) inventoried in that $2\frac{1}{2}$-minute quadrangle.

GEOLOGY AS RELATED TO THE AVAILABILITY OF GROUND WATER

The geologic units pertinent to the ground water in the report area range in age from Paleocene to Recent. Their thickness, lithology, age, and water-bearing properties are summarized in Table 1. The geologic units crop out in belts that trend generally northeasterly across Harrison County and into adjacent counties (Figure 2).

The report area lies on the northwest flank of the Sabine Uplift, which crests along the Texas-Louisiana border. Consequently, the geologic units, except the Quaternary deposits, generally dip and thicken northwest toward the axis of the East Texas basin in contrast to the eastward slope of the land surface.

The availability of ground water in Harrison County is dependent entirely on the hydrologic characteristics of the geologic units overlying the Midway Group--chiefly those units which, in ascending order, comprise the Wilcox Group, the Carrizo Sand, the Reklaw Formation, and the Queen City Sand.

Following, in ascending order, are the Weches Greensand and the Sparta Sand, which occur only as outliers capping several ridges in the northwestern part of the county. These units, as well as the Quaternary terrace and alluvial materials which occur along and in the major stream flood plains of the county, provide only small quantities of fresh water to a few shallow wells. Consequently, the following discussions are devoted principally to those units--the Wilcox Group, Carrizo Sand, Reklaw Formation, and Queen City Sand--that furnish nearly all the ground water pumped in the county.

The Wilcox Group crops out over a large part of the eastern half of Harrison County (Figure 2). The group has a maximum thickness of about 700 feet and consists mostly of fine to medium sand interbedded with considerable amounts of clay and seams of lignite. Thick sand beds are present locally; however, the individual sand beds are not continuous, and therefore are difficult to correlate between wells, even wells a short distance apart. Thin beds of limonite are common on the surface. The Wilcox yields small (less than 50 gallons per minute) to moderate (50 to 500 gallons per minute) quantities of fresh water (less than 1,000 parts per million dissolved solids) to wells throughout the county. For practical purposes, the base of the Wilcox is approximately the base of fresh water, although slightly saline water (1,000 to 3,000 parts per million dissolved solids) can be obtained in the deeper parts of the aquifer.

The Carrizo Sand crops out in a narrow crescent-shaped belt across the east-central and southern parts of the county (Figure 2). The Carrizo has a maximum thickness of about 100 feet and consists chiefly of fine to medium sand, silt, and clay. In general, the Carrizo is difficult to distinguish from sand of the Wilcox Group below and the Reklaw Formation above. Where wells are known to tap the Carrizo, it yields small to moderate quantities of fresh to slightly saline water.

The Reklaw Formation crops out in a belt of variable width adjoining the outcrop of the Carrizo Sand on the west and northwest (Figure 2). The formation consists of clay and fine glauconitic and quartzitic sand, locally cross-bedded; thin beds of limonite are common in the outcrop. The Reklaw has a maximum thickness of about 100 feet and is capable of furnishing at least small amounts

Table 1.--Geologic units and their water-bearing properties, Harrison County

Table 1.--Geologic units and their water-bearing properties, Harrison County

System	Series	Group	Unit	Approximate maximum thickness (feet)	Character of rocks	Water-bearing properties
aternary	Recent and Pleistocene		Alluvium and terrace deposits (undivided)	50	Predominantly clay, silt, and fine sand. Terrace material locally fine to coarse sand.	Yields small quantities of water to a few wells
·tiary	Eocene	Claiborne	Sparta Sand	25	Fine sand and sandy clay. Limonitic ironstone seams common in outcrop area.	Do.
			Weches Greensand	50	Fine to medium sand, glauconitic and quartzitic, laminar to cross-bedded. Limonitic ironstone seams and concretions common in outcrop area.	Do.
			Queen City Sand	200	Very fine to medium sand, quartzitic, interbedded with silt and clay, laminar to cross-bedded. Contains minor amounts of lignite. Limonitic ironstone seams common in outcrop area	Cypress aquifer
			Reklaw Formation	100	Clay and fine sand, glauconitic and quartzitic, mostly laminar but locally cross-bedded. Locally contains marine fossils. Limonitic ironstone seams common in outcrop area.	
			Carrizo Sand	100	Fine to medium sand interbedded with silt and clay. Laminar to cross-bedded. Limonitic ironstone seams common in outcrop area.	
		Wilcox		700	Fine to medium sand interbedded with considerable amounts of clay. Commonly contains seams of lignite. Limonitic ironstone seams common in outcrop area.	
	Paleocene	Midway		900	Predominantly marine clay; becomes silty in upper part.	Not known to yield fresh water in Harrison County.

The Queen City Sand crops out in a large part of the northwestern quarter of the county (Figure 2) and consists of very fine to medium sand interbedded with silt and clay and impure lignite. Limonite forms on the weathered outcrops of the Queen City. The sand is typically lenticular and cross-bedded. The Queen City has a maximum thickness of about 200 feet and yields moderate quantities of fresh to slightly saline water to wells.

CYPRESS AQUIFER

General Physical Features

An aquifer is defined as a geologic formation, group of formations, or a part of a formation that is water bearing. In the report area, the Wilcox Group, Carrizo Sand, Reklaw Formation, and Queen City Sand are, for the most part, hydraulically interconnected and generally function as a single aquifer. The aquifer is herein referred to as the Cypress aquifer and is approximately equivalent to the Cypress aquifer in Camp, Franklin, Morris, and Titus Counties as defined by Broom and Alexander (1965, p. 23-24).

The outcrop of the Cypress aquifer in Harrison County includes about 900 square miles, or nearly all the land surface of Harrison County. The thickness of the Cypress aquifer ranges from about 200 feet along the eastern boundary of the county to about 900 feet in the southwestern part of the county. The base of the aquifer, which also is the base of the Wilcox Group and approximately the base of fresh water, slopes westward, ranging from an altitude of 193 feet above sea level in the east-central part of the county to more than 750 feet below sea level in the northwest corner of the county (Figure 3).

The rock materials comprising the Cypress aquifer, particularly the sand and clay, are not uniformly distributed laterally or vertically; thus, correlation of individual sand and clay beds from well to well is difficult. In general, the beds are lenticular, the lenses of clay, sand, and silt pinching out, coalescing, or grading into each other within short distances. The range in thickness of individual beds and the discontinuity of the beds are shown on the geologic sections (Figure 4), which were constructed from electric logs. On the logs, the sand beds are represented by high resistivities and the clay and silt beds by low resistivities.

Source and Occurrence of Ground Water

The source of ground water in the Cypress aquifer is precipitation on the outcrop of the aquifer in Harrison County. Much of the water from precipitation is evaporated at the land surface, transpired by plants, or retained by capillary forces in the soil; a small part percolates downward by gravity through the zone of aeration to the zone of saturation (or the level at which all the voids or pore spaces are saturated).

Ground water occurs under unconfined or water-table conditions and confined or artesian conditions. Unconfined water occurs where the upper surface of the zone of saturation is under atmospheric pressure only, and the water is free to rise or fall in response to the changes in the volume of water in storage. The

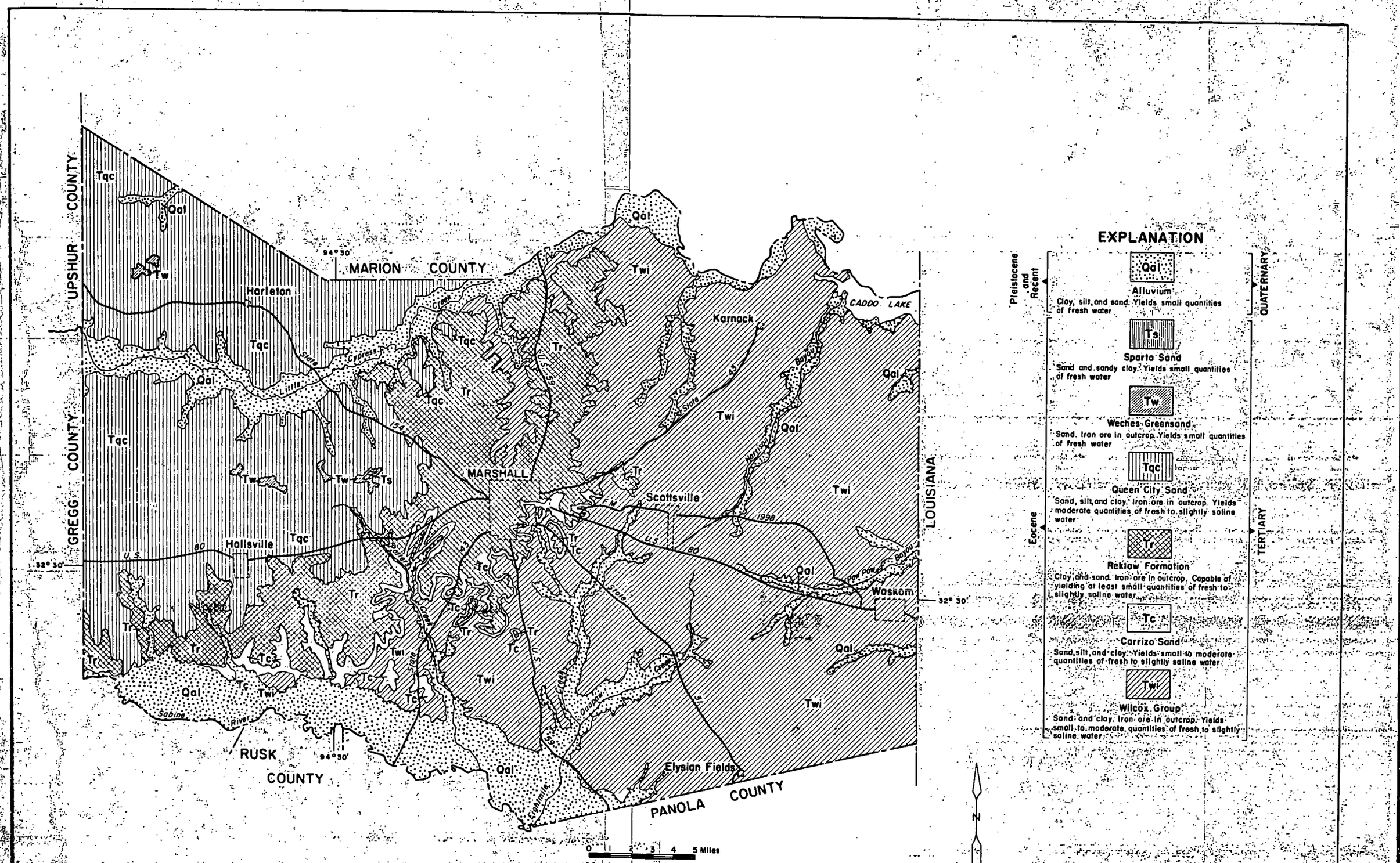
UPSHUR COUNTY
GREGG COUNTY
MARION COUNTY
RUSK COUNTY
PANOLA COUNTY
LOUISIANA
CADDO LAKE
Harleton
MARSHALL
Scottsville
Hallsville
Karnack
Waskom
Elysian Fields
94° 30'
32° 30'
Tqc
Qal
Tw
Ts
Tr
Tc
Twi
0 1 2 3 4 5 Miles
N
EXPLANATION
QUATERNARY
Pleistocene and Recent
Qal
Alluvium
Clay, silt, and sand. Yields small quantities of fresh water
TERTIARY
Eocene
Ts
Sparta Sand
Sand and sandy clay. Yields small quantities of fresh water
Tw
Weches Greensand
Sand, iron ore in outcrop. Yields small quantities of fresh water
Tqc
Queen City Sand
Sand, silt, and clay. Iron ore in outcrop. Yields moderate quantities of fresh to slightly saline water
Tr
Reklaw Formation
Clay and sand. Iron ore in outcrop. Capable of yielding at least small quantities of fresh to slightly saline water
Tc
Carrizo Sand
Sand, silt, and clay. Yields small to moderate quantities of fresh to slightly saline water
Twi
Wilcox Group
Sand and clay. Iron ore in outcrop. Yields small to moderate quantities of fresh to slightly saline water

Figure 2

penetrating an aquifer under water-table conditions becomes filled with water to the level of the water table. Water-table conditions occur in the outcrop area of the geologic units that comprise the Cypress aquifer.

Confined or artesian water occurs where an aquifer is overlain by rocks of lower permeability, such as clay, that confines the water under a pressure greater than that of the atmosphere. Such artesian conditions occur generally downdip from the outcrop of the geologic units of the Cypress aquifer. A well penetrating sands under artesian pressure becomes filled with water to a level above the base of the confining rock; and, if the pressure head is large enough to cause the water in the well to rise to an altitude greater than that of the land surface, the well will flow. The level (or surface) to which water will rise in artesian wells is called the piezometric surface. Although the terms "water table" and "piezometric surface" are synonomous in the outcrop area of the aquifer, the piezometric surface, as used in this report, is applicable only in the artesian area.

Recharge, Movement, and Discharge of Ground Water

Aquifers may be recharged by either natural or artificial processes. Natural recharge results from the infiltration of precipitation, either where it falls or from runoff en route to a watercourse, and from the infiltration of water from streams or lakes. Artificial recharge processes include infiltration of irrigation water, industrial waste water, or sewage. Improperly treated waste water and sewage may pollute the supply of fresh ground water, especially at shallow depths.

Among the more important factors governing the rate of natural recharge are the type of soil, the duration and intensity of rainfall, the slope of the land surface, the presence or absence of a cover of vegetation, and the position of the water table. The sandy soil on the outcrop of the Cypress aquifer is favorable to recharge. In general, the greater the precipitation on the outcrop area of the aquifer, the greater the recharge; but the duration and intensity of rainfall are also factors of considerable importance. A given amount of rainfall during a short period usually results in less recharge than the same amount of rainfall during a longer period. Also, the rate of recharge can be greater during the winter months when plant growth is at a minimum and the evaporation rate is lower.

Although the quantity of recharge to the Cypress aquifer has not been determined, an estimate of the minimum figure available for recharge can be made. The water table in the outcrop or recharge area of the aquifer lies at an altitude above the base of the streams in most areas, and the water table is intersected by the major streams. As a result of the position of the water table, some of the water that enters the aquifer in the outcrop area moves to the stream valleys and is discharged as seep and spring flow in the outcrop area. This is actually a form of discharge from the aquifer, but for purposes of this report, it is referred to as rejected recharge in that the water did not reach the deeper part of the aquifer below the level of the streams. Part of the discharge in the outcrop area is consumed by evapotranspiration in the stream valleys; the remainder maintains the low flow of the streams in the area.

On the basis of low flow of Little Cypress Creek (tributary to Cypress Creek) measured at two gaging stations, one near Ore City in Gregg County and the other near Jefferson in Harrison County (Figure 11), and on the basis of a low-flow investigation of Potters Creek (tributary to the Sabine River), the volume of flow contributed to the streams by rejected recharge is about 40,000 acre-feet per year or 35.7 mgd (million gallons per day). This figure is conservative because it does not include the water that has been consumed by evapotranspiration. The quantity of water that becomes recharge can be estimated knowing the transmissibility of the aquifer and the approximate hydraulic gradient. On the basis of estimates of these values, the quantity moving through the aquifer under the present gradient (5 feet per mile) is approximately 15,000 acre-feet per year, or 13.4 mgd.

Ground water moves through the sand beds in the Cypress aquifer from areas of recharge to areas of discharge at a slow rate, perhaps a few hundred feet per year. The force of gravity is responsible for the initial infiltration and the downward movement of the water to the zone of saturation. After reaching the zone of saturation, the movement of the water generally has a large horizontal component in the direction of decreasing pressure (or head). The movement is, however, rarely uniform in direction or velocity. The flow is greatest along routes of least resistance, such as unconsolidated sand, and least in masses of sediment having relatively low permeability, such as cemented sand or clay.

The general direction of movement as well as the hydraulic gradient of the water in the Cypress aquifer in the report area are shown by a contour map (Figure 5) of the piezometric surface. The map does not reflect the altitude of water levels in a particular geologic unit comprising the aquifer, but rather a composite of the water levels of the units tapped. Thus, the water level at any particular location may be somewhat different than that shown on the map. The movement, which is at right angles to the contours, generally is toward the major streams. According to the contours, the ground water moves outwardly from a mound at Marshall. In the western part of the county, some water moves eastward to a trough that trends northeast through Hallsville; thence the water moves northward to Cypress Creek and southward to the Sabine River.

The water in the Cypress aquifer is discharged both naturally and artificially. The natural discharge is the flow of springs and seeps, evaporation from the water table, and transpiration by trees and plants whose roots reach the water table. The discharge from springs and seeps (rejected recharge) was estimated previously at a minimum of 40,000 acre-feet per year, or 35.7 mgd. The discharge by evaporation and transpiration is not known, but the quantity is large because of the shallow depth to the water table and the great density of vegetation. The artificial discharge of ground water is from flowing or pumped wells. This quantity was about 2,700 acre-feet in 1964.

Hydraulic Characteristics

When water is discharged from an aquifer through a well, a hydraulic gradient in the water table or piezometric surface is established toward the well. When a well is pumped or allowed to flow, the level of the water table or piezometric surface is lowered; the difference between the discharging level and the static level (water level before pumping or before start of flow) is

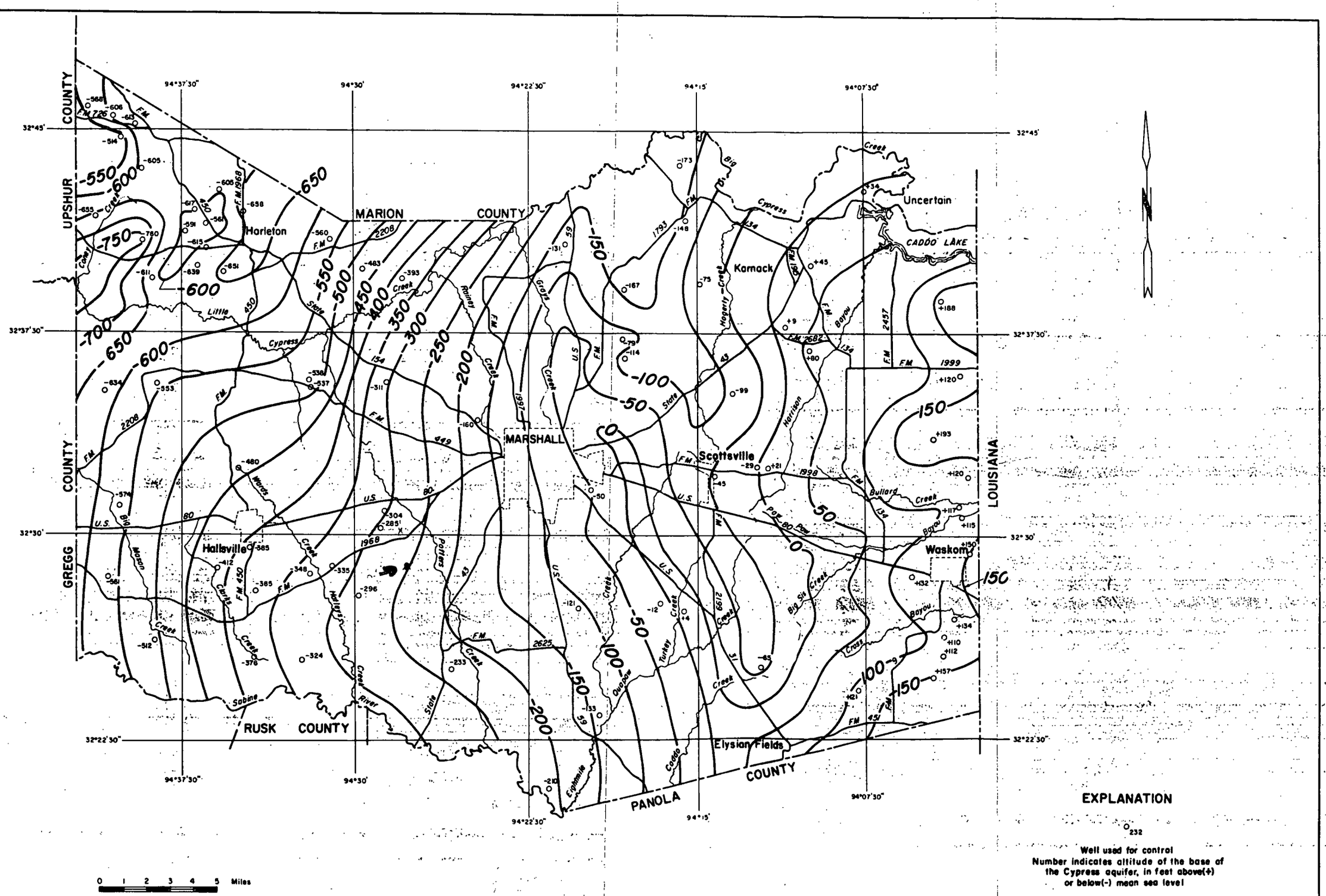
UPSHUR COUNTY
MARION COUNTY
GREGG COUNTY
RUSK COUNTY
PANOLA COUNTY
LOUISIANA
MARSHALL
Harleton
Hallsville
Karnack
Scottsville
Uncertain
CADDO LAKE
Waskom
Elysian Fields
94°37'30"
94°30'
94°22'30"
94°15'
94°07'30"
32°45'
32°37'30"
32°30'
32°22'30"
EXPLANATION
Well used for control
Number indicates altitude of the base of the Cypress aquifer, in feet above(+) or below(-) mean sea level
Structure Contour
Drawn at the base of the Cypress aquifer
Contour Interval 50 feet
0 1 2 3 4 5 Miles

Figure 3

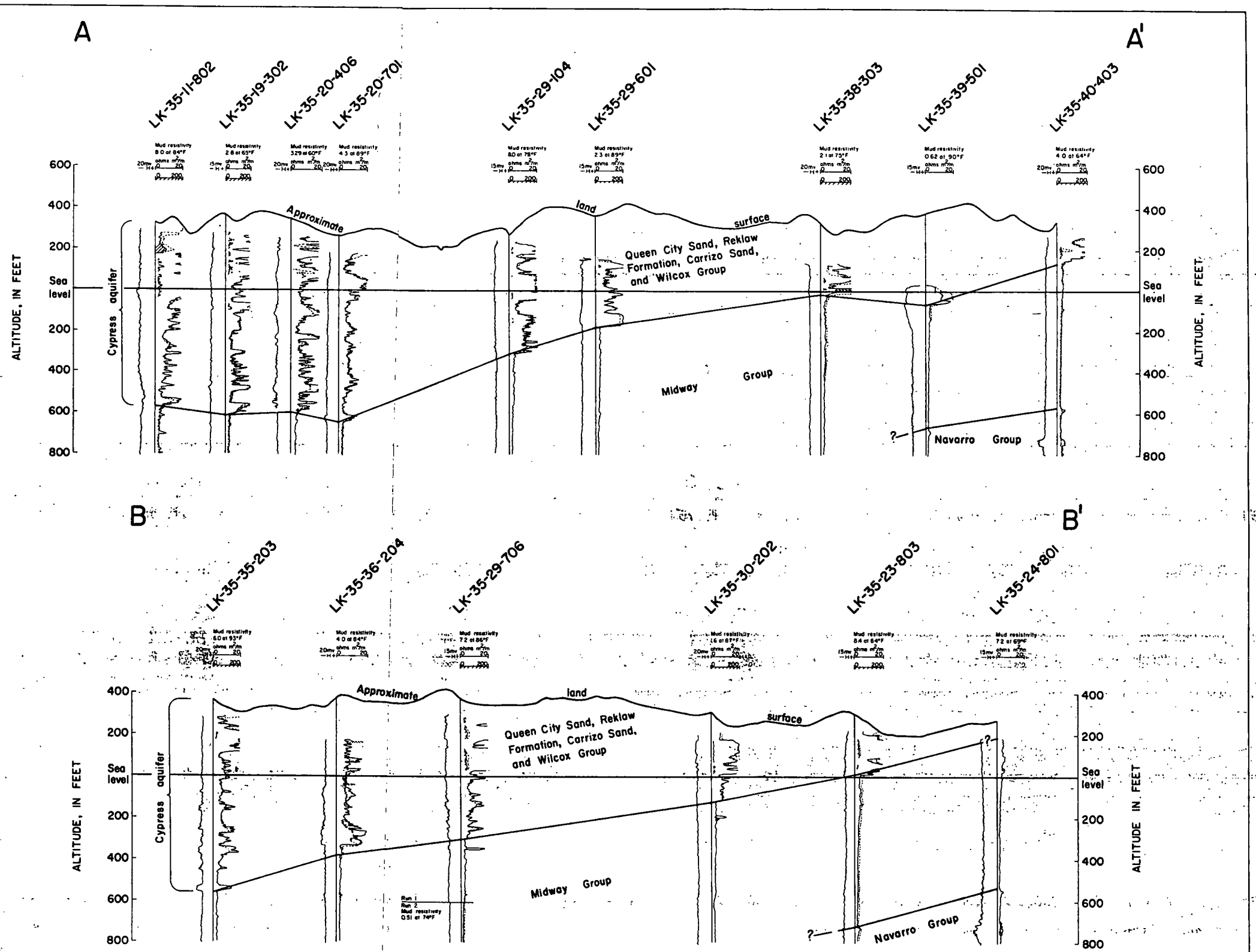
A
A'
LK-35-11-802
LK-35-19-302
LK-35-20-406
LK-35-20-701
LK-35-29-104
LK-35-29-601
LK-35-38-303
LK-35-39-501
LK-35-40-403
Approximate land surface
Queen City Sand, Reklaw Formation, Carrizo Sand, and Wilcox Group
Cypress aquifer
Midway Group
Navarro Group
ALTITUDE, IN FEET
Sea level
B
B'
LK-35-35-203
LK-35-36-204
LK-35-29-706
LK-35-30-202
LK-35-23-803
LK-35-24-801
Approximate land surface
Queen City Sand, Reklaw Formation, Carrizo Sand, and Wilcox Group
Cypress aquifer
Midway Group
Navarro Group
ALTITUDE, IN FEET
Sea level
HARRISON COUNTY
MARSHALL
Miles

Figure 4

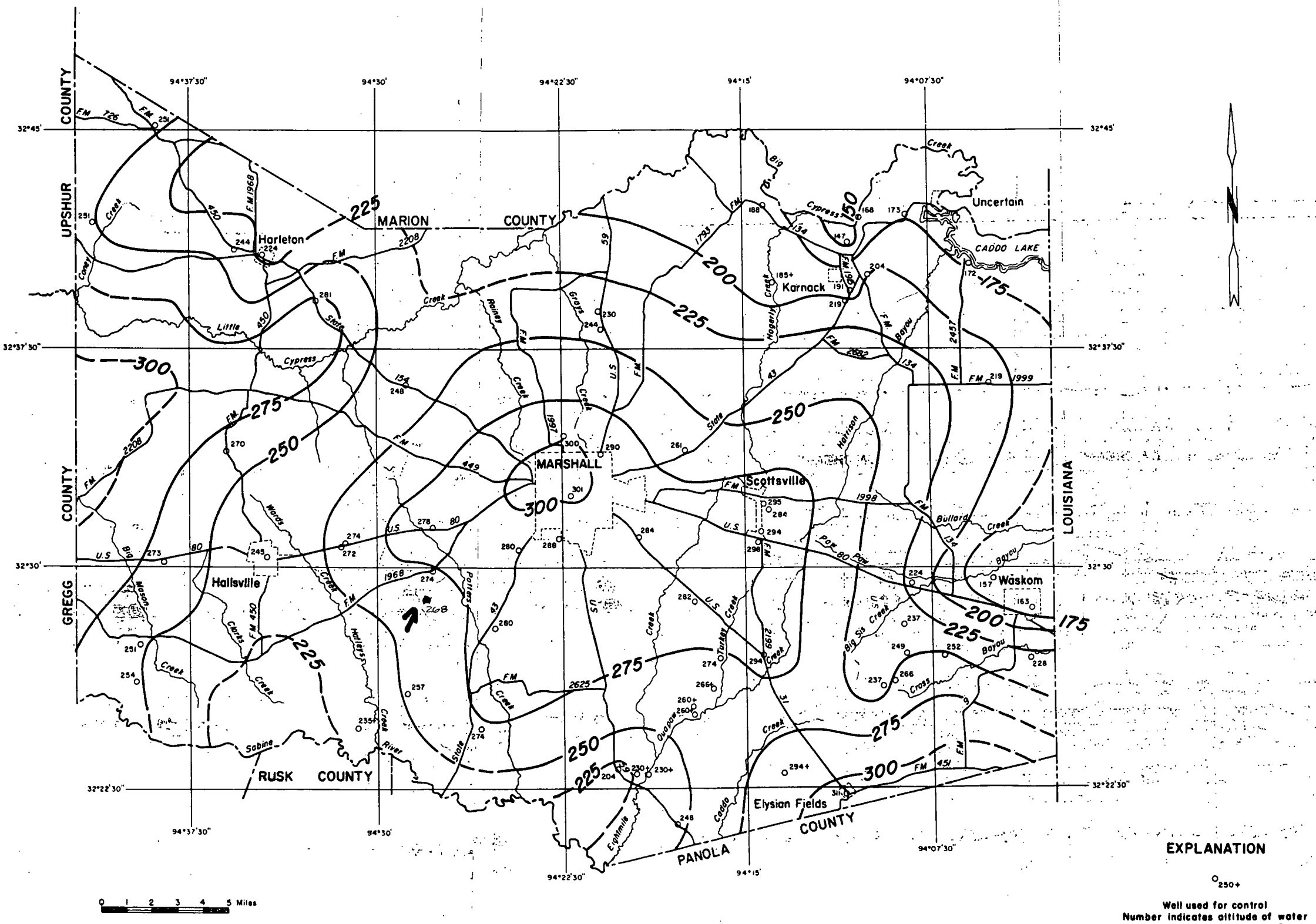
UPSHUR COUNTY
MARION COUNTY
GREGG COUNTY
RUSK COUNTY
PANOLA COUNTY
LOUISIANA
Harleton
Karnack
Uncertain
CADDO LAKE
MARSHALL
Scottsville
Hallsville
Waskom
Elysian Fields
94°37'30"
94°30'
94°22'30"
94°15'
94°07'30"
32°45'
32°37'30"
32°30'
32°22'30"
0 1 2 3 4 5 Miles
EXPLANATION
250+
Well used for control
Number indicates altitude of water level, in feet above sea level. Plus sign indicates altitude is more than number shown

Figure 5

the drawdown. The water table or piezometric surface surrounding a discharging well assumes more or less the shape of an inverted cone which is called the cone of depression.

The rate at which water is transmitted by an aquifer depends on the ability of the aquifer to transmit water and the hydraulic gradient. The amount of water released from storage depends chiefly on the elasticity and compressibility of the sands and the associated rocks and the expansion of the water as the artesian pressure is lowered.

Formulas have been developed to show the relationship among the yield of a well, the shape and extent of the cone of depression, and the properties of the aquifer (the specific yield, porosity, permeability or transmissibility, and storage). The coefficient of transmissibility of an aquifer is the rate of flow in gallons per day through a vertical strip of the aquifer 1 foot wide and extending the full saturated thickness of the aquifer under a hydraulic gradient of 100 percent. The coefficient of transmissibility determined from an aquifer test is reported for that part of the aquifer tapped by the well (the screened interval in Table 2). The wells tested in Harrison County did not penetrate the entire thickness of the water-bearing unit; thus they do not reflect the true transmissibility of the aquifer.

The coefficient of storage is the volume of water that an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in the component of head normal to that surface. When artesian conditions prevail, the coefficient of storage is a measure of the ability of the aquifer to yield water from storage by the compression of the aquifer and the expansion of the water as the artesian pressure is lowered. The coefficient of storage in an artesian aquifer is small compared to that in a water-table aquifer; consequently, when an artesian well starts discharging, a cone of depression is developed through a wide area in a short time. When water-table conditions prevail, the coefficient of storage is a measure of the ability of the aquifer to yield water from storage by gravity drainage of the aquifer; consequently, the cone of depression extends through a relatively small area. Under water-table conditions, the volume of water attributable to expansion is usually such a negligible part of the total volume of water released from the aquifer that the coefficient of storage is considered approximately the same as the specific yield.

The yield or discharge rate of a well usually is measured in gallons per minute (gpm), gallons per hour, or gallons per day (gpd). The yield depends on the ability of the aquifer to transmit water, the thickness of the water-bearing material, the construction of the well, the size and efficiency of the pump, and the allowable drawdown.

Formulas based on the hydraulic characteristics of an aquifer indicate that within limits the discharge from a well varies directly with the drawdown--that is, doubling the drawdown will double or nearly double the amount of discharge. The discharge per unit of drawdown (gpm per foot), or specific capacity, is of value in estimating the probable yield of a well.

Aquifer tests were made in five wells tapping the Cypress aquifer to determine the ability of the aquifer to transmit and store water. The results of the tests are given in Table 2. The data from the tests were analyzed using

Table 2.--Results of aquifer tests in Harrison County

Well	Screened interval (feet)	Average discharge during test (gpm)	Coefficient of trans-missibility (gpd/ft)	Specific capacity (gpm/ft)	Remarks
LK-35-22-706	272 - 316	20	1,900	1.1	Drawdown of pumped well.
LK-35-23-801	186 - 287	100	1,700	1.0	Recovery of pumped well; test by Layne-Texas Co.
LK-35-28-804	195 - 235	80 --	1,300 1,300	3.0 --	Drawdown of pumped well. Recovery of pumped well.
LK-35-37-803	191 - 207 226 - 241 367 - 394	170	4,200	1.8	Drawdown of pumped well.
LK-35-39-304	181 - 247	45 --	5,500 4,300	1.9 --	Drawdown of pumped well. Recovery of pumped well.

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the Theis nonequilibrium method as modified by Cooper and Jacob (1946, p. 526-534) and the Theis recovery method (Wenzel, 1942, p. 94-97). The coefficients of transmissibility ranged from 1,300 to 5,500 gpd per foot, discharge rates ranged from 20 to 170 gpm, and specific capacities ranged from 1.0 to 3.0 gpm per foot of drawdown. Where the full thickness of the aquifer is available, the coefficient of transmissibility probably is about 8,200 gpd per foot.

The coefficients of transmissibility and storage may be used to predict the future drawdown of water levels caused by pumping. Figure 6 shows the relation of drawdown to distance and time as a result of pumping from a water-table aquifer of infinite areal extent. Pumping is assumed to be at a constant rate of 300 gpm, the storage coefficient is 0.10, and the coefficient of transmissibility is 8,200 gpd per foot. The figure shows that the amount of drawdown increases with time. For example, at a point 1,000 feet from the pumped well the drawdown would be 1.5 feet after 30 days of pumping, 9.5 feet after 1 year, and about 19 feet after 10 years.

The storage coefficient of 0.10 used in the preparation of Figure 6 is a water-table-storage coefficient. This graph should be used in predicting the long-term effects of pumping from wells in the area or for predicting the effects of short-term pumping in shallow wells where water-table conditions clearly prevail. Although artesian conditions prevail in the deep wells, with long continuous pumping the aquifer is expected ultimately to perform as a water-table aquifer. Therefore, in the long-range predictions, the values shown on Figure 6 should be used. For predicting the effects of short-term pumping from deep wells, Figure 7 has been prepared showing the relation of drawdown to distance and time as a result of pumping from an artesian aquifer of infinite areal extent. This graph shows, for example, that at a point 1,000 feet from the pumped well the drawdown would be 26 feet after 30 days of pumping, 36 feet after 1 year of pumping, and 46 feet after 10 years of pumping.

Pumping from wells drilled close together may create cones of depression that intersect, thereby causing additional lowering of the piezometric surface or water table. The intersection of cones of depression, or interference between wells, will result in lower pumping levels (and increased pumping costs) and may cause serious declines in yields of the wells. If the pumping level is lowered below the top of the well screen, that part of the aquifer will become dewatered, and the yield of the well will decrease with the decrease in the thickness of the saturated part of the aquifer. The proper spacing of wells to minimize interference can be determined from the aquifer-test data.

Development of Ground Water

The use of ground water from the Cypress aquifer in Harrison County in 1964 was 2.4 mgd or 2,700 acre-feet (Table 3). Domestic use was about 40 percent of the total, industrial use about 36 percent, livestock use about 14 percent, public supply 10 percent, and irrigation about 1 percent.

Table 3.--Use of ground water from the Cypress aquifer in Harrison County, 1964

Use	Million gallons per day	Acre-feet per year
Public Supply	0.24	269
Industrial	.86	964
Domestic	.97	1,087
Livestock	.34	381
Total*	2.4	2,700

* Figures are approximate because some of the pumpage is estimated. Totals are rounded to two significant figures.

Water for domestic and livestock uses was obtained from approximately 4,000 wells, of which about 3,000 were less than 50 feet deep. Water for industrial use was obtained from 22 wells ranging in depth from 158 to 850 feet. The yields of these wells ranged from about 20 to 250 gpm. Practically all of the industrial water was pumped by the petroleum industries; about 0.52 mgd, or 60 percent, was for repressuring oil reservoirs, and about 0.34 mgd, or about 40 percent, served cooling and other industrial purposes.

Water for public supply was obtained principally from six wells in the following cities:

City	No. of wells	Screened intervals	Yield (gpm)	Average pumpage (mgd) in 1964
Hallsville	3	205 - 245	80 - 100	0.10
Karnack	1	287	100	.02
Waskom	2	150 - 151	25 - 133	.12

The water needs for Elysian Fields, Harleton, Scottsville, and Woodlawn are obtained largely from small capacity domestic wells which are privately or cooperatively owned; a small part of the population is supplied from wells owned by oil companies.

In 1964, only one well (LK-35-31-703) was used for irrigation. The well (yield about 200 gpm) pumped slightly more than 20 acre-feet of water. The quantity of water pumped for irrigation of lawns and small gardens has been included in the water used for domestic purposes (Table 3).

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Prior to 1949, relatively large amounts of ground water for municipal and industrial use were pumped by wells in and near Marshall. According to Broadhurst and Breeding (1943, p. 9), Marshall pumped about 1 mgd from 10 wells, six of which were about 3 miles northeast of the city. The depth of the wells ranged from 200 to 300 feet and the yields from 88 to 145 gpm. The rest of the wells were in the city limits. The depths of these wells ranged from 351 to 473 feet and the yields from 145 to 210 gpm.

Industry, principally the Darco Corp. (now the Atlas Chemical Industries, Inc.) reportedly pumped about 400,000 gpd from seven wells on the western edge of Marshall. The depth of the wells ranged from 50 to 248 feet, and the yields ranged from 22 to 133 gpm.

In 1949, Marshall abandoned its wells and since then has supplied its water needs as well as those of several industries from Caddo Lake. In 1964, Marshall used 4.1 mgd, or 4,600 acre-feet, almost twice the quantity of ground water pumped for all purposes in Harrison County in 1964.

Construction of Wells

About 75 percent of the estimated 4,000 water wells in Harrison County are less than 50 feet deep. These shallow wells tap the Cypress aquifer and supply most of the ground water for rural domestic and livestock needs. Generally, the older wells were dug and curbed with native ironstone or with brick; diameters ranged from 3 to 4 feet. Most of the newer wells are excavated by bucket-type power augers to depths ranging from 20 to 50 feet, and are curbed with 3-foot lengths of 30-inch-diameter cement tile. These shallow wells generally are equipped with water-jet, cylinder, or centrifugal pumps which are operated by electric motors of 1/4 to 1/2 horsepower. The lift seldom exceeds 30 feet, and generally the yields of the wells are sufficient for domestic and livestock needs.

Prior to the drought of the early 1950's, the deeper drilled and steel-cased wells for domestic and livestock use were rather uncommon in Harrison County. By 1964, however, almost 1,000 had been drilled by the hydraulic rotary method to depths ranging generally from 150 to 500 feet. A typical drilled domestic well is cased with a 4-inch-diameter steel pipe which is set at depths ranging from 200 to 300 feet. The annular space between the casing and wall is cemented, and then the well is drilled to the production interval. The method of completing the production interval varies, but both open-hole and screened production intervals are common. The trend in well construction is toward the use of screen and gravel pack in the production interval. The wells are equipped generally with water-jet, cylinder, or submersible pumps which are operated by electric motors of 1/2 to 1 horsepower. Lifts seldom exceed 100 feet. The pumps have capacities ranging from 5 to 10 gpm.

Well LK-35-28-803 (city of Hallsville) is typical of the construction of wells for municipal and industrial uses in Harrison County. The well site was selected from data provided by bit cuttings, drillers' logs, and electric logs of two test holes. The water-well test hole was drilled to 613 feet, although the drillers' log (Table 6) and the electric log indicated that the better water sands existed from about 162 to 200 feet. Briefly, the construction of the well is listed on the following page.

(1) The well was reamed to 160 feet and cased with 10-3/4-inch surface casing.

(2) The space between the surface casing and wall of the well was filled with cement under hydraulic pressure.

(3) The production interval was drilled to 205 feet and underreamed to a hole 26 inches in diameter that extended from the bottom of the casing to the bottom of the well.

(4) A total of 205 feet of 6-5/8-inch blank liner and screen was lowered to the bottom of the well; the screen (35 feet in length) was positioned opposite the water sands when the liner reached the bottom of the well.

(5) The space between the wall of the well and the blank liner and screen was filled with small-size gravel.

(6) The drilling mud was washed from the well and a preliminary production test was made on April 9, 1939. After pumping at 90 gpm, the drawdown was 35 feet--a specific capacity of 2.5 gpm per foot of drawdown.

Water Levels

Records of measurements of water levels in Harrison County are given in Table 5. Where water-table conditions prevail, the depths to water range from less than 5 to about 75 feet, but seldom exceed 30 feet except in hilly areas of relatively sharp relief. A comparison of the 1964 measurements with those of Broadhurst and Breeding (1943) indicates no general decline of water levels in the shallow wells (water-table conditions). The records do indicate seasonal fluctuations ranging from about 5 to 10 feet per year in response to rainfall. Well owners report, however, that in extended drought years such as the early 1950's, the water levels fluctuated over an even greater range.

Records of water-level fluctuations in wells tapping the deeper sands (artesian conditions) generally are too meager for comparative purposes. However, the available data indicate that in those wells that formerly supplied the water needs of Marshall, the water level declined approximately 15 feet per year until abandoned; whereas, in the wells supplying the needs of Hallsville, the water levels declined only about 2 feet per year.

Quality of Ground Water

The chemical constituents of ground water originate principally from the soil and rocks through which the water has moved. Generally, the chemical content of ground water increases with depth. The temperature of ground water near the land surface is about the same as the mean air temperature of the region and increases with depth. The laboratory analyses of water from 130 wells and 1 spring tapping the Cypress aquifer are given in Table 7. Field determinations of iron, pH, and hardness of 61 samples from the Cypress aquifer are given in Table 8. Temperatures of most of the water samples are given in Table 5.

The major factors that determine the suitability of a water supply are the limitations imposed by the contemplated use of the water. The various criteria of water-quality requirements which have thus been developed include bacterial content, physical characteristics (such as temperature, odor, color, and turbidity), and chemical constituents. Usually the bacterial content and the undesirable physical properties can be alleviated economically, but the removal of

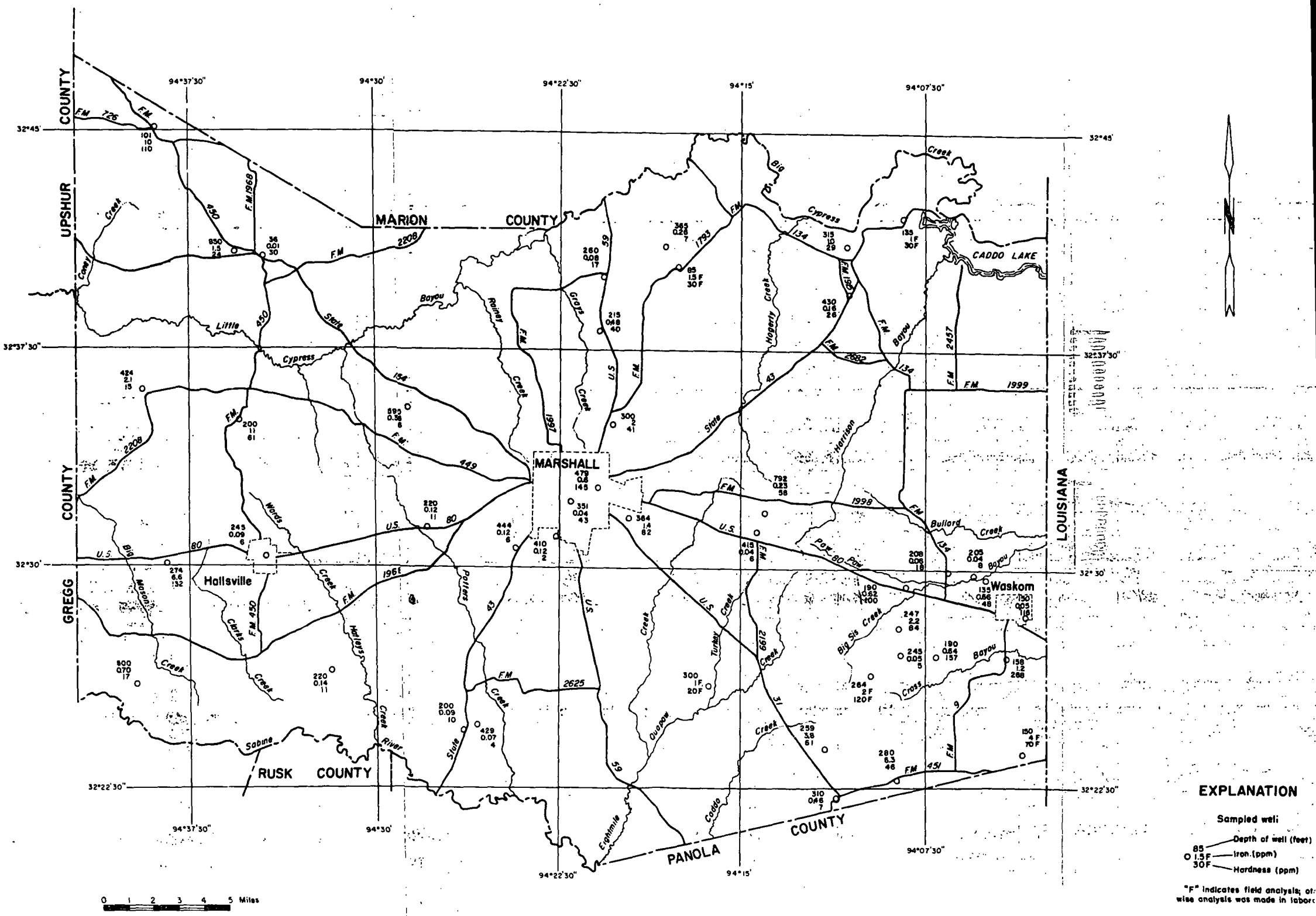

Figure 8

Depth of Wells and Iron Content and Hardness of Water

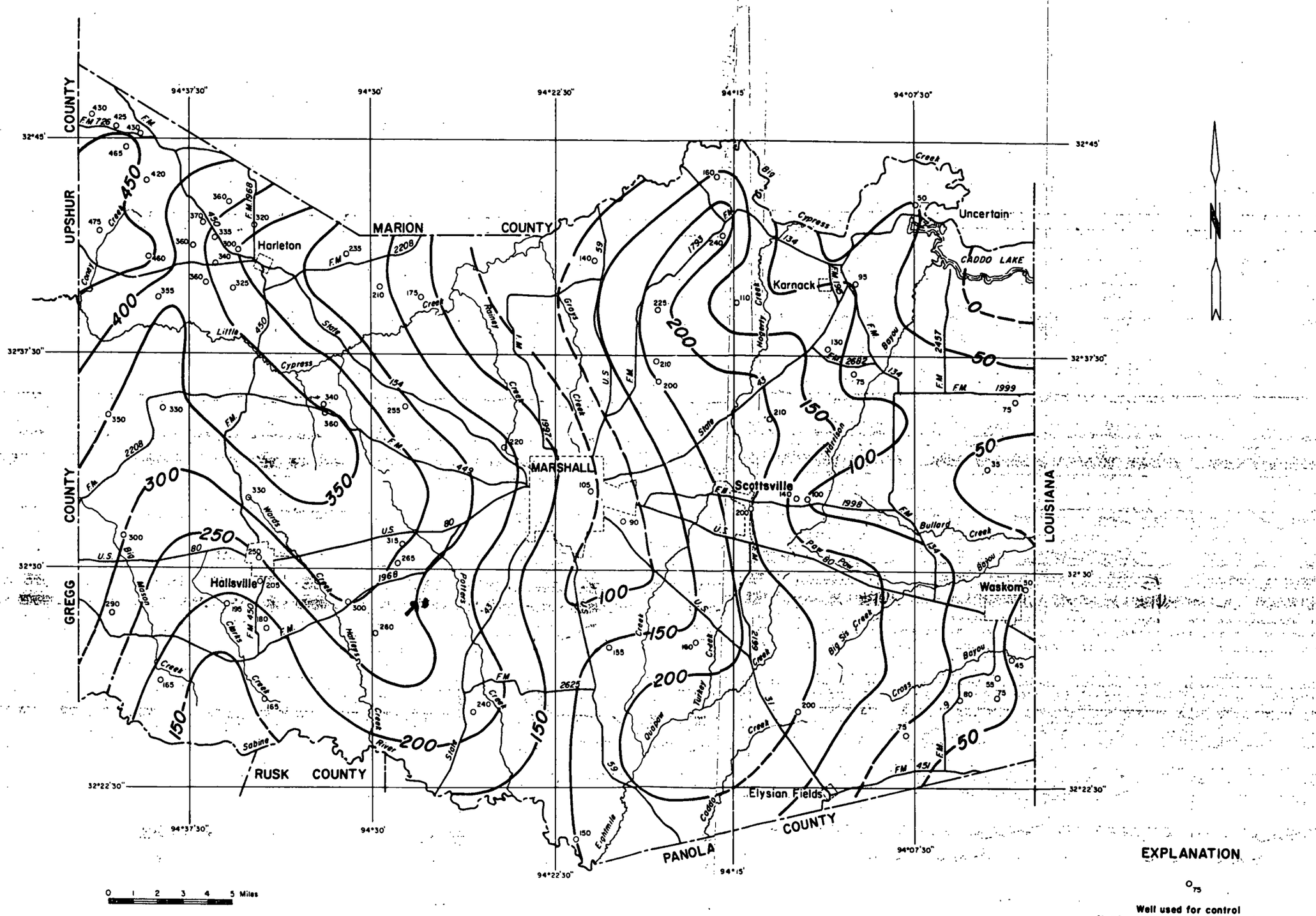

Figure 10

Approximate Thickness of Sand Containing Fresh to Slightly Saline

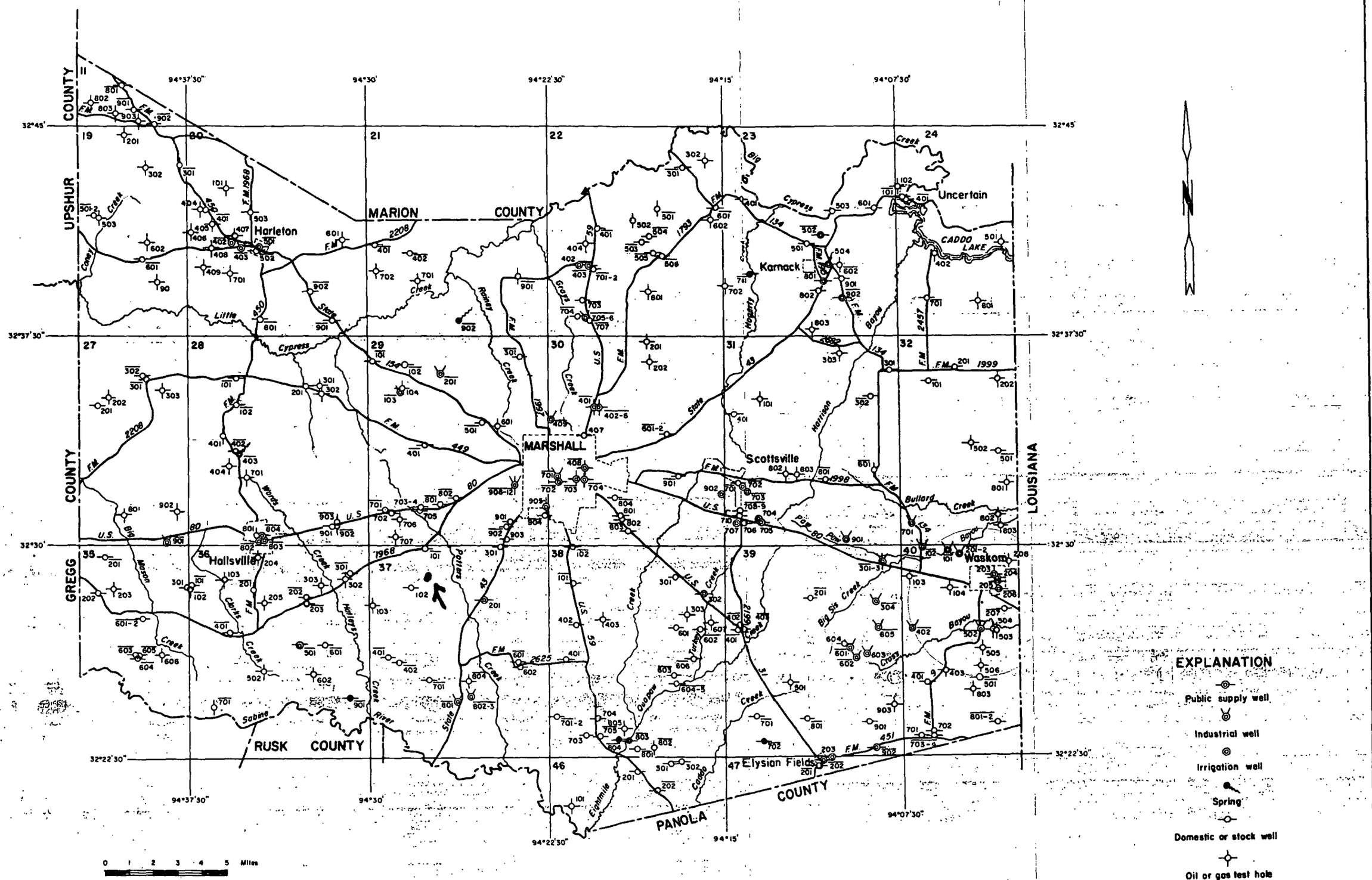

Figure 11

Locations of Wells, Springs, Test Holes, and Stream-Gaging Station

U.S. Geological Survey in cooperation with the Texas Water Development Board and the Harrison County Commissioners Court

Base compiled from topographic maps of the U.S. Geological Survey and county maps of the Texas State Highway Department

unknown but probably large quantity is lost by evapotranspiration. Thus, at least 55,000 acre-feet (49.1 mgd), and perhaps significantly more, is perennially available for development without depleting the aquifer.

A considerable part of the 40,000 acre-feet of rejected recharge possibly could be salvaged by the installation of shallow wells throughout the recharge area; however, because of the low transmissibility, the wells would necessarily be closely spaced in order to capture a significant part of the water before it is discharged into the streams. Although salvage of a large part of this rejected recharge probably would not be practical, the present rate of ground-water withdrawal (2,700 acre-feet per year or 2.4 mgd) could be increased several times.

In general, the total thickness of the sands in the Cypress aquifer (Figure 10) ranges from zero feet in the eastern part of the county to 475 feet in the northwestern part. Other factors being equal, the quantity of water available to a well increases as the saturated sands increase in thickness; thus, the quantity of water that can be pumped from a well should increase in a westerly direction. Also, the best area for potential development would be in the western and northwestern parts of the county.

Many small-capacity wells would be needed to develop fully the water resources of the Cypress aquifer in Harrison County because of the low coefficient of transmissibility. Consequently the cost of drilling and equipping these wells would principally determine the economic feasibility of developing ground water. Furthermore, the cost would be even greater if treatment of the water is required, particularly the maintaining of the dissolved-iron concentrations and pH values within acceptable limits.

Harrison County, being in a high-rainfall area, has little need for irrigation. Water for a limited amount of supplemental irrigation is available from the Cypress aquifer and could be used during periods of low rainfall. Continuous irrigation may be detrimental to the soil because of the relatively high SAR and RSC values.

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Table 5.--Records of wells and springs in Harrison County

All wells are drilled unless otherwise noted in remarks column.
Water level : Reported water levels given in feet; measured water levels given in feet and tenths.
Method of lift and type of power : A, airlift; B, bucket; C, cylinder; Cf, centrifugal; E, electric; G, gasoline, butane, or Diesel engine; H, hand; J, jet; N, none; T, turbine. Number indicates horsepower.
Use of water : D, domestic; Ind, industrial; Irr, irrigation; N, none; P, public supply; S, stock.

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*LK-35-11-801	(b) (6) [redacted]	--	1956	25	30	345	20.3	July 1, 1964	B,H	D	Dug well, curbed with cement tile.
802	(b) (6) [redacted] well 1	-- Grelling, et al.	1951	7,940	--	329	--	--	--	--	Oil test. 1/
803	(b) (6) [redacted] well 1	Sunray D-X Oil Co.	1962	3,902	--	315	--	--	--	--	Do.
† 901	(b) (6) [redacted]	--	1910	16	42	315	8.6 10.2 13.3	Jan. 29, 1942 Sept.28, 1960 July 1, 1964	B,H	D	Dug well, curbed with brick. Reported never goes dry. Temp. 56°F.
† 902	(b) (6) [redacted]	-- Ford	1957	101	4	300	49.1	July 1, 1964	J,E, 2	D,S	
903	-- McIntosh unit 1	-- Tipton, et al.	1963	3,955	--	349	--	--	--	--	Oil test. 1/
19-201	-- Treadwell well 1	do	1963	3,900	--	372	--	--	--	--	Do.
† 301	(b) (6) [redacted] Estate	--	--	39	36	360	27.1	Jan. 29, 1942	C,H	N	Dug well, curbed with cement tile. Old well.
302	(b) (6) [redacted]	-- Tipton, et al.	1963	3,900	--	372	--	--	--	--	Oil test. 1/
† 501	(b) (6) [redacted]	--	--	35	36	320	25.4 28.1	Jan. 29, 1942 Sept.29, 1960	J,E	D	Dug well, curbed with brick. Old well.
502	do	--	1963	310	4	320	69.5	July 1, 1964	N	D	
503	(b) (6) [redacted] well 1	H. O. Gossett, Jr.	1960	3,769	--	315	--	--	--	--	Oil test. 1/
† 601	Morton Baptist Church	--	--	32	48	340	27.0 27.1 28.5	Jan. 29, 1942 Sept.29, 1960 July 2, 1964	J,E, 1/4	D	Dug well, curbed with concrete. Supplies water for church and rectory.
602	(b) (6) [redacted] well 1	Texas Eastern Transmission Corp., et al.	1960	3,820	--	330	--	--	--	--	Oil test. 1/
901	(b) (6) [redacted] well 1	Sinclair Oil & Gas Co.	1957	7,665	--	--	--	--	--	--	Do.
20-101	(b) (6) [redacted] well 1	Placid Oil Co.	1947	8,000	--	320	--	--	--	--	Do.

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*LK-35-20-401 †	--	--	--	18	48	375	5.7 10.8 13.1	Jan. 29, 1942 Sept.28, 1960 July 2, 1964	B,H	D	Dug well, open hole. Temp. 67°F.
† 402	Hunt Oil Co.	Hunt Oil Co.	--	850	8	340	96.4	Oct. 21, 1964	A	Ind	Temp. 71°F.
† 403	Whelan Oil Co.	-- Cox	1957	583	6	315	--	--	T,E, 5	Ind	Casing perforated near bottom. Gravel-packed to surface. Reported discharge 25 gpm.
404	(b) (6) well 2	Placid Oil Co.	1946	8,000	--	390	--	--	--	--	Oil test. 1/
405	[redacted] well 1	do	1946	7,950	--	380	--	--	--	--	Do.
406	(b) (6) well 1	do	1948	6,931	--	350	--	--	--	--	Do.
407	(b) (6) well 1	Whelan Oil Co.	1947	8,002	--	310	--	--	--	--	Do.
408	(b) (6) well 1	do	1947	7,925	--	320	--	--	--	--	Do.
409	(b) (6) well 1	Placid Oil Co.	1946	8,300	--	318	--	--	--	--	Do.
† 501	Harleton Independent School	--	1964	36	30	325	20.8	July 2, 1964	J,E, 1/2	P	Bored well, curbed with cement tile.
† 502	(b) (6) [redacted]	--	1956	310	4	310	90.6	do	T,E, 1/2	D	
† 503	-- (b) (6) well 1	Whelan Oil Co.	1948	7,940	--	345	--	--	--	--	Oil test. 1/
601	(b) (6) well 1	Edson Petroleum Co.	1939	866	--	270	--	--	--	--	Do.
701	(b) (6) [redacted] well 1	Whelan Oil Co.	1948	7,892	--	264	--	--	--	--	Do.
* † 801	(b) (6) [redacted]	--	1941	61	30	320	58.0 54.3	Jan. 29, 1942 Sept.29, 1960	J,E, 1/2	D,S	Dug well, curbed with clay tile. Temp. 65°F.
* † 901	(b) (6) [redacted]	--	1910	34	36	230	14.0 19.3 24.3	Jan. 29, 1942 Oct. 3, 1960 July 6, 1964	C,E	D,S	Dug well, curbed with brick. Reported water gets low in dry weather, but never fails.
* 902	Athey Baptist Church	--	1961	150	4	355	74.5	July 6, 1964	J,E, 1	P	
* 21-401	Friendly School	--	1950	60	30	320	34.2 35.5	Sept.29, 1960 July 6, 1964	J,E, 1/3	P	Dug well, curbed with cement tile. Supplies water for school.
* 402	Friendly Church	--	1950	30	30	320	20.6	Sept.29, 1960	J,E, 1/3	P	Dug well, curbed with cement tile.

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison Co

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
LK-35-21-701	East Harleton Gas Unit 2, well 1	Humble Oil & Refining Co.	1960	7,410	--	205	--	--	--	--	Oil test. 1/
702	(b) (6) well 1	Edson Petroleum Co.	1939	828	--	220	--	--	--	--	Do.
† 901	Hickory Grove Church	--	--	16	36	280	3.6 11.5 12.2	Jan. 30, 1942 Oct. 3, 1960 July 2, 1964	B,H	N	Dug well, open hole. Old well.
*† 902	St. James Church	--	--	Spring	--	290	+	July 30, 1964	Flows	P	Estimated flow ½ gpm. Temp. 66°F.
* 22-301	(b) (6)	--	1964	39	30	220	15.8	July 16, 1964	J,E, 1/2	D,S	Bored well, curbed with cement tile. Supplies water for house and about 100 head of cattle.
302	-- Veatch well 1	Humble Oil & Refining Co.	1952	6,488	--	204	--	--	--	--	Oil test. 1/
* 401	(b) (6)	--	1956	21	30	250	16.8 18.7	Oct. 3, 1960 Aug. 7, 1964	C,E, 1/3	D	Dug well, curbed with cement tile.
402	Woodlawn School	Wm. Brummett	--	300	4	325	--	--	C,E, 1	P	Cased to 169 ft, open hole to bottom. Supplies water for school.
† 403	Woodlawn Community Center	do	--	260	4	315	--	--	C,E	P	Cased to 172 ft, open hole to bottom.
404	(b) (6) well 1	Trice Production Co.	1955	6,632	--	287	--	--	--	--	Oil test. 1/
† 501	--	--	1930	30	36	280	21.7	Oct. 4, 1960	C,H	N	Open hole. School gone, pump broke.
502	(b) (6)	--	1958	100?	4	292	41.3 26.6	do July 16, 1964	J,E, 1/2	N	Casing perforated near bottom. Reported yields water with iron taste. House burned down; pump disconnected.
* 503	(b) (6)	-- Brummett	1952	200	4	315	30	1959	J,E, 1/2	D,S	Casing perforated from 160 ft to bottom. Gravel-packed to surface.
† 504	(b) (6)	Wheelis Drilling Co.	1951	365	4	265	50	1951	J,E, 2	D,S	Cased to bottom, open end. Supplies water for dairy.
† 505	(b) (6)	--	1939	45	30	305	40.4 43.4	Feb. 11, 1942 Oct. 4, 1960	B,H	S	Dug well, open hole. Reported dry July 16, 1964.
* 506	(b) (6)	-- Bell	1958	85	2	310	68	1958	J,E, 1/3	D,S	Cased to bottom, open end.
† 601	Beckham Church	--	1938	17	30	270	2.1 8.8 10.2	Feb. 11, 1942 Oct. 4, 1960 July 17, 1964	C,E	D	Reported well deepened in 1955 or 1956 and curbed with cement tile.
602	(b) (6) well 1	Humble Oil & Refining Co.	1952	6,810	--	304	--	--	--	--	Oil test. 1/

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
LK-35-22-701	(b) (6) [redacted]	Wayne Hightower	1958	189	3	300	30	1959	J,E	N	Casing perforated near bottom. Reported water has iron taste.
702	do	--	--	24	42	300	12.8	Oct. 3, 1960	J,E	D	Dug well. Old well.
* 703	Geo. Ives	Wm. Brummett	1954	220	4	320	80.4 89.8	Apr. 2, 1958 Aug. 7, 1964	J,E, 1	S	Casing and cement to 120 ft, open hole to bottom.
† 704	San Jacinto Gas Processing Co.	do	1954	215	4	310	85	1960	T,E, 3/4	D	Casing and cement to 156 feet. Pump set at 119 ft.
† 705	Mississippi River Fuel Corp. well 1	do	1960	215	8, 4	305	59.3 60.8	June 22, 1964 Oct. 7, 1964	T,E, 1	Ind	Casing 8-in. to 35 ft, 4-in. liner and cement to 105 ft, screen and gravel-walled to bottom. Used as standby well. Temp. 70°F.
† 706	Mississippi River Fuel Corp. well 2	do	1960	316	4	305	60.6 74.6	Dec. 2, 1960 Oct. 7, 1964	T,E, 1	Ind	Casing and cement to 272 ft. Screen and gravel-walled to bottom. Reported discharge 15 gpm. Temp. 71°F.
† 707	Mississippi River Fuel Corp.	do	1955	200	4	285	30.8	June 22, 1964	J,E, 3/4	D	Casing and cement to 105 ft, open hole to bottom. Supplies water for domestic use and warehouse.
801	Geo. Slaughter well 1	Stanolind & Continental Co.	1947	10,374	--	283	--	--	--	--	Oil test. 1/
23-401	(b) (6) [redacted]	-- Bell	1958	181	2	208	20.3	Oct. 6, 1960	C,E, 1/4	D	Screen 8 ft at bottom.
* 501	(b) (6) [redacted]	Wm. Brummett	1960	214	4	295	--	--	J,E, 2	D	Casing and cement to 158 ft.
† 502	Caddo Lake State Park	Civilian Conservation Corps	1935	315	7	310	163.3 163.5 162.9	Oct. 27, 1941 Oct. 4, 1960 June 17, 1964	T,E, 1	P	Casing perforated from about 255 ft to bottom.
503	(b) (6) [redacted]	--	1952	180	6	175	6.5	Oct. 4, 1960	T,E, 2	D	Supplies water for 3 houses.
* 504	Karnack School	--	1955	265	6	265	65	1955	J,E, 2	P	Casing and cement to 160 ft, open hole to bottom. Standby well. School uses municipal water.
* 601	(b) (6) [redacted]	Wm. Brummett	1960	135	4	192	19.6	Oct. 4, 1960	J,E, 3/4	D	Casing and cement to 71 ft, open hole to bottom.
† 602	Longhorn Ordnance Works	B. F. Eddington	1942	133	5	233	22.5 26.9 27.9 28.5	May 5, 1958 June 4, 1958 Oct. 6, 1960 June 17, 1964	N	N	Screened from 85 ft to bottom. Reported discharge 20 gpm with drawdown of 42 ft when drilled. Used as standby well. Plant uses water from Cypress Bayou for potable and industrial needs. 2/

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-23-701	(b) (6) [redacted] Estate	A. G. Foster	1931	--	12	185	+ +	Oct. 28, 1941 Oct. 6, 1960	Flows	S	Oil test; converted to water well. Measured flow 1½ gpm. Temp. 68°F.
702	(b) (6) [redacted] Estate well 1	Humble Oil & Refining Co.	1951	6,890	--	202	--	--	--	--	Oil test. 1/
† 801	Karnack Water Supply Corp.	B. F. Eddington	1942	430	12, 6	275	70.6 83.5	Mar. 10, 1942 Feb. 26, 1963	T,E, 15	P	Well reworked by Layne-Texas Co. in 1963. Reported discharge 100 gpm with drawdown of 96.5 ft. Pump set at 200 ft. 2/
802	(b) (6) [redacted]	Wm. Brummett	1956	265	4	285	64.0 65.6	Mar. 31, 1958 July 17, 1964	J,E, 1/2	D	Cased to 135 ft, open hole to bottom. Used as standby well.
803	(b) (6) [redacted] Estate well B-1	Humble Oil & Refining Co.	1953	6,765	--	301	--	--	--	--	Oil test. 1/
* 901	(b) (6) [redacted]	Wm. Brummett	1960	240	4	240	--	--	J,E, 3/4	D	Casing and cement to 156 ft, open hole to bottom.
† 902	Geo. Washington Carver School	B. F. Eddington	1940	105	6	240	--	--	C,E, 3/4	P	Standby well. School uses municipal water.
† 24-101	(b) (6) [redacted]	do	1940	103	6	185	18	June 1940	C,E, 3/4	D	Cased to 98 ft, open from 98 ft to bottom. Supplies water for 7 houses and one cafe.
102	(b) (6) [redacted] ell 1	-- Barnwell, et al.	1938	--	--	180	--	--	--	--	Oil test. 1/
† 401	(b) (6) [redacted]	A. G. Foster	1940	103	4	182	--	--	J,E, 1/2	D	Cased to 90 ft, open hole from 90 ft to bottom.
402	-- (b) (6) [redacted]	-- Moore	--	301	4	190	13.5 17.5	Nov. 3, 1941 July 20, 1964	N	N	Reported supply insufficient for domestic use. Unused. Obstruction in well at about 20 ft.
501	Texas State unit no. 13	R. A. Whittington, et al.	1963	2,382	--	186	--	--	--	--	Oil test. 1/
† 701	Elizabeth Church	--	1936	36	36	215	6.1 7.3 11.6	Feb. 12, 1942 Nov. 6, 1960 July 20, 1964	B,H	D	Dug well, curbed with brick.
801	La-Tex Oil Co. well A-1	Stanolind Oil & Gas Co.	1956	--	--	266	--	--	--	--	Oil test. 1/
27-201	(b) (6) [redacted]	--	1871	28	36	390	22.9	Sept.29, 1960	C,E, 1/4	D,S	Dug well, open hole completion.
202	-- (b) (6) [redacted] ell 1	Sells Petroleum Co.	1952	7,000	--	343	--	--	--	--	Oil test. 1/
† 301	Hebron School	--	1930	16	24	310	12.0 14.0	Jan. 29, 1942 Sept.29, 1960	B,H	P	Dug well, curbed with cement tile since 1942. Dry July 21, 1964. Temp. 59°F.

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-27-302	(b) (6) [redacted]	--	1963	424	4	325	--	--	T,E, 2	S	
303	(b) (6) [redacted] well 1	Atlantic Refining Co.	1949	8,000	--	255	--	--	--	--	Oil test. 1/
801	(b) (6) [redacted] well 1	Fairway Operating Co.	1962	7,607	--	352	--	--	--	--	Do.
† 901	Grove Valve Regulator Co.	--	1960	274	6	360	86.8	July 24, 1964	T,E, 1	Ind	Reported water used only for utilities; not used for drinking purposes. Temp. 70°F.
† 28-101	Cartersville Church	--	1941	25	30	290	2.9 18.1 22.3	Jan. 30, 1942 Sept.29, 1960 July 21, 1964	B,H	D	Reported well deepened from 20 to 25 ft in about 1956, and curbed with cement tile. Supplies water for church. Reported several families in area haul water from well.
† 102	(b) (6) [redacted]	--	1964	200	3	325	--	--	J,E, 1-1/2	S	Supplies water for chicken farm.
201	(b) (6) [redacted]	--	1930	30	30	260	23.8	Sept.29, 1960	C,E, 1/3	D,S	Dug well, curbed with cement tile.
301	(b) (6) [redacted] et al. well 1	Bill Tipton	1958	7,305	--	280	--	--	--	--	Oil test. 1/
302	(b) (6) [redacted] well 1	Jackson Oil Co.	1958	7,305	--	324	--	--	--	--	Do.
401	(b) (6) [redacted]	W. Hightower	1957	280	6	350	80.1	Apr. 3, 1958	N	N	Reported well never used.
† 402	[redacted]	--	1936	30	30	365	16.4 20.9 22.6	Jan. 28, 1942 Sept.29, 1960 July 21, 1964	J,E, 1/3	D,S	Dug well. Reported goes dry in summer.
403	Noonday Camp Ground	--	--	Spring	--	305	+	July 21, 1964	Flows	D	Estimated flow 1 gpm. Chemical analysis for old abandoned spring about 100 yards upstream. Temp. 65°F.
701	(b) (6) [redacted] well 1	P. N. Wiggins, Jr.	1954	7,500	--	377	--	--	--	--	Oil test. 1/
801	City of Hallsville	Layne-Texas Co.	1938	932	--	415	--	--	N	N	Supply reported insufficient for city use. Dry and abandoned. Water test. 1/
† 802	do	do	1954	242	10, 6	360	101 102.4	1954 July 4, 1958	T,E, 15	P	Reported discharge 100 gpm. Screen from 195 to 233 ft. Temp. 70°F.
† 803	do	do	1939	201	10, 6	350	64	1939	T,E, 10	P	Reported discharge 85 gpm. Screen from 160 to 201 ft. Drilled to 613 ft, plugged back to 201 ft. Temp. 69°F. 2/
† 804	do	do	1963	245	13, 6	360	115.2	Oct. 9, 1964	T,E, 10	P	Measured discharge 80 gpm. Screen from 195 to 235 ft. Drilled to 280 ft, plugged back to 245 ft. Temp. 69°F.

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
LK-35-28-901	(b) (6) [redacted]	D. Delahunt	1960	44	30	375	22.5	Oct. 26, 1960	J,E, 1/4	D,S	Bored well, curbed with cement tile.
† 902	(b) (6) [redacted]	B. F. Eddington	1941	250	7	375	102.4	do	N	N	Abandoned.
† 903	(b) (6) [redacted]	do	1941	272	7	370	96.3	do	N	N	Do.
* 29-101	New Zion Church	--	1960	34	30	310	24.7 28.2	Oct. 3, 1960 July 29, 1964	B,H	D	Bored well, curbed with cement tile. Temp. 65°F.
† 102	(b) (6) [redacted]	Wm. Brummett	--	240	4	285	25.4 25.3 37.0	Apr. 2, 1958 Dec. 30, 1960 July 29, 1964	C,E	D,S	Casing and cement to 188 ft. Open hole to bottom.
† 103	Hunt Oil Co.	Mustang Drilling Co.	1963	590	8, 4	285	24	1963	T,E	Ind	Reported discharge 240 gpm with 106 ft of drawdown after 4 hours pumping. Used for water-flooding. Screen from 498 to 568 ft.
104	(b) (6) [redacted] well 2	Hunt Oil Co.	1959	6,935	--	272	--	--	--	--	Oil test. 1/
† 201	Hunt Oil Co.	Mustang Drilling Co.	1963	600	8, 4	350	86	1963	T,E	Ind	Reported discharge 180 gpm with 34 ft of drawdown after 8 hours pumping. Screen from 470 to 540 ft. Pump set at 200 ft. Used for water-flooding.
† 301	Macadonia Church	--	--	37	36	370	8.0 11.0 13.6	Jan. 30, 1942 Oct. 3, 1960 July 30, 1964	B,H	D	Dug well, open hole.
† 401	Potters Creek Church	--	1932	23	36	460	14.8 17.4	Feb. 17, 1942 Sept.29, 1960	B,H	D	Dug well, curbed with brick.
† 501	Ebenezer Church	--	1910	30	36	380	11.2	Oct. 3, 1960	B,H	D	Do.
602	(b) (6) [redacted] well 1	S. Pinkston, Jr.	1960	4,879	--	365	--	--	--	--	Oil test. 1/
† 701	(b) (6) [redacted]	--	--	25	48	410	15.6 24.3	Jan. 28, 1942 Oct. 26, 1960	B,H	D	Dug well, curbed with brick.
702	[redacted]	Henry Alford	1932	103	36	400	26.7 29.2	Oct. 26, 1960 July 30, 1964	N	N	Dug well, open hole.
† 703	[redacted]	W. Brummett	1955	220	4	345	67.0	July 30, 1964	J,E, 1	D	Cased to 150 ft.
* 704	[redacted]	do	1950	222	4	342	--	--	J,E, 1	D	Cased to 150 ft; gravel to bottom.
705	[redacted]	do	1956	198	4	335	--	--	J,E, 3/4	D	Cased to 150 ft; open hole to bottom.

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
LK-35-29-706	(b) (6) [redacted] well 1	Humble Oil & Refining Co.	1956	7,390	--	373	--	--	--	--	Oil test. 1/
707	(b) (6) [redacted] well 1	do	1957	7,448	--	398	--	--	--	--	Do.
* 801	(b) (6) [redacted]	W. Brummett	1954	250	6	350	48.5 48.9	Apr. 2, 1958 July 30, 1964	T,E	D,S	Cased to 125 ft, open hole to bottom.
† 802	[redacted]	--	1934	30	60	330	10.7 24.0	Jan. 28, 1942 Oct. 26, 1960	J,E, 1/3	D	Dug well, curbed with brick.
901	[redacted]	W. Brummett	1956	205	4	415	66.5	Oct. 27, 1960	T,E, 1/2	S	Cased to 105 ft, open hole to bottom.
† 902	[redacted]	Barnwell Drilling Co.	--	444	4	420	139.5	Oct. 23, 1964	T,E	D	
† 903	Grange Hall School	W. Brummett	1950	315	4	412	126.8	Oct. 29, 1960	T,E, 1/2	P	Pump set at 165 ft. Supplies water for school.
† 904	(b) (6) [redacted]	Barnwell Drilling Co.	1963	410	4	395	106.5	Oct. 23, 1960	T,E	D	Casing: 4-in. to 328 ft. 2-in. liner and screen from 328 ft to bottom.
905	[redacted]	W. Hightower	1956	443	6	400	49.4	Apr. 2, 1958	T,E, 1	N	Cased to 197 ft, perforated from 157 ft to 197 ft. Open hole to bottom. Reported discharge 20 gpm, but water has iron taste and not used.
*† 906	Atlas Chemical Industries, Inc.	--	1926	248	6	358	--	--	N	N	Abandoned.
*† 907	do	--	1927	192	6	358	--	--	N	N	Do.
*† 908	do	--	1927	201	6	354	--	--	N	N	Do.
*† 909	do	Walter A. Miller	1934	111	16, 9	356	--	--	N	N	Do.
*† 910	do	--	1940	50	48	358	--	--	N	N	Dug well. Abandoned.
*† 911	do	B. F. Eddington	1941	128	10	362	25	1941	N	N	Abandoned.
*† 912	do	do	1941	125	10	366	25	1941	N	N	Abandoned. 2/
30-201	(b) (6) [redacted] well 1	Stanolind Oil & Gas Co.	1944	6,870	--	220	--	--	--	--	Oil test. 1/
202	(b) (6) [redacted] well 1	Humble Oil & Refining Co.	1951	6,696	--	311	--	--	--	--	Do.
† 401	City of Marshall	Ed Mills	1906	610	10	305	14.0	Nov. 17, 1941	N	N	Abandoned. Measured discharge 88 gpm in 1941. 2/

See footnotes at end of table.

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Table 5.--Records of wells and springs in Harrison County--Continued

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-30-402	City of Marshall	Ed Mills	1925	300	10	310	19.7	Nov. 12, 1941	N	N	Abandoned. Measured discharge 145 gpm in 1941. Temp. 64°F.
† 403	do	Fred Fielder & Ed Mills	1928	300	8	315	--	--	N	N	Abandoned. Measured discharge 120 gpm in 1941.
404	do	Fred Fielder	1927	300	8	315	--	--	N	N	Abandoned. Measured discharge 145 gpm in 1941.
† 405	do	Ed Mills	1932	300	10	310	22.3	Nov. 12, 1941	N	N	Abandoned. Measured discharge 132 gpm in 1941. Temp. 64°F.
† 406	do	do	1936	240	8	305	--	--	N	N	Abandoned. Measured discharge 145 gpm in 1941. Temp. 65°F.
* 407	(b) (6) [redacted]	--	--	300	--	330	39.6	June 10, 1964	J,E, 3/4	D	
† 408	City of Marshall	Layne-Texas Co.	1938	479	16, 8	325	--	--	N	N	Abandoned. Screened intervals 278-320, and 336-339 ft. Measured discharge 158 gpm in 1941. Pump set at 360 ft. Temp. 71°F.
* 409	Snider Lumber Co.	Bamwell Drilling Co.	--	220	4	370	70.4	Oct. 13, 1964	T,E, 1/2	Ind	Screened interval, 160-200 ft. Water treated for iron before used.
* 601	Marshall Country Club	W. Hightower	1949	470	6	350	89.0	Apr. 1, 1958	--	--	Abandoned.
602	do	do	1960	285	4	350	--	--	T,E, 1/2	D	
† 701	Independent Ice Co.	J. C. Boling	1936	323	12, 8	362	66.0 64.3 66.7	Oct. 5, 1960 Feb. 7, 1963 Sept. 1, 1964	A,E, 20	Ind	Used as standby well.
† 702	City of Marshall	J. B. White	1936	351	18, 12	361	100 181.8	1936 Nov. 12, 1941	T,E, 30	P	Used as standby well. Screened from 264 ft to bottom. Measured discharge 145 gpm in 1941. Temp. 69°F.
† 703	do	Layne-Texas Co.	1937	375	16, 8	332	100 180.9	1937 Nov. 12, 1941	N	N	Abandoned. Screened from 254 ft to bottom. Measured discharge 198 gpm in 1941. Pump set at 340 ft. Temp. 69°F.
† 704	do	do	1937	473	16, 8	332	114	1937	--	--	Abandoned. Screened from 301 ft to bottom. Measured discharge 210 gpm in 1941. Pump set at 340 ft.
* 801	(b) (6) [redacted]	Joe Gillespie	1960	335	6	382	86.5 98.4	Dec. 2, 1960 Aug. 7, 1964	T,E, 2	D	Pump set at 180 ft.
802	[redacted]	W. Hightower	1958	308	2	380	--	--	J,E, 3/4	D	Supplies water for minnow tanks at store. Pump set at 120 ft.

See footnotes at end of table.

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Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-30-803	(b) (6) [redacted]	--	--	24	37	--	12.5 6.1	Feb. 17, 1942 Nov. 30, 1960	C,H	D	Dug well, curbed with clay tile. Old well.
† 804	[redacted]	Sam Bamwell	1963	364	4, 2	390	--	--	T,E, 1	D	Screen from 328 ft to bottom. Pump set at 150 ft.
† 901	[redacted]	--	1925	31	36	370	15.8 19.0	Feb. 9, 1942 Oct. 5, 1960	C,H	D	Dug well, curbed with brick.
902	Verhalen Nursery	-- Cobb	1955	403	4	378	--	--	A,E	Irr	Used as standby well.
31-101	(b) (6) [redacted] well 1	Hollandsworth, et al.	1960	6,730	--	320	--	--	--	--	Oil test. 1/
301	Antioch Church	--	--	16	36	230	12.7	Oct. 6, 1960	C,E, 1/3	D	Dug well, curbed with brick.
† 302	(b) (6) [redacted]	-- Benson	1933	205	10, 6	300	--	--	T,E, 2	D,S	Pump set at 60 ft. Reported discharge 7 gpm.
303	H. High well 1	Humble Oil & Refining Co.	1952	6,503	--	236	--	--	--	--	Oil test. 1/
401	(b) (6) [redacted]	W. Brummett	1959	284	4	--	--	--	J,E, 1	D,S	Pump set at 84 ft.
† 601	Hart School	--	--	17	42	320	7.0 9.8	Feb. 12, 1942 Oct. 6, 1960	N	N	Dug well, curbed with brick. Old well. School gone, well unused.
† 701	Verhalen Nursery	--	1935	28	120	385	--	--	J,E, 3/4	D	Dug well, curbed with brick. Supplies water for 2 houses and packing shed.
† 702	do	-- Cobb	1955	411	4	380	84.7	July 10, 1964	A,G	Irr	Standby well. Reported discharge 100 gpm.
† 703	do	-- Lace	1955	792	9	385	92.2 91.0	July 10, 1964 Nov. 12, 1964	T,E, 25	Irr	Oil test, converted to water well, and plugged back to 792 ft. Perforated from 250 to 410 ft. Measured discharge 127 gpm with 36.7 ft of drawdown after 2½ hours pumping. Pump set at 220 ft. Temp. 72°F.
704	do	-- Cobb	1955	409	4	385	--	--	A,G	Irr	Standby well. Reported discharge 70 gpm.
705	Kelly School	W. Brummett	1955	190	4	383	--	--	J,E, 1	P	Supplies water for school.
706	(b) (6) [redacted]	W. Hightower	--	400	4	370	--	--	T,E, 1	D	
707	[redacted]	--	1955	400	10	365	69.5 65.5	Nov. 10, 1960 Nov. 13, 1964	T,E, 20	Irr	Used as standby well.
† 708	Verhalen Nursery	--	1930	27	108	370	4.4 14.5	Feb. 9, 1942 Oct. 5, 1960	C,E, 1	D	Dug well, curbed with brick.

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-31-709	Verhalen Nursery	--	--	415	4	370	76.4	June 22, 1964	T,E, 1	D	Pump set at 150 ft.
710	(b) (6) [redacted]	W. Brummett	1952	220	4	345	--	--	C,E, 1/2	D	Reported to discharge water with iron taste.
† 801	Shilo Baptist Church	--	--	19	30	290	8.8 8.1	Feb. 12, 1942 Oct. 6, 1960	B,H	D	Dug well, curbed with brick. Old well.
802	(b) (6) [redacted] et al. well 1	Humble Oil & Refining Co.	1953	6,159	--	286	--	--	--	--	Oil test. 1/
803	(b) (6) [redacted] et al. well 1	do	1952	6,609	--	270	--	--	--	--	Do.
901	Le Cuno Oil Co.	W. Brummett	1957	220	7	310	--	--	T,E, 2	Ind	Reported used for water flooding.
32-101	Pleasant Hill Church	--	1945	21	36	290	18.1 18.7	Oct. 6, 1960 July 20, 1964	B,H	D	Dug well, curbed with brick. Supplies water for church.
201	(b) (6) [redacted]	W. A. Trice	1957	156	5	242	22.6 26.2	Mar. 31, 1958 May 5, 1960	J,E	D,S	Cased to 86 ft. Open hole to bottom.
202	-- (b) (6) [redacted]	Placid Oil Co.	1949	8,323	--	277	--	--	--	--	Oil test. 1/
† 501	Mt. Zion School	--	1939	18	30	242	5.9 5.2 10.3	Feb. 12, 1942 Oct. 6, 1960 July 20, 1964	B,H	D	Dug well, curbed with brick.
502	(b) (6) [redacted] Estate well 1	Gulf Oil Corp.	1956	--	--	275	--	--	--	--	Oil test. 1/
701	Le Cuno Oil Co.	--	1950	190	7	290	--	--	T,E, 1-1/2	Ind	Reported water used for cooling gas lines.
801	(b) (6) [redacted] well 3	A. L. Dawsey	1963	4,905	--	236	--	--	--	--	Oil test. 1/
802	(b) (6) [redacted]	Le Cuno Oil Co.	1954	2,362	--	220	--	--	--	--	Do.
803	(b) (6) [redacted] well B-2	--	1956	2,359	--	205	--	--	--	--	Do.
† 35-201	(b) (6) [redacted]	J. C. Boling	1937	304	10, 5	410	--	--	C,E, 1	D,S	Casing perforated from 116 ft to bottom.
202	(b) (6) [redacted]	--	1955	20	30	340	1.3	Oct. 25, 1960	C,E, 1	D	Dug well, curbed with cement tile.
203	[redacted] well 1	The Texas Co.	1952	8,000	--	365	--	--	--	--	Oil test. 1/

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
LK-35-35-301	(b) (6) [redacted]	C. G. Southerland	--	445	4	365	13.0	Oct. 25, 1960	J,E, 2	D	
† 601	[redacted]	--	1957	450	5	310	59.1	July 24, 1964	J,E, 2	S	
* 602	do	--	1934	31	30	310	20.5	do	J,E, 3/4	D	Dug well, curbed with brick.
* 603	Le Tourneau Ranch	--	1958	40	24	300	23.6	Oct. 25, 1960	J,E, 1/2	D	Bored well, curbed with cement tile.
† 604	do	-- Cobb	1954	500	6	290	--	--	T,E, 15	S	Reported well originally drilled for irrigation, but pumped too much sand, and is now used for stock.
* 605	do	--	--	150	6	295	39.6 41.4	Oct. 25, 1960 July 24, 1964	J,E	D	
606	(b) (6) [redacted] well 1	E. R. Jackson, et al.	1955	7,450	--	275	--	--	--	--	Oil test. 1/
* † 36-101	(b) (6) [redacted]	--	--	35	48	370	19.6 25.3	Oct. 26, 1960 July 28, 1964	J,E, 1	S	Dug well, curbed with cement tile. Supplies water for 25,000 chickens.
102	Maple Springs School	C. I. Southerland	1936	16	24	360	5.4 9.5 10.7	Jan. 27, 1942 Oct. 25, 1960 July 28, 1964	N	N	Dug well, curbed with clay tile.
103	(b) (6) [redacted] well 1	Fohs Oil Co.	1940	4,547	--	300	--	--	--	--	Oil test. 1/
† 201	(b) (6) [redacted]	Henry Alford	1940	32	36	380	23.9 27.9	Jan. 27, 1942 Oct. 26, 1960	N	N	Dug well, curbed with brick. Abandoned.
† 202	[redacted]	--	1910	26	21	340	11.5 15.0	Jan. 27, 1942 Oct. 25, 1960	C,E, 1/6	D,S	Dug well, curbed with brick. Reported discharge 400 gpm.
* 203	[redacted]	W. Brummett	1956	200	4	340	--	--	C,E, 3/4	D,S	
204	(b) (6) [redacted] well 1	Paul Scott, et al.	1942	3,015	--	360	--	--	--	--	Oil test. 1/
205	(b) (6) [redacted] well 1	Lyons McCord, et al.	1955	7,410	--	268	--	--	--	--	Do.
† 301	Sweet Home Church	--	1936	20	36	345	5.3 11.1 16.7	Jan. 28, 1942 Oct. 28, 1960 July 28, 1964	B,H	D	Dug well, curbed with brick.
302	--	Bay Oil Corp.	1941	3,000	--	325	--	--	--	--	Oil test. 1/
303	(b) (6) [redacted] well 1	Hollandsworth Oil Co.	1955	7,209	--	295	--	--	--	--	Do.

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-36-401	(b) (6) [redacted]	--	1927	27	40	325	16.4 20.8	Nov. 4, 1941 Oct. 26, 1960	J,E, 1/6	D	Dug well. Open hole to bottom.
† 501	Copperville School	Bob Newhouse	1925	28	40	340	19.1 24.3 27.1	Jan. 27, 1942 Oct. 26, 1960 July 28, 1964	J,E, 1/2	P	Do.
502	-- (b) (6) [redacted]	Atlantic Refining Co.	1955	6,946	--	241	--	--	--	--	Oil test. 1/
† 601	(b) (6) [redacted]	W. Brummett	1956	220	4	320	--	--	C,E	D	Sand from 205 ft to bottom.
602	(b) (6) [redacted] well 1	Hollandsworth Oil Co.	1952	7,135	--	265	--	--	--	--	Oil test. 1/
† 701	(b) (6) [redacted] Ranch	J. E. Wesson	1937	18	--	245	--	--	C,H	N	Driven well. Well not used in 1964.
* † 901	(b) (6) [redacted]	E. O. Butler	1935	200	10	235	+	June 12, 1964	Flows	S	Oil test; converted to water well at about 200 ft. Estimated flow 15 gpm. Temp. 68°F.
* † 37-101	(b) (6) [redacted]	W. Hightower	1960	465	4	370	95.8	Oct. 26, 1960	T,E, 1	D,S	Supplies water for 3 houses and dairy barn.
102	Red Oak School	--	1939	26	48	371	17.1 20.4	Jan. 28, 1942 Oct. 26, 1960	C,E	D	Dug well; open hole to bottom. Reported dry July 31, 1964.
103	-- (b) (6) [redacted] well 1	H. Strief	1944	2,806	--	340	--	--	--	--	Oil test. 1/
201	Canaan School	--	--	300?	4	345	64.7	Aug. 3, 1964	T,E, 1	P	Supplies water for school.
301	(b) (6) [redacted]	--	--	30	30	--	20.7	Oct. 27, 1960	B,H	D	Dug well.
† 401	Atlas School	--	--	22	48	300	14.1 17.6	Jan. 28, 1942 Nov. 10, 1960	B,H	D	Dug well; open hole to bottom. Reported dry July 31, 1964.
† 402	(b) (6) [redacted]	--	1964	370	4	360	103.4	Aug. 3, 1964	T,E, 1	D,S	Perforated from 310 ft to bottom.
* † 601	--	--	--	6	--	330	--	--	--	D,S	One of three dug wells located at a spring site known as Roseborough Springs. Reported water is red, and contains a comparatively high mineral content. Temp. 68°F.
602	(b) (6) [redacted]	B. F. Eddington	--	214	4	335	--	--	C,E	D,S	
† 701	[redacted]	--	--	25	24	305	4.6 8.1	Nov. 10, 1960 July 31, 1964	B,H	D	Dug well, curbed with brick. Old well.
† 801	Atlas Chemical Industries	W. Hightower	1958	200	4	285	31.0	Nov. 10, 1960	T,E	Ind	

See footnotes at end of table.

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Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-37-802	Natural Gas Pipeline Co. of America	Layne-Texas Co.	1951	429	10	310	56	Sept. 1960	T,E, 40	Ind	Supplies water for 18 houses and camp station. Screen from 212-243, 361-376, and 381-397 ft.
† 803	do	do	1951	420	10	315	41.0	Oct. 8, 1964	T,E, 40	Ind	Screen from 191-207, 225-241, and 362-393 ft. Temp. 71°F.
804	-- (b) (6) [redacted] well 1	C. H. Murphy, Jr.	1947	7,257	--	375	--	--	--	--	Oil test. 1/
† 38-101	(b) (6) [redacted]	--	1910	43	36	330	4.9 12.1	Feb. 17, 1942 Nov. 10, 1960	B,H	D,S	Dug well, curbed with concrete.
* 102	[redacted]	W. Brummett	1960	285	4	330	--	--	T,E, 1/2	D	Cased to 235 ft, open hole to bottom.
301	[redacted]	--	1960	274	4, 1	330	47.5	Nov. 30, 1960	J,E, 3/4	D,S	
302	Rosenwald School	--	1946	30	36	340	--	--	J,E, 1/4	P	Dug well.
303	(b) (6) [redacted] Estate well 1	W. I. Sage	1964	3,560	--	338	--	--	--	--	Oil test. 1/
401	(b) (6) [redacted]	-- Bell	1956	327	2	--	--	--	J,E, 1-1/2	D,S	
402	(b) (6) [redacted]	D. Benson	1964	250	4	340	26.2	July 6, 1964	T,E, 1/2	D	
403	(b) (6) [redacted] well 1	Stanolind Oil & Gas Co.	1945	6,800	--	310	--	--	--	--	Oil test. 1/
601	(b) (6) [redacted]	W. C. Barnwell	1959	325	4	340	--	--	T,E, 3	D	
*† 602	Humble Pipeline Co.	-- Applebaum	1931	150	5	290	15.7	Mar. 31, 1958	J,E, 1	D	
† 603	(b) (6) [redacted]	--	1912?	--	6	260	+	Aug. 6, 1964	Flows	S	Temp. 68°F.
* 604	do	Waterman Lumber Co.	1910	275	6	260	+	do	Flows	S	Estimated flow 1 gpm. Temp. 70°F.
* 605	do	do	1910	275?	6	260	+	do	Flows	S	Estimated flow 10 gpm. Temp. 68°F.
* 606	do	La Gloria Oil Co.	1952	300	10	266	+	do	Flows	S	Oil test drilled to 6,810 ft, converted to water well, and completed at 300 ft. Estimated flow 1 gpm. Temp. 69°F.
607	(b) (6) [redacted] well 1	Le Cuno Oil Co.	1960	4,375	--	326	--	--	--	--	Oil test. 1/

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-38-701	(b) (6) [redacted]	V. E. West	1937	105	3	320	--	--	C,H	N	Unused well. Screen from 96 ft to bottom.
702	do	--	--	41	36	320	27.5	Nov. 10, 1960	B,H	D	Dug well, curbed with brick. Old well.
703	(b) (6) [redacted]	--	--	25	36	290	9.1	Oct. 11, 1960	J,E	D,S	Dug well.
704	[redacted]	J. H. Brummett	1952	267	4	270	--	--	T,E	D,S	
* 705	[redacted]	W. M. Brummett	1956	217	4	250	14.2	Nov. 10, 1960,	J,E, 3/4	D,S	
* † 801	[redacted]	--	1924	73	8	280	27.3 37.4	Nov. 10, 1960 Aug. 6, 1964	B,H	D,S	Cased with clay tile. Temp. 66°F.
† 802	do	--	1918	91	4	290	24.3	Aug. 6, 1964	N	N	
*† 803	do	The Texas Co.	1919	--	12	230	+	do	Flows	S	Oil test; converted to water well.
* † 804	(b) (6) [redacted]	Sabine Drilling Co.	1925	--	12	230	+	do	Flows	S	Oil test; converted to water well. Estimated flow ½ gpm. Temp. 68°F.
805	(b) (6) [redacted] well 1	La Gloria Oil Corp.	1952	6,802	--	224	--	--	--	--	Oil test. 1/
† 39-201	Long Ridge School	--	--	33	30	365	4.9 11.1	Feb. 13, 1942 Nov. 30, 1960	B,H	D	Dug well, curbed with brick.
† 301	Waskom Natural Gas Corp.	--	1953	190	8	285	89	1960	J,E	D	Plant shut down, well converted to domestic use. Reported discharge 120 gpm.
302	do	--	1951	190	6	285	61.0	July 13, 1964	T,E, 3	N	Reported discharge 30 gpm.
303	do	W. C. Barnwell	1959	190	8	285	--	--	T,E, 15	N	Reported discharge 120 gpm.
† 304	La Gloria Oil Co.	--	1962	247	7	320	82.8	Sept.29, 1964	T,E, 3	Ind	Casing perforated from 181 ft to bottom. Measured discharge 44½ gpm. Reported used for water flooding. Temp. 68°F.
† 401	(b) (6) [redacted]	--	1840	35	30	310	4.4 11.2	Feb. 17, 1942 Nov. 30, 1960	J,E, 1	D	Dug well.
* 402	[redacted]	--	1958	190	4	313	18.7	Aug. 11, 1964	J,E, 1/3	D	
* 403	[redacted]	W. Hightower	1958	192	2	310	--	--	J,E, 1	D	
501	[redacted] well 1	Fred Whitaker	1955	6,442	--	380	--	--	--	--	Oil test. 1/

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*LK-35-39-601	P. G. Lake Oil Co.	--	1963	264	7	395	96	May 1963	T,E, 7-1/2	Ind	Casing perforated from 224 ft to bottom. Reported discharge 60 gpm. Gravel-packed from bottom to surface. Pump set at 241 ft. Temp. 69°F.
* 602	do	--	1963	295	7	390	152.5	Nov. 13, 1964	T,E, 7-1/2	Ind	Casing perforated from 225 ft to bottom. Gravel-packed from bottom to surface. Pump set at 246 ft. Reported used for water flooding. Temp. 69°F.
603	do	--	1963	299	7	385	118.9	do	N	Ind	Used as standby well. Casing perforated from 222 ft to bottom. Gravel-packed from bottom to surface.
604	(b) (6)	Robert Frazier	1946	20	30	385	9.4	Nov. 30, 1960	B,H	D	Dug well, curbed with cement tile.
† 605	La Gloria Oil Co.	--	1962	245	7	355	105.8	Sept.29, 1964	T,E, 5	Ind	Reported discharge 80 gpm. Screen from 183 ft to bottom. Temp. 70°F.
* 701	-- (b) (6)	W. Hightower	1964	180	2	340	--	--	J,E, 3/4	D	Screen from 172 ft to bottom.
* 702	(b) (6)	--	--	--	4	294	+	July 17, 1964	Flows	S	Temp. 67°F.
† 801		W. Brummett	1956	259	6	365	--	--	J,E	D	Sand from 164 ft to bottom. Water treated for iron before used.
901		--	--	17	36	370	1.7 2.8	Feb. 13, 1942 Nov. 30, 1960	B,H	D,S	Dug well, curbed with brick.
† 902	Elysian Fields High School	W. Hightower	1961	280	4	365	--	--	T,E, 2	P	Pump set at 80 ft. Water treated for iron before used.
903	-- (b) (6) ell 1	Arkansas-Louisiana Gas Co.	1945	6,501	--	380	--	--	--	--	Oil test. 1/
† 40-101	Arkansas-Louisiana Chemical Corp.	Montgomery Drilling Co.	1957	205	8	225	40	1960	T,E, 30	Ind	Screen from 165 ft to bottom. Reported discharge 200 gpm. Pump set at 180 ft. Temp. 70°F.
† 102	(b) (6)	Eddington Drilling Co.	--	208	6	257	--	--	J,E, 3	Ind,D	Supplies water for cotton gin, store, and 5 houses. Pump set at 80 ft.
103		Arkansas-Louisiana Gas Co.	1940	--	--	300	--	--	--	--	Oil test. 1/
104		do	1940	--	--	280	--	--	--	--	Do.
† 201	Arkansas-Louisiana Chemical Corp.	Clifford & Davis	1950	135	13, 8	135	66.5	May 31, 1957	T,E, 15	Ind	Screen from 95 ft to bottom. Reported discharge 74 gpm. Pump set at 110 ft.

See footnotes at end of table.

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
†LK-35-40-202	Arkansas-Louisiana Chemical Corp.	Clifford & Davis	1948	125	13, 8	236	79.2	May 31, 1957	T,E, 30	Ind	Standby well. Reported discharge 100 gpm. Screen from 75 ft to bottom. Pump set at 115 ft.
203	City of Waskom	R. L. Clifford	1953	150	10, 7	295	119.5	Mar. 22, 1960	N	N	Abandoned.
† 204	do	W. M. Waterman	1924	151	6	285	--	--	T,E, 7-1/2	P	Pump set at 120 ft. Temp. 69°F.
205	do	--	1948	150	8	285	122.2	June 18, 1964	N	N	Abandoned.
† 206	do	M. O. Tucker	1959	150	14, 8	282	--	--	T,E, 25	P	Reported discharge 133 gpm. Screen from 110 ft to bottom. Temp. 68°F.
† 207	United Gas Pipeline Co.	Magnolia Petroleum Co.	1927	170	6	260	--	--	T,E, 1	D	Supplies water for 3 houses.
208	(b) (6) [redacted] well 1	Arkansas-Louisiana Gas Co.	1940	3,220	--	290	--	--	--	--	Oil test. 1/
† 401	(b) (6) [redacted]	--	--	40?	30	348	9.2 2.9	Feb. 13, 1942 Nov. 30, 1960	B,H	D,S	Dug well, curbed with brick.
† 402	La Gloria Oil Co.	--	1962	190	7	330	78.4	Oct. 6, 1964	T,E, 3	Ind	Screen from 115 ft to bottom. Reported discharge 30 gpm. Used for water flooding. Temp. 69°F.
403	(b) (6) [redacted]	Bert Fields Oil Co.	1947	6,225	--	330	--	--	--	--	Oil test. 1/
* † 501	Gainesville Church	--	1925	22	24	290	14.6 13.3 21.7	Feb. 13, 1942 Nov. 29, 1960 Aug. 11, 1964	B,H	D	Dug well, curbed with brick. Temp. 66°F.
† 502	Bert Fields Oil Co.	W. Hightower	1957	158	4	282	--	--	J,E, 1/2	Ind	
503	do	do	--	150	6	237	9.3	Oct. 20, 1964	N	N	Used as standby well.
504	(b) (6) [redacted] well 1	Bert Fields Oil Co.	--	6,126	--	225	--	--	--	--	Oil test. 1/
505	-- (b) (6) [redacted] well 1	--	1945	6,299	--	250	--	--	--	--	Do.
506	-- [redacted] well 2	Bert Fields Oil Co.	1946	6,210	--	300	--	--	--	--	Do.
701	New Hebron Baptist Church	W. Hightower	1956	240	4	362	13.9	Nov. 29, 1960	J,E, 1/4	D	Reported water treated for iron before used. Sand from 210 ft to bottom.
702	(b) (6) [redacted]	Z. V. Hightower	1942	32	32	345	16.1	do	C,E, 1/4	D,S	Dug well.

See footnotes at end of table.

A4

Table 5.--Records of wells and springs in Harrison County--Continued

Well	Owner	Driller	Date completed	Depth of well (ft)	Diameter of well (in.)	Altitude of land surface (ft)	Water level: Below land-surface datum (ft)	Water level: Date of measurement	Method of lift	Use of water	Remarks
*LK-35-40-703	(b) (6) [redacted]	--	1940	112	4	348	--	--	J,E, 1/2	D	Casing perforated from 40 ft to bottom.
* † 704	do	--	--	25	36	348	3.0 3.5 9.5	Feb. 13, 1942 Nov. 29, 1960 Aug. 11, 1964	B,H	S	Dug well, curbed with brick. Old well.
* 801	(b) (6) [redacted]	W. Hightower	1960	150	2	320	--	--	J,E, 1/2	D	Pump set at 60 ft.
* 802	do	--	1940	18?	30	330	8.7 14.2	Nov. 29, 1960 Aug. 11, 1964	B,H	D	Dug well, curbed with brick.
803	(b) (6) [redacted]	Bert Fields, et al.	1946	--	--	319	--	--	--	--	Oil test. 1/
46-101	- (b) (6) [redacted] well 1	Union Production Co.	1949	6,730	--	210	--	--	--	--	Do.
201	(b) (6) [redacted]	W. Brummett	1954	192	4	284	--	--	J,E, 3/4	D	Reported water treated for iron before used.
* † 202	Sabine Bishop Co-op.	A. E. Fawcett	1940	147	4	290	42.5 42.0	Nov. 10, 1960 Aug. 5, 1964	J,E, 1	D	2/
301	(b) (6) [redacted]	W. Brummett	1958	250	4	335	--	--	C,E, 1	D	
302	do	Seismograph Crew	--	120	4	325	--	--	C,E, 1	S	
† 47-201	(b) (6) [redacted]	W. Hightower	1957	310	2	340	--	--	J,E, 1	D	
* 202	Elysian Fields Community Center	do	1954	228	4	339	15.9 18.1	Nov. 29, 1960 July 22, 1964	J,E, 1	P	
203	Booker T. Washington School	do	1954	220	4	342	--	--	J,E, 1	P	Reported iron in water.

* For field determinations of analyses of water from wells and springs in Harrison County see Table 8.
† For chemical analyses of water from wells and springs in Harrison County see Table 7.
1/ Electric logs in files of Texas Water Development Board.
2/ For drillers' logs of wells in Harrison County see Table 6.

AS

Table 6.--Drillers' logs of wells in Harrison County

Well LK-35-23-602

Owner: Longhorn Ordnance Works. Driller: B. F. Eddington.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	15	15	Shale, sandy, water-bearing	31	106
Sand, fine brown, gravel and iron ore	30	45	Rock	2	108
Shale, blue	30	75	Sand	25	133

Well LK-35-23-801

Owner: Karnack Water Supply Corp. Driller: B. F. Eddington.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Surface soil	22	22	Lignite	5	165
Shale, blue	33	55	Shale	38	203
Sand	11	66	Shale with streaks of sand	87	290
Shale	34	100	Rock	1	291
Shale, sandy	37	137	Gumbo and shale	139	430
Rock	1	138			
Shale, sandy	22	160			

Well LK-35-28-803

Owner: City of Hallsville. Driller: Layne-Texas Co.

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Clay, white, sandy	3	3	Shale, blue	44	244
Clay, yellow	10	13	Rock	1	245
Shale, black, sticky	106	119	Shale, sandy	7	252
Rock	1	120	Sand, black	17	269
Shale and boulders	22	142	Shale, sandy	6	275
Shale, sandy	20	162	Sand	10	285
Sand, white	38	200	Shale, sandy	33	318

(Continued on next page)

Table 6.--Drillers' logs of wells in Harrison County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well LK-35-28-803--Continued					
Shale, brittle----------	68	386	Shale----------	10	602
Shale, black----------	69	455	Rock----------	1	603
Shale, sandy----------	46	501	Shale and lignite-------	10	613
Sand, gray, fine-grained----------	91	592			

Well LK-35-29-912

Owner: Atlas Chemical Industries, Inc. Driller: B. F. Eddington.

Clay, red----------	6	6	Sand, white, water------	12	115
Sand, red, water---------	59	65	Lignite----------	2	117
Sand, green, water-------	38	103	Sand and lignite--------	8	125

Well LK-35-30-401

Owner: City of Marshall. Driller: Ed Mills.

Surface soil----------	1	1	Sandstone----------	1	101
Sand and clay----------	11	12	Clay, gray----------	11	112
Rock, red and yellow-----	14	26	Sand, gray----------	4	116
Lignite----------	1	27	Lignite----------	1	117
Sand, gray----------	17	44	Clay, gray----------	4	121
Clay, gray----------	23	67	Sandstone----------	3	124
Clay, soft dark-brown----	8	75	Clay, gray----------	6	130
Lignite----------	5	80	Lignite----------	1	131
Clay----------	4	84	Sand, gray----------	8	139
Lignite----------	8	92	Rock, hard----------	21	160
Clay, white----------	8	100	Sand and clay----------	12	172

(Continued on next page)

Table 6.--Drillers' logs of wells in Harrison County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well LK-35-30-401--Continued					
Lignite	3	175	Lignite	2	332
Sand and gray clay	15	190	Sand and clay	1	333
Lignite	3	193	Rock, shelly	3	336
Sand, white	17	210	Sand, sharp	31	367
Lignite	1	211	Sandrock, soft gray	51	418
Sand, gray	26	237	Sandrock, hard	1	419
No record	1	238	Rock, soft gray	86	505
Sandstone	1	239	Rock, hard	3	508
Clay, gray	3	242	Sandrock	2	510
Sand, coarse-grained	7	249	Sand and clay	10	520
Lignite	4	253	Rock, hard	6	526
Sand, white, water	4	257	Clay, pipe	22	548
Lignite	1	258	Rock, hard	1	549
Sand, gray	17	275	Sand, gray	28	577
Lignite	5	280	Clay, pipe	6	583
Clay, gray and sand	10	290	Lignite	1	584
Sand, gray	20	310	Sandrock, gray	11	595
Clay and lignite	10	320	Lignite, clay and sand	15	610
Clay, gray	10	330			

Table 6.--Drillers' logs of wells in Harrison County--Continued

	Thickness (feet)	Depth (feet)		Thickness (feet)	Depth (feet)
Well LK-35-30-408					
Owner: City of Marshall. Driller: Layne-Texas Co.					
Clay, red	26	26	Lignite	5	245
Sand, gray, coarse-grained loose	38	64	Sand, fine-grained, silty	17	262
Sand and shale, gray, fine-grained	87	151	Shale, soft, and fine-grained dark-gray sand	67	329
Rock	1	152	Sand and shale, fine-grained dark-gray	37	366
Sand	5	157	Sand	6	372
Lignite	3	160	Rock, hard	1	373
Shale, soft, blue, and sand, fine-grained	42	202	Sand, dark-gray	30	403
Rock	5	207	Rock	2	405
Shale, brown, hard, with layers of sand	33	240	Shale, brown, sticky	74	479
Well LK-35-46-202					
Owner: Sabine-Bishop Co-Op. Driller: A. E. Fawcett.					
Topsoil and clay	10	10	Shale, dark-colored	53	93
Shale, blue	10	20	Sand and sandy shale, tested for water, no good	22	115
Lignite and rock	2	22	Shale, dark-colored	14	129
Shale, dark-colored	5	27	Sand, good, water	18	147
Sand	13	40			

Table 8.--Results of field determinations of water from wells and springs in Harrison County

(Analyses given are in parts per million except pH.)

Well	Depth of well (ft)	Iron (Fe)	Hardness as $CaCO_3$	pH	Well	Depth of well (ft)	Iron (Fe)	Hardness as $CaCO_3$	pH
LK-35-11-801	25	0	30	5.5	LK-35-35-602	31	0	20	5.0
20-401	18	0	--	6.0	603	40	0	120	6.0
801	61	0	--	5.0	605	150	1.0	50	7.0
901	34	0	--	5.0	36-101	35	0	30	4.5
902	150	0	20	5.5	203	200	0	30	7.5
21-401	60	0	50	6.5	901	200	.5	--	7.5
402	30	0	100	6.5	37-101	465	0	20	7.5
902	Spring	0	--	6.0	601	6	--	--	4.5
22-301	39	0	30	5.5	38-102	285	0	20	7.5
401	21	0	50	6.0	602	150	0	--	7.5
503	200	1	20	6.0	604	275	0	30	7.5
506	85	1.5	30	6.0	605	275	0	20	7.5
703	220	0	20	7.5	606	300	1	20	7.0
23-501	214	0	50	7.5	705	217	0	30	7.5
504	265	0	20	7.5	801	73	0	--	6.5
601	135	1	30	7.0	803	--	0	--	8.0
901	240	0	20	7.5	804	--	0	--	8.0
29-101	34	0	50	5.5	39-402	190	0	20	7.5
704	222	0	20	7.5	403	192	0	20	7.5
801	250	1	350	7.0	601	264	2	120	7.0
906	248	35	--	6.3	602	295	5	70	7.0
907	192	55	--	6.1	701	180	1	--	7.0
908	201	50	--	6.2	702	--	5	120	6.5
909	111	55	--	4.3	40-501	22	0	--	6.0
910	50	2.5	--	6.2	703	112	2	--	6.5
911	128	15	--	6.6	704	25	0	--	5.5
912	125	15	--	6.9	801	150	4	70	6.5
30-407	300	0	20	7.5	802	18?	0	20	5.5
409	220	10+	--	5.5	46-202	147	0	--	7.5
601	470	.5	130	7.0	47-202	228	10+	--	6.5
801	335	1.0	120	7.0					

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REFERENCE 13

TEXAS WATER COMMISSION

Paul Hopkins, Chairman
John O. Houchins, Commissioner
B. J. Wynne, III, Commissioner

James K. Rourke, Jr., General Counsel
Michael E. Field, Chief Examiner
Karen A. Phillips, Chief Clerk

Allen Beinke, Executive Director

January 20, 1988

Texas Water Commission
RECEIVED
JAN 22 1988
Field Operations
District 5

Mr. Jay A. Pruett
Manager of Environmental Affairs
Southwestern Electric Power Company
P. O. Box 21106
Shreveport, LA 71156

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Re: H. W. Pirkey Power Plant
SWR 33240
Closure Groundwater Monitoring Proposal

Dear Mr. Pruett:

We have completed a technical review of the "Preliminary Groundwater Assessment of the Metal Cleaning Pond and Recommendations for Additional Work," a proposal submitted in November, 1987 by Espey, Huston and Associates, Inc. Our comments concerning the proposal are noted as follows:

1. Additional Monitor Wells - The proposal contains a recommendation that two additional monitor wells be installed as depicted in Figure 4-1 on Page 9. We request that an additional monitor well be installed to the East of MW-11 with the location being within a lateral spacing interval of 150 feet to 200 feet from MW-11. The approximate location is shown on a copy of Figure 4 - 1, which is attached to this letter. All additional monitor wells should be located as close to the downgradient extent of the Metal Cleaning Pond as is possible since the objective is to determine whether a release has occurred from the facility. Additional data which should be provided is included in Attachment I to this letter. Additionally, when this additional information is submitted, we also request as-built information on monitor wells MW-12 and MW-11 as this is not contained in our records.

2. Groundwater Quality Monitoring - We request that in addition to the proposed parameters listed on Page 11 of the proposal that additional determinations be included for the hazardous

metals contained in the interim status water quality standards: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and Silver.

The specific monitoring period is not specified in the proposal. We request that monitoring be carried out quarterly beginning after completion of the additional monitor wells. At the end of that period, the data collected from each well will be used to complete a statistical comparison of the groundwater quality upgradient and downgradient from the Metal Cleaning Pond.

3. Data Evaluation and Response - A statistical comparison of groundwater quality data collected quarterly over a 2 year period from the upgradient monitor well (MW-12) and each downgradient monitor well shall be used to determine whether a release from the Metal Cleaning Pond has occurred. We suggest that the statistical procedure referenced in 40 CFR 264.97 (Cochran's Approximation to the Behrans - Fisher Student's t-test at the .05 level of confidence) or another mutually agreed upon procedure be utilized to make this statistical comparison.

   If a statistical increase is determined to have occurred, a response on the part of Southwestern Electric Company (SWEPCO) will be required to determine what the appropriate post-closure response should be. However, if the monitoring data indicates that no groundwater release from the Metal Cleaning Pond has occurred, then SWEPCO can certify that "clean closure" has been achieved.

Please advise us in writing within 30 days from your receipt of this letter of your schedule for installing the additional monitor wells and carrying out the monitoring activities. Any questions that you have concerning this matter should be referred to Mr. Robert W. Lee, P.E. at 512/463-8425.

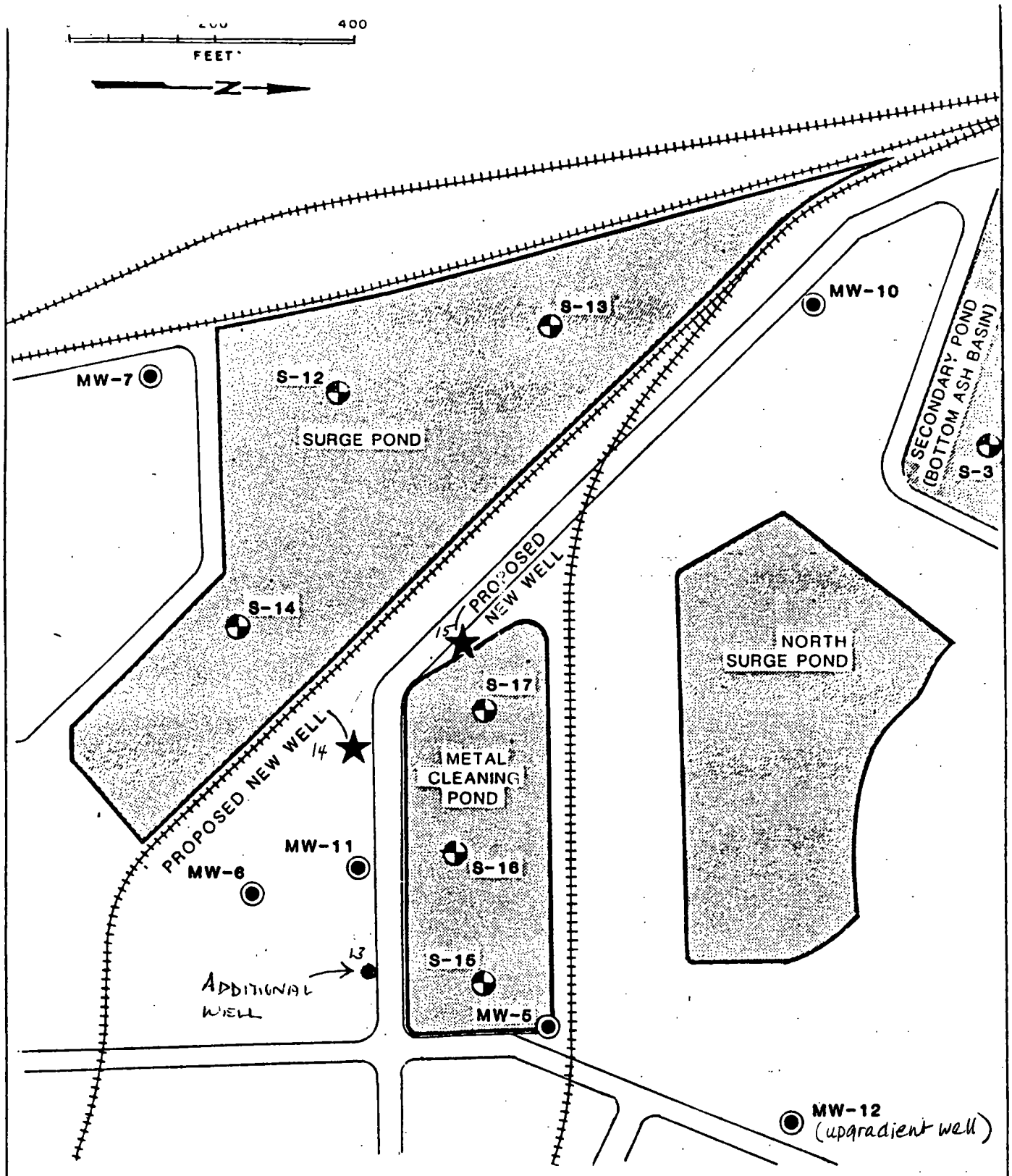
Sincerely,

Robert W. Lee for

Samuel B. Pole, Chief
Hazardous and Solid Waste Enforcement Section
Hazardous and Solid Waste Division

RWL/da

cc: Rick Bowles, TWC District 5 Office
Linda Smith, TWC Solid Waste Enforcement Section
Russell Kimble, TWC Reports and Management



EXISTING MONITOR WELL
SAMPLE BORING
PROPOSED MONITOR WELL

ESPEY, HUSTON & ASSOCIATES, INC.
Engineering & Environmental Consultants

FIGURE 4-1

LOCATIONS OF PROPOSED MONITORING WELLS

SLUDGE AREA
RUNOFF BASIN

WELL NO.	NORTH/SOUTH	EAST/WEST	APPROX. SURFACE ELEV. (FT)
M-1	S 21+20	W16+25	356
M-2	S 16+25	W 1+75	351
M-3	S 2+25	W17+25	359
M-4	N 7+25	W18+00	354
M-5	N 13+75	W 8+25	366
M-6	N 20+00	W 22+75	369
M-7	N 10+00	W 30+50	330
M-8	N 17+75	W 39+00	338
M-9	N 2+50	W 8+15	362

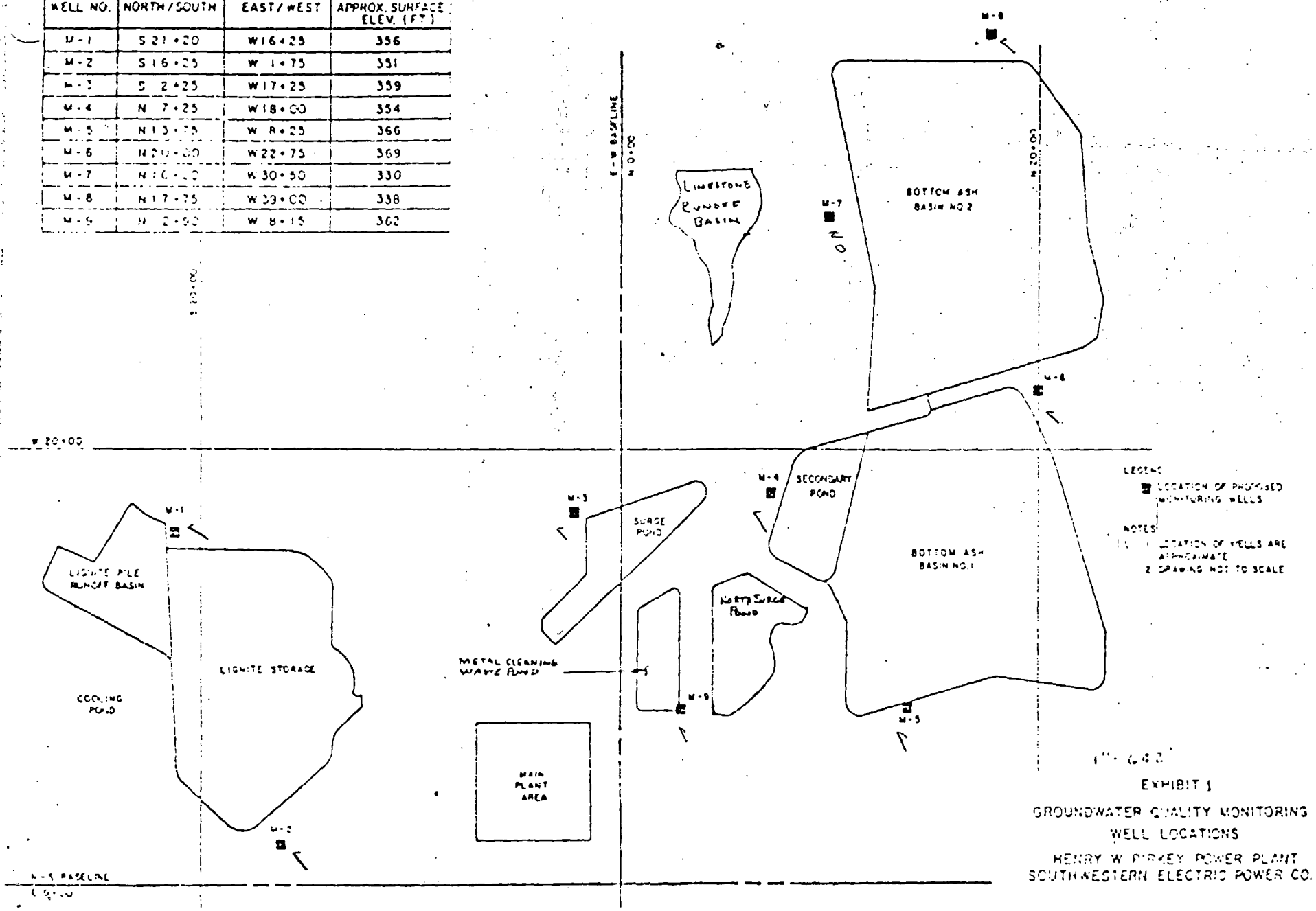


EXHIBIT 1

GROUNDWATER QUALITY MONITORING
WELL LOCATIONS

HENRY W. PIRKEY POWER PLANT
SOUTHWESTERN ELECTRIC POWER CO.

REFERENCE 14

RECORD OF COMMUNICATION Reference 14	[XXXX] Phone Call	[ ] Discussion	[ ] Field Trip
	[ ] Conference	[ ] Other (specify)	

(Record Of Item Checked Above)

TO: Frank Craig Water Superintendent Hallsville, Texas 214-668-2313	FROM: Pam Fetzer FIT Geologist U.S. EPA Region VI ICF Technology 214-744-1641	DATE: 5-10-89 TIME: 2:30 p.m.

SUBJECT: Water supply for the Hallsville, Texas area

SUMMARY OF COMMUNICATION:

The town of Hallsville is supplied with water by 4 wells, ranging from 280 feet to 318 feet with static water levels approximately 100 feet (below ground surface). The wells are screened in the Carrizo Band and the uppermost formation at Hallsville is the Sparta Sand outcrops in the area. Three of the wells were drilled by Layne - Texas and the fourth was drilled by Langford in Shreveport, Louisiana. There are no rural water districts, so residents receive water from private wells.

The alternate source of water is from the Sabine River (Longview). The intake is located on the Harrison Road, north of FM259 and west of 1845. The nearest downstream intake is in Logansport, Louisiana. Longview also receives their water from Lake Cherokee, 16 miles west of Hallsville.

He also said that Pirkey Lake is the Brandy Branch reservoir. They drained Rodgers Lake and extended the dam to hold more water and then called it Pirkey Lake. No drinking water comes from Pirkey Lake.

When asked about population, he said there were approximately 1,800 people in the city limits.

Pam Fetzer

EPA Form 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply Is Exhausted.

REFERENCE 15

RECORD OF COMMUNICATION Reference 15	[XXXX] Phone Call	[ ] Discussion	[ ] Field Trip
	[ ] Conference	[ ] Other (specify)	

(Record Of Item Checked Above)

TO: Gary Burton, Engineer Corps of Engineers 214-334-3990	FROM: Pam Fetzer FIT Geologist U.S. EPA Region VI ICF Technology 214-744-1641	DATE: 4-28-89 TIME: 10:30

SUBJECT: Intakes on and uses for Sabine River

SUMMARY OF COMMUNICATION:

Mr. Burton said that there were no drinking water intakes 15 miles downstream from Potter's Creek (south of the site). The river is used for fishing, but he thought no one boated or swam on it.

Brandy Branch reservoir is used also for fishing.

Pam Fetzer

EPA Form 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply Is Exhausted.