LAW ENVIRONMENTAL

REPORT OF SITE ASSESSMENT SERVICES

CTS CORPORATION

ASHEVILLE,NORTH CAROLINA

PREPARED BY

LAW ENVIRONMENTAL , INC

JOB NUMBER 55-7689

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August 31, 1987

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Attention: Marvin E. Gobles, P.E.
Manager, Plant Engineering

Subject: Report of Site Assessment Services
CTS Facility
Asheville, North Carolina
Law Project 557689

Gentlemen:

As requested and authorized by the CTS Corporation, Law Environmental has prepared this report of our site assessment services for the referenced site. Included in this report is our understanding of the project information, our scope of services, the results of all testing conducted, our conclusions and recommendations.

Please contact us with any questions that you might have concerning this report or the project in general.

Sincerely,

LAW ENVIRONMENTAL, INC.

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REPORT

OF

SITE ASSESSMENT ACTIVITIES

FOR

CTS CORPORATION
ASHEVILLE FACILITY
ASHEVILLE, NORTH CAROLINA

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1.0 INTRODUCTION

1.1 Purpose of the Assessment

CTS Corporation has been considering the sale of the subject facility and a potential buyer has expressed an interest in the property.

The purpose of this environmental assessment is to provide CTS Corporation with a general environmental liability status report of the facility. CTS Corporation wishes to assess, prior to the sale, the actual and potential environmental liabilities if any, associated with the subject property.

This report has been prepared on behalf of and exclusively for the use of CTS Corporation. A reasonable scope of services to evaluate the referenced site has been performed. The scope of services is described in Section 2.0 of this report. These services provide a "snapshot" of the general condition of the property at the locations actually sampled and only at the time of our study. An evaluation of the ground water beneath the facility was beyond our scope of services at this time. However, based on the information contained in this report, a ground water quality assessment is considered optional. This is discussed in the conclusions and recommendations section of this report.

1.2 Location and Description

The CTS Facility is located on Mills Gap Road, approximately one mile west of Sweeter Creek Parkway in Skyland, North Carolina as shown on Figure 1. Skyland is about five miles south of the

Asheville city limits. The facility consists of a 95,000 square foot brick veneer warehouse/light industrial building on an approximately 52 acre site. The building was constructed in about 1953. CTS purchased the property in about 1964. Since that time, it has been used for manufacturing of electronic components utilized in automotive parts and hearing aids. As many as 600 people were employed at the facility during peak production. Plant production operations ceased in April, 1986. During our site visit, several areas of potential environmental concern were observed in and around the facility. Electroplating operations have occurred at the plant, producing wastewater effluent and sludge (listed F006 waste). The plating operations room is centrally located in the back area of the plant. A one foot deep drainage acid brick-lined conduit leads from the plating area to a 2 feet by 2 feet sump. The sump drains to the Hazardous Waste Treatment Plant. The plant is a relatively small package treatment plant. Plating residues were removed, bagged and disposed of by a contractor to CTS.

Several storage tanks were also formerly located on site. No transformers containing PCB's have been used on the site. A large compressor room is present; however, recycled oils were not used in the compressors.

A small above ground tank was located upgradient of the plant in the equipment storage area. An air blowoff tank was located behind the plant outside the compressor room. Two underground storage tanks containing approximately 4,000 gallons of acetone and associated pumps and piping were located near the northwest corner of the building. These were reported to be in

good condition when excavated and removed by CTS personnel. A single above-ground storage tank for trichloroethylene has also been removed from the equipment storage area.

We understand that the facility was permitted relative to wastewater and air only. No RCRA permits have been issued for the facility. No known spills or releases have occurred at the site and no violations of environmental regulations have been issued for the facility.

The preceding information was provided to us by CTS personnel during our initial site visit.

2.0 SCOPE OF SERVICES

The following scope of services has been developed with CTS personnel during our site visit. During this evaluation we have collected data to determine the environmental conditions within: 1) the building shell, and 2) in soils near the ground surface. Probable pathways of potential contaminant migration have been evaluated during our site visit. For the purposes of this preliminary study, an evaluation of ground water conditions beneath the site has been excluded. The scope of services for this project has been divided into three tasks as follows:

Task 1 - Sampling and Analyzing Materials in the Building

The assessment work inside of the manufacturing building at the Asheville facility consisted of obtaining and analyzing a variety of samples from different locations in the plant. The principal types of samples taken included:

a) wipes

b) hand-augered soil

c) liquid

d) solid residue

The wipe samples were obtained to detect the presence and nature of contamination on surfaces in the building such as floors, walls, and horizontal surfaces (e.g. shelves, ducts, machines). Wipe samples were obtained using a 10cm x 10cm square template to delineate the area to be sampled. Gauze for the wipes was saturated with the appropriate liquid (hexane for the PCB and organic samples, sodium hydroxide for the cyanide, and acid for metals), wiped over the surface to be tested and placed

into prepared 8-oz plastic or glass containers. All containers and sampling supplies were prepared prior to sampling by Law Environmental National Laboratories (LENL) and transported to the site by the sampling team. These containers were then shipped to LENL for analysis. Sampling locations were selected by Law personnel in an effort to analyze worst case conditions. The locations of the wipe samples are indicated on Table 1 and shown on Figures 2 and 3.

The hand-augered soil samples were obtained using a stainless steel auger. The bucket-type auger was used to extract samples at discrete depths throughout the soil profile. The interior and exterior surfaces of the auger were decontaminated following the extraction of each load of soil. This served to minimize the spread of contamination from one strata of the soil to a lower one.

Oil samples were obtained by placing the liquid into a 40 ml glass vial using a stainless steel spoon.

Samples of solid residue were collected by scraping accumulations of the target material from the selected surfaces using a dedicated wooden tongue depressor for each sample. Samples were stored in 8-oz plastic or glass containers.

The soil samples in the plating room were obtained in the following manner:

1) A concrete coring machine was used to penetrate and extract the acid brick currently present in the plating sump area.
2) The brick core was removed to expose the underlying soil.

3) A stainless steel hand auger was used to extract soil samples from 6 inch intervals to a depth of 3 feet.

4) The soil samples were split and a composite sample formed along with individual samples from each depth interval.

5) The composite sample was analyzed for the parameters shown in Table 1. Contaminants were shown to exist in some samples. CTS was contacted and the option of analyzing the individual samples to determine the vertical extent of contamination was discussed.

6) Following completion of the sampling in the plating room sump, the cored hole was backfilled with soil from outside of the building and the acid brick was replaced.

In addition to the samples that were taken for laboratory analyses, continuous sample screening was performed on site using a portable organic vapor analyzer. This instrument was used to "screen" each sample to detect volatile organic contamination. After the samples were extracted, they were placed in a clean glass jar with aluminum foil seals. All samples were screened concurrently in a room under controlled conditions. Each sample was shaken and then allowed to volatilize for about five minutes prior to screening. After allowing the sample to volatilize, the instrument probe was placed within the sample jar headspace and the read-out observed. Any elevated readings (ie. 5+ ppm above background) were noted and an additional soil sample was taken from that area and held for potential future analysis. Use of this screening technique has enabled a large number of samples to be given a preliminary examination for organic contamination in

the field. This served to increase the efficiency of sample selection for subsequent laboratory analysis.

All of the sample locations were marked on a blueprint plan of the interior of the building and referenced through a unique tracking number specific to each sample. The samples were packaged and preserved (as appropriate) prior to shipping.

A chain-of-custody procedure was implemented for this project to ensure sample integrity from the field sampling point to the laboratory analysis location. A custody form was completed by all personnel handling the sample. This form accompanied the sample shipment to its final destination at LENL.

Table 1 summarizes the sampling activities for the interior building including number location and type of sample to be obtained and analyses to be performed.

Task 2 - Sampling and Analyzing Near Surface Soil Conditions

Outside of the building, the near surface soil conditions were explored with a series of shallow hand auger probes at selected locations as shown on Figure 2. The interior probes are described in the Task 1 description above. We performed 6 hand auger probes to a depth of about 4 feet. Samples were collected at 6-inch vertical intervals. Additionally, one sample composited from the individual samples was retained at each location. Our sampling equipment and methodologies were consistent with current EPA guidelines. All equipment was properly cleaned between locations to minimize cross contamination. The samples were screened in the field using an organic vapor analyzer. The composite samples were analyzed for

the EP Toxicity scan which includes metals, pesticides and herbicides. Additional parameters included cyanide, PCB's, and volatile organics. Based on the results obtained for each composite sample, additional soil samples were selected for analysis.

Task 3 Evaluation and Report Preparation

Following completion of the field sampling and laboratory analyses, the data obtained was evaluated by our staff. This written report was prepared. The report includes the following:

- o A description of sampling activities
- o A listing of all data collected
- o An evaluation of the data
- o Our conclusions and recommendations

3.0 SITE EVALUATION AND SAMPLE COLLECTION PROGRAM

3.1 Areas Outside of the Building

Several areas around the outside of the plant were formerly utilized in activities that handled hazardous substances. These areas include the trichloroethylene storage tank area, the acetone storage tank area with associated piping and pumps, oil storage tank, the hazardous waste storage area and the waste water retention pond. These areas of interest, which are discussed individually below, were included in the outside sample collection program.

3.1.1 Trichloroethylene Storage Tank

A single above ground storage tank for trichloroethylene was located on an excavated bench west of the plant. The tank, as well as other equipment stored in this location, has been removed from the site. A small steel mounting frame and gravel pad remain in the former location of the tank. According to CTS personnel, the tank operated on a gravity feed system to the plant. Fuel oil was later stored in the tank. Oil staining was observed on the gravel pad. Storm drainage from the equipment area has lightly stained the asphalt service road leading up to the bench.

Soil samples were extracted by a hand auger sampler in front of the gravel pad.

3.1.2 Acetone Pump Area/Pipe Swale/Underground Storage Tank Area

Two underground storage tanks containing acetone were formerly in place near the northwest corner of the plant

building. The tanks were reportedly capable of holding approximately 4,000 gallons of acetone each and were of steel construction. Leading from the tanks parallel to the west side of the plant were acetone transmission lines. These lines lead to two pumps located just outside the cleaning and paint rooms. This area was of particular interest due to the high accumulation of black paint residue observed. This residue covered piping which interfaced the pumps to the inside spray system, as well as portions of the building walls and pump mounting slab. A small flow of residue was also observed in the vicinity of the exposed piping.

Three sampling locations were selected near these areas. Hand augers were utilized to obtain the soil samples.

3.1.3 Above Ground Oil Storage Tank Area

A compressor air receiver tank, which was used to receive compressor oil, was formerly located near the southern portion of the plant outside the compressor room. The tank was removed after plant operations ceased. Up to 18 inches of oil-stained soil was reportedly removed from an area approximately 13 feet by 19 feet by a contractor for CTS. The area was backfilled with a coarse granular sand. In this area, oil staining was observed along the base of the plant wall.

Several hand augered borings were attempted in this area. Penetration below 12" was difficult due to the presence of concrete and asphalt back fill materials. Samples were collected one foot off of the granular backfill.

3.1.4 Hazardous Waste Storage Area

Hazardous Materials were formerly stored in a fenced area directly behind the facility. An asphalt pad surrounded by a 20 feet by 20 feet steel fence is presently in place. A sign identifying the area for storage of Hazardous Material is present. No staining, evidence of material spills, or leakage are visible. Drainage from the pad is to the east with water collecting in a low area approximately 15 feet from the asphalt pad. This area was considered an appropriate location for a representative sample of material that may have been flushed from the pad.

Soils were extracted from the area using a hand auger sampler.

3.1.5 Water Run-Off Retention Pond

A water run-off retention pond was previously used at the site as a part of the company's contingency plan. The pond is located approximately 125 feet north of the northwest corner of the facility. Presently, the pond is dry. A concrete discharge flume leads from the underground culvert on the south side of the pond to a large gate valve at the base. A pond water discharge culvert is located behind the gate valve on the north side of the pond. The area is overgrown with weeds and no surficial evidence of waste materials was observed.

A random sample location was selected and soils were obtained from discrete depths using a hand auger sampler.

3.1.6 Upgradient Background Sample

In an effort to examine the naturally occurring chemical composition of the site soils, the upgradient background soil was

sampled. The location of the sample was selected based upon known activities that have previously occurred at the site in relation to the site property boundaries. The sample location was approximately 125 feet south of the Hazardous Waste Treatment area.

Representative soils were obtained using a hand auger sampler.

3.2 Areas Inside The Plant Building

In an effort to establish the internal environmental quality of the facility, a material and soil sampling survey was conducted. Sampling points were selected based on known activities in these areas. The locations included the plating area, paint curing area, compressor room, boiler room, the hazardous storage area, the warehouse, and the Hazard Waste Treatment pit.

3.2.1 Plating Area

Plating operations were previously conducted in an 80 feet by 28 feet room centrally located near the back of the facility (Figure 3). Manufacturing processes which required the chemical rinsing of parts were performed in this area. Approximately one-third of the floor space is concrete. The other two-thirds is composed of acid resistant brick and masonry concrete. A one foot wide acid brick-lined drainage spillway divides the room.

It is our understanding that there are several small chemical storage areas within the Plating Room. These areas include a trichloroethylene (TCE) pit or sump, a sulfuric acid tank, and a sodium hydroxide tank. The TCE pit is approximately

7 feet by 7 feet and 2 to 3 feet in depth. The pit appeared to be relatively clean with no significant build up of waste sludge or residue. The pit is currently covered with several sheets of plywood. A wipe sample for volatile organic constituents was performed on the east wall of the pit.

A sulfuric acid tank and sodium hydroxide tank were formerly located on a concrete pad near the north wall. The drainage spillway entering the plating area from the dye room passes beneath the concrete pad. West of the concrete pad, there is an area where acid spilled from the tank and emptied into the drainage spillway. The concrete has been dissolved in this area exposing the underlying soil. No acid brick was utilized in the construction of the spillway in this location. Soil samples and sludge samples were collected from the exposed area.

Two other locations (PA-2 and PA-3) in the spillway were selected for sampling (Figure 3). The concrete floor slab and/or the acid brick were first penetrated and removed with a coring machine, exposing the underlying soil. A hand auger sampler was then used to obtain soil from discrete depths. Sludge and sediment samples near these two hand auger locations were also collected.

The drainage spillway leads to a collection sump in a room south of the plating area. The sump is approximately two feet deep, two feet wide, and two feet long. Sediment up to one foot in depth was encountered in the sump, prohibiting the use of a concrete coring machine. A core hole was performed one foot to the south of the sump. Soil samples were obtained using a hand auger sampler.

Wipe samples were also performed in the plating room to identify other possible source areas of contamination. The locations were randomly selected based on visible evidence of spill or splash residue. Four locations were selected; two on the north wall of the room and two on the south wall of the plating room.

3.2.2 Paint Curing Area

A small room located northeast of the plating area was formally used for a paint curing operations. The room is approximately 20 feet by 15 feet. A drainage spillway starts at the northwest corner of the room and leads into the plating area. Loose solids and accumulated sediment were sampled from the spillway.

3.2.3 Compressor Room

Several air compressor engines are located in a large room in the southern portion of the plant building. The compressors appeared to be in good condition with no excessive leaks and no evidence of spills were present. Oils used for lubrication are present in drip collection pans. It is our understanding that no oils containing PCB's or recycled oils have ever been used in the compressors.

In an effort to confirm the absence of PCB compounds from the area, oils and wipe samples were obtained from the compressor room. One wipe sample was obtained from an exposed surface near one of the compressors. The other was an oily liquid sampled from a drip collection pan.

3.2.4 Boiler Room

A boiler room is centrally located in the rear of the plant facility. The boiler has a one inch thick insulation coating of an asbestos material. The asbestos insulation has generally been enclosed with a layer of paint sealant. Sampling of the asbestos in the boiler room was conducted with an air sampling pump. The pump was placed on flat surface five to seven feet away from the boiler. The pump was run continuously for 24 hours, filtering the air to obtain the sample.

3.2.5 Warehouse

A large room at the west end of the plant was utilized as a parts warehouse. Shipping and receiving operations were conducted in the area. One large loading bay is located on the north side of the room. The warehouse is relatively clean and well kept. Several drums of unknown substances are stored in the northwest corner of the warehouse opposite of the the loading bay. Slight staining was observed near these drums, as well as on the base of the exterior wall outside the building. A wipe sample was obtained to confirm the absence of PCB compounds.

3.2.6 Hazardous Storage Area

A large room near the southeast end of the plant building was formerly utilized as a hazardous storage area. Hazardous Materials used in manufacturing processes were stocked in this area prior to use. The room is empty and no evidence of spills or releases are present. A wipe sample was obtained from the floor of the storage area.

3.2.7 Waste Pit

A large waste pit is located near the southwest corner of the plant building. The pit was formerly used for the treatment of waste waters generated by plant operations. The waste water effluent from the plating and paint curing rooms was treated at this location. Dimensions of the pit are approximately 25 feet in length by 10 feet in width and 6 feet in depth. The pit is covered with steel plates, one of which is hinged to allow access. Waste treating equipment used in and around the pit has been removed from the site. The waste pit is generally clean and very little sediment or residue remains. A sample of the residue was obtained from the east side of the pit.

3.2.8 Dye Room

A Dye Room is located near the southwest corner of the plant. Dyes utilized in manufacturing processes were formerly stored and maintained in this area. Dye residues are present throughout this room as well as outside the building near the pump assemblies. Solid residuum samples were collected from the dye room.

4.0 RESULTS OF THE SAMPLING AND CHEMICAL ANALYSES

4.1 Outside the Plant Building

Results of the chemical analyses performed on selected soil samples obtained from outside the plant area are summarized in Tables 2 through 4. Samples of the soil were obtained from discrete depths, then composited in order to provide typical near concentration that exist within the subsurface. Concentrations of various metals and volatile organic chemicals are either low or not detectable. Zinc was detected with laboratory extraction methods. Extracted values ranged from 0.06 mg/l to 0.25 mg/l with the highest values detected in HA-C-1. Trichcoroethylene was also detected in all the HA borings and the TC boring. Detected levels are generally low with values ranging from 6 ug/kg in HA-3-C to 380 ug/kg in HA-C-1. 760 ug/kg was also detected in HA-C-1. The laboratory report listing all chemical data generated from samples taken outside the plant building are available for review in Appendix A.

4.2 Inside the Plant Building

The results of the chemical analyses which were performed from soil, wipe, and solid liquid waste samples are summarized in Table 2 through 4. Hand auger soil samples were obtained from beneath the concrete floor in the plating area and near the waste sump. Solid, liquid and wipe samples were obtained from site specific areas within the plant building.

EP toxicity metals analyses resulted in concentrations below those which would define these materials as characteristic hazardous waste under (40 CFR sec 261). No PCB's were detected

in the compressor room or warehouse. Elevated levels of volatile organic constituents were detected in the plating area (HA-3, HA-4) and the paint curing area. Primary constituents present include trichlorethylene and tetrachloroethylene in the plating area with significant levels of xylene, hexane, (butylestar, acid) and decane. The suspected source of the volatile constituent contamination is from spills or leaks in the plating area and paint curing area. Lower levels of other volatile constituents were also detected and summarized in Table 4.

5.0 EVALUATION OF CHEMICAL ANALYSIS/CONCLUSIONS

Based on the results of field investigation, sampling program and subsequent analysis, Law Environmental has developed our understanding of the environmental conditions at the CTS plant and the occurrence of contaminants. The data obtained during this initial environmental assessment has lead to the following conclusions. Should any of the furnished information presented in this report be in error, we should be contacted to review our conclusions.

1) Listed hazardous constituents are present at the site. Volatile organic compounds (VOC's) were detected in the plating area and the paint curing area. VOC's were detected in the subsurface soils, as well as in residues and sludges.

2) The evaluation of ground water beneath the plant was beyond the proposed scope of services. However, due to the locations of the volatile organic compounds beneath the building, the potential for ground-water contaminants at the site appears to be minimal. Shallow site soils beneath the concrete floor slab are comprised of a generally low permeability clay material that has likely restricted the flow of spilled waste materials. Also, the area of concern is within the plant building and no leaching of the soils beneath the building through precipitation is likely. Hand augered soil samples (PA-3) analyzed for volatile constituents also demonstrated significantly decreased concentrations with depth.

6.0 RECOMMENDATIONS FOR ADDITIONAL ASSESSMENT

1) The presence of hazardous constituents at the site has been confirmed. However, the potential for ground-water contamination appears to be minimal. This conclusion could be verified through further assessment activities at the plant to include four to five shallow ground-water quality wells. The installation of these wells would establish the direction of ground-water flow and analysis of ground-water samples could then be performed to support our previous conclusions. It is recommended as a verification step in the assessment process.

2) Solid waste sediments and sludges are present in the paint curing area and plating area. This material should be removed from the site and disposed of in accordance with applicable regulations.