

Texas Disposal Systems Landfill, Inc.

v.

Penske Truck Leasing Co. L.P., et al

CIV No. 98-0159
207th Judicial District, Hays County, Texas

Report of
Robert M. Zoch, Jr.

June 4, 2004

Respectfully Submitted,

Robert M. Zoch, Jr., P.E.

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I. Introduction

1.1 Purpose – I have been asked by counsel for Texas Disposal Systems Landfill, Inc. (TDSL) to offer my expert opinion concerning sampling, testing, regulatory characterization, treatability and disposal options for various materials incident to the management of debris arising from a transportation accident on October 9, 1997 in Hays County, Texas, involving television cathode ray tubes (CRT). Based upon those evaluations, I was also asked to opine on the appropriateness of subsequent actions of the Parties to this litigation under applicable environmental Statutes, regulations and industry standards, including their responsibility under Superfund and other similar regulations. This report represents my current opinions on these matters based upon my education, professional experience and review of relevant documents. Should additional information become available, I may amend or expand upon these opinions.

1.2 Materials Reviewed – In developing my opinions in this matter, I have reviewed the following materials:

- Plaintiff's Fifth Amended Petition and Application for Permanent Injunction in the referenced matter.

- Plaintiff's Tenth Supplemental Responses to Request for Disclosure Under Rule 194.2.
- Fourth Amended and Supplemental Disclosures of Penske Truck Leasing Co., L.P., Penske Logistics, Inc., and Harry McCain (Collectively "Penske").
- Reports of Defendant's experts Neal Bolton, P.E., Kyle Shelton, P.E. and Fred Dalbey; supplemental expert report of Mr. Shelton.
- Deposition transcripts of Jesse K. Boultinghouse, Wade Wheatley, J.D. Porter, Gary Russell and Brian Weaver, together with selected exhibits to depositions taken during discovery in this matter.
- Plaintiff's Admitted Trial Exhibits, Vol. 1., April 12, 2004.
- Texas Ecologists, Inc. waste characterization form and stabilization recipe summary form for the "Zenith spill".
- A publication of the Rauland Division of Zenith Electronics Corporation (Zenith) providing an overview of its CRT manufacturing procedure.
- Project reports of SKA Consulting and HBC Terracon from February 2004 concerning the containerization of CRT debris commingled with municipal solid waste at the TDSL landfill.
- A video of the excavation and sampling of the waste material removed from the TDSL landfill, and earlier proposals outlining contractor scopes of work.
- Recent correspondence between TDSL and the Texas Commission on Environmental Quality (TCEQ) and a May 13, 2004 Notice of Violation from the TCEQ to Penske Truck Leasing.

Specific Bates Stamped documents I have reviewed are listed in Exhibit 1.

1.3 Credentials - I am a chemical engineer and a registered professional engineer in the State of Texas, having received a Bachelor of Science degree in Chemical Engineering from the University of Houston (UH) in 1968. I also attended graduate school at UH through 1971, extending my education in the fields of chemistry, civil engineering and chemical engineering. Since that time, I have attended numerous "short courses" concerning the technical aspects of groundwater protection, wastewater treatment and hazardous waste management, and have taught courses in workplace exposures to environmental hazards.

As an undergraduate, I worked for a pharmaceutical chemicals plant, and became involved in the plant's environmental control affairs in about 1965. Subsequently, after serving as senior plant engineer and plant manager, I became Director of Environmental Control for the parent company in 1972. In 1974 I formed an independent environmental

consulting company, providing engineering and regulatory support services to a broad range of industrial clients seeking to comply with emerging environmental regulations concerning air and water pollution control and industrial waste management. An important aspect of many project assignments has involved the interpretation of newly promulgated regulations and/or developing an understanding of regulatory agency interpretations of those regulations in fact specific circumstances.

After taking my company public in 1987, it was sold to a German corporation in 1990. I then headed the US based division of that international company=s environmental research and development organization, and have since returned to consulting by forming Zoch Consultants, LLC. In my current role, I provide consulting services primarily related to contaminated site investigation, remediation and impact assessment. Through all of this experience, I am familiar with the development, implementation and enforcement of the US environmental regulations over the past 35 years.

Since the 1970s, I have performed and/or managed hundreds of projects involving solid and hazardous waste issues including:

- site selection, design and permitting of municipal and industrial waste management facilities;
- characterization of waste materials and contaminated media under various State and Federal environmental protocols, specifically including RCRA, the Texas Solid Waste Disposal Act and the Texas Waste Code.
- contaminated property site investigation and remediation; and
- liability and equitable allocation of response costs under applicable provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended.

Many of these project assignments have included the regulatory characterization, development of treatment methods and evaluation of disposal alternatives for lead, as a significant contaminant of concern.

A current copy of my resume is attached as Exhibit 2. Additionally, matters in which I have testified over the past four years and my billing rate are included as Exhibit 3.

1.4 Summary of Opinions Concerning Waste Sampling/Characterization

1.4.1 CRT debris from Zenith's color television picture tube manufacturing process is a characteristic hazardous waste under §261.24 of the Resource Conservation and Recovery Act (RCRA) due to the excessive leachability of its lead content.

1.4.2 The waste profile prepared by Penske Truck Leasing in March 1998 properly identified the broken CRT/soil mixture as a hazardous waste, irrespective of any lead leachability testing. TECO's subsequent waste stabilization testing demonstrates the non-homogeneous nature of the mixed waste.

1.4.3 Sampling of the CRT debris commingled with municipal solid waste (MSW) extracted from the TDSL landfill was not representative of the actual mixture, and the related analytical results are irrelevant to the regulatory characterization of the combined wastes.

1.4.4 Although TCLP leachability does not directly correlate to the total lead content of a waste material, testing for total lead could have been useful for various purposes.

1.5 Summary of Opinions Concerning the Responsibility of Penske and Zenith for the CRT Debris

1.5.1 Penske, as the generator of the hazardous CRT debris, was responsible for its characterization and proper disposal as hazardous waste.

1.5.2 Zenith, as the owner of the in-process materials (the CRT units), is responsible under Federal and State law for the proper management of the debris resulting from the transportation accident and had, and continues to have, the obligation to remove its hazardous materials from the TDSL landfill.

1.5.3 Penske and Zenith, as the parties responsible for the generation and management of the CRT debris, must properly dispose of the hazardous waste now stored at the TDSL site.

1.6 Summary of Opinions Concerning Actions of TDSL in this Matter

1.6.1 The initial acceptance of CRT debris from the transportation accident by TDSL was proper.

1.6.2 The immediate response actions performed by TDSL upon learning that the CRT debris was a hazardous waste minimized the environmental impact and remedial costs caused by Defendants' improper management of their waste.

1.6.3 The entire management of this incident by TDSL has been appropriate considering the circumstances involved.

Pertinent background information is provided in the following section, followed by a discussion of the basis for each opinion stated above.

2.0 Background

A summary of some of the factual background I considered in formulating my opinions in this matter follows:

2.1 Zenith CRT Manufacturing Process – The CRT production line is a continuous process, requiring about 22 hours from beginning to end, to produce color television picture tubes. A simplified manufacturing description was produced by Zenith in this matter, describing the basic elements of the process. The four primary components of a CRT are:

- The Panel – A glass plate which forms the screen of the picture tube onto which various phosphor coatings are applied.
- The Mask – A thin, perforated metal sheet that directs the beams from the electron gun to the screen.
- The Funnel – A formed glass receptacle into which the electron gun is mounted and which is bonded to the panel utilizing a “frit” seal.
- The Electron Gun – The source of electron beams, directed through the mask, which then strike the phosphor coatings causing them to glow and form the color image on the screen.

The manufacturing process forms, cleans, coats, aligns and assembles these parts to exacting specifications to produce a vacuum picture tube known as a CRT. Further details of this process are not critical in this litigation, except for the toxic metal content of some components and the resulting regulatory characterization of related waste materials.

2.2 Toxic Metal Issues

2.2.1 Composition – The glass components of a CRT contain several regulated heavy metals, with lead exhibiting the highest concentration. Lead glass utilized for the panel reportedly contains 2.3-2.9% lead, while funnel glass contains 22.5-24.2% lead. Additionally, the glass frit used to bond the panel glass to the funnel is a lead zinc borate material, containing 65-80% lead oxide (about 60-74% lead) or possibly a lead aluminosilicate containing up to 90% lead oxide. A 19-inch Zenith CRT reportedly weighs 33 pounds and contains a total of 3.5 pounds of lead, or about 10.6% by weight. Although the precise distribution of this lead has not been made available, much of the 3.5 pounds per unit is obviously contained in the funnel glass and the frit seal.

2.2.2 Lead Mobility – Generally, the lead content of leaded glass is not considered water soluble since it is bound within the ceramic structure of the glass. The frit which joins the funnel to the screen, however, is described as “moderately soluble” in water, indicating the potential aqueous mobility of its lead content.

Under the hazardous waste regulations, any solid wastes containing designated toxic metals (such as lead) must be tested for leachability as a measure of constituent mobility. In accordance with Federal regulations, Zenith performed this testing on various samples of its production waste, with the following data produced from analyses conducted between 1988 and 1995:

Table 1

Testing for Lead in CRT Production Wastes

<u>Waste Material</u>	<u>Total Lead (mg/kg)</u>	<u>Leachable Lead (mg/l)</u>
Funnel Glass	225,000-242,000	10.2-22.0
Waste Frit (85% solids)	444,000	7000
Broken Glass from Process	410	119
Broken Picture Tubes	31,400	406

2.3 Response Actions Regarding Accident Waste – This case concerns the actions taken in response to the transportation accident on October 9, 1997 which caused the generation of hazardous CRT debris waste. The time line for those response actions is summarized as follows:

Table 2

Time Line for Response Actions

<u>Date</u>	<u>Response</u>
10/9/97	<ul style="list-style-type: none"> • Transportation accident caused damage and release of picture tubes on and adjacent to highway. Penske driver advised emergency responders that CRTs are not hazardous, resulting in arrangements for disposal of debris at TDSL. • Seven dump truck loads of broken CRT waste taken to TDSL with certification that they contained no hazardous waste. Five loads dumped on working face and two returned when notification received that waste was, in fact, hazardous.

- 10/10/97

 - Remaining waste from accident site placed in roll-off boxes and temporarily stored on TDSL property.
 - TDSL collected approximately 1 ½ roll-off boxes of commingled CRT waste from the surface of the landfill working face and contacted Penske/Zenith to coordinate removal of all hazardous waste from the site. Contaminated area of landfill was cordoned-off.
 - Penske acknowledged that it was the generator of the CRT hazardous waste.
- 10/16/97

 - TDSL sent written request to Penske and Zenith to remove the hazardous CRT debris.
- 12/2/97

 - Penske formally acknowledged that the CRT debris sent to TDSL was hazardous waste.
- 1/13-15/98

 - Penske mobilized a contractor to sort the waste stored in the roll-off boxes based on visual appearance. Two roll-off boxes were filled with hazardous CRT debris and five boxes were filled with non-hazardous debris from the accident (i.e. pallets, packing material, parts of the trailer, etc.)
- 2/3/98

 - TDSL again requests that Penske and Zenith remove all hazardous waste and reimburse TDSL for damages.
- 2/23/98

 - After additional request is rejected, TDSL filed its initial complaint against Penske and Zenith seeking removal of the hazardous CRT waste.
- 2/25/98

 - All mixed waste in the area of the landfill previously cordoned off was removed from the active portion of the TDSL landfill, isolated near the outside wall of the fill area and covered with clay.

- 3/23/98
 - After profiling the segregated hazardous waste, Penske arranged to dispose of the two roll-off boxes at TECO in Corpus Christi. The segregated non-hazardous waste from the accident was landfilled at the BFI landfill.
- 7/24/03
 - TDSL notified Penske and Zenith that their hazardous waste was a significant problem to site operations.
- 12/19/03
 - Penske agreed to assume responsibility as generator and arranger for disposal of commingled hazardous waste, but failed to accept financial responsibility for proper disposal.
- 1/6/04
 - Zenith represented that the CRT debris commingled with MSW is not hazardous waste unless it fails leachability test.
- 1/29 - 2/2/04
 - The mixed waste remaining in the isolation area of the TDSL landfill was excavated, sampled and placed into 99 roll-off boxes for final disposition.
- 4/12/ - 4/24/04
 - Trial in this case ends in mistrial.
- 5/13/04
 - TCEQ issued Notice of Violation to Penske, requesting documentation that the waste stored in the 99 boxes has been removed and properly disposed at an authorized facility.

3.0 Basis for Opinions Concerning Waste Sampling/Characterization

3.1 CRT debris from Zenith's color television picture tube manufacturing process is a characteristic hazardous waste under §261.24 of the Resource Conservation and Recovery Act (RCRA) due to the excessive leachability of its lead content.

RCRA was passed in 1976 and the first implementing regulations under the Act became effective during 1980 to require comprehensive management of solid waste nationwide. A solid waste was defined under those regulations as "any discarded material" not specifically excluded under very narrow definitions. Several sub-sets of solid waste were defined as "hazardous waste" including characteristically "toxic"

wastes, defined as those for which the extract of a representative sample exceeds specified limits. Solid waste containing lead meets the definition of a hazardous waste if the leachate from a representative sample exceeds 5 mg/l. Although RCRA has been reauthorized and numerous modifications and additions have been made to the supporting regulations and waste testing procedures, the threshold of 5mg/l of lead in a representative waste leachate continues to define a waste as hazardous under 40 CFR §261.24.

As discussed in Section 2.2.2 of this report, leaded glass would not be expected to leach excessive lead from its structure. As demonstrated by Table 1, however, the heavily leaded funnel glass somewhat exceeds the leachable lead standard. More importantly, the frit seal material exceeds the hazardous waste criterion by a factor of 1400. Test results of the homogenized components of "broken picture tubes" exceed the regulatory determination of lead toxicity by nearly two orders of magnitude. Consequently, Zenith has managed several of its process materials as hazardous wastes under RCRA, and broken picture tubes from transportation accidents in 1994 and 1996 were disposed of as hazardous waste. There is no question that the CRT debris from the October 9, 1997 accident was also hazardous waste, as ultimately communicated by Zenith on that day through the use of "process knowledge", without the need for additional testing. That debris was a hazardous waste when generated at the accident site and was a hazardous waste when sent to TDSL and placed into the landfill. Additionally, although the intact picture tubes were not classified as hazardous materials under Department of Transportation (DOT) requirements, when broken they were hazardous waste under RCRA and, therefore, also hazardous materials under DOT.

3.2 The waste profile prepared by Penske Truck Leasing in March 1998 properly identified the broken CRT/soil mixture as a hazardous waste, irrespective of any lead leachability testing. TECO's subsequent waste stabilization testing demonstrates the non-homogeneous nature of the mixed waste.

When Penske arranged for the disposal of the sorted, containerized debris from the accident in March 1998, they were required to complete a waste profile form to notify TECO (the disposal site) of the waste characteristics. That profile properly identified the waste mixture of soil and picture tubes as D008 (toxic hazardous waste for lead), since the CRT debris generated at the accident site was known to meet that criterion. The mixture, reported at that time to contain 70% soil and 30% broken tubes, was then subjected to stabilization testing by TECO to meet the Land Disposal Restrictions, which required that D008 waste be treated prior to disposal. The sample tested by TECO was obviously not homogenous, since testing of four replicates of the treated material indicated leachate lead concentrations ranging from <0.10 to 2.34 mg/l. Multiple samples of the untreated waste would likely exhibit an even greater range of leachate lead concentrations, above the hazardous waste criterion. This testing demonstrates the difficulty in obtaining a representative waste sample of soil mixed with solid debris. Even the debris was not homogenous since glass, frit and inert parts of the CRTs exhibited wide ranges of lead concentrations and lead leachability. The TECO stabilization tests were not meant to be a substitute for waste characterization and did not

produce data representative of the CRT waste mixture. The soil/debris mixture sent to TECO by Penske was a hazardous waste as formally acknowledged by Penske.

3.3 Sampling of the CRT debris commingled with municipal solid waste (MSW) extracted from the TDSL landfill was not representative of the actual mixture, and the related analytical results are irrelevant to the regulatory characterization of the combined wastes.

When the isolated CRT/MSW mixture was excavated earlier this year, a composite sample of every other roll-off box was prepared by mixing "three to five" random grab samples from every third and sixth trackhoe bucket of commingled waste. This technique was performed to obtain representative samples of the mixed waste under the assumption that the material was "homogenous". Based upon my experience with municipal solid waste and my review of the sampling video, I am certain that the materials sampled were not homogenous and that the samples taken were not representative. From the field notes, only three samples contained glass of unspecified appearance, and it is uncertain whether any of the CRT residue was included in the hand picked grab samples. Because of the heterogeneous nature of MSW and the random distribution of CRT debris within it, there is virtually no way that a representative sample of this commingled waste was obtained.

In any case, the lead leachability of the commingled waste is irrelevant to the regulatory characterization of the waste under RCRA §268.3 which prohibits dilution as a substitute for treating restricted waste under the Land Disposal Restrictions. It is not permissible to "de-characterize" a waste under §261.3(d) by mixing it with non-hazardous waste. Since the CRT debris was characterized as a hazardous waste (D008) at the accident site, its commingling with municipal solid waste rendered the entire mixture hazardous, irrespective of subsequent testing. That mixture, now stored in 99 roll-off boxes at the TDSL site, remains a hazardous waste. This regulatory interpretation is reinforced by the TCEQ determination of January 15, 2004, which cites the dilution prohibition of §268.3. All of this material must, therefore, be managed as hazardous waste.

3.4 Although TCLP leachability does not directly correlate to the total lead content of a waste material, testing for total lead could have been useful for various purposes.

A fundamental requirement for proper characterization of a solid waste under RCRA is that representative samples of the waste be tested. Since CRT debris contains large concentrations of total lead exhibiting widely varying leachability, one test of sample representativeness would be to test the sample for total lead. Applying "material balance" considerations, representative samples of the TECO waste mixture and the CRT/MSW mixture should have contained roughly 3.2% and 0.30% respectively of total lead, if the estimated number of picture tubes were actually contained within each mixture. Although the resulting leachable lead concentrations cannot be directly calculated using those percentages, analyses for total lead would have provided an indication of how representative the samples were.

Total lead testing could also have been useful to perform a rough "material balance" on the ultimate partitioning of the CRT lead waste transported to TECO and that remaining at the TDSL site. For example, the percentage of the lead waste at TDSL has been estimated at 18.1%, based on the number of stainless steel bands recovered for off-site disposal. This percentage underestimates the amount of hazardous debris remaining at TDSL because the equivalent amount of broken glass associated with those bands was likely not removed from the landfill. Significant amounts of packing material, refuse and soil in the mixed CRT waste hauled to TECO and that remaining at TDSL complicates material balance estimates concerning the fate of the hazardous CRT components (i.e. funnel glass and frit). It is certain that when bands were removed from the landfill working face, some portion of the glass remained. Absent any analyses for total lead in the waste mixtures, it can only be concluded that the amount of hazardous waste in the 99 roll-off boxes remaining at TDSL exceeds 18.1% of the hazardous waste originally generated at the accident site.

4.0 Basis for Opinions Concerning the Responsibility of Penske and Zenith for the CRT Debris

4.1 Penske, as the generator of the hazardous CRT debris, was responsible for its characterization and proper disposal as hazardous waste.

Penske was transporting the picture tubes at the time of the accident and was responsible for the proper characterization of the CRT debris at the time it was "generated" at the site. To the extent they chose to use Zenith's "process knowledge" that the debris was hazardous, it was their responsibility to immediately inform the emergency responders of that characterization. Although Penske possessed that knowledge within their organization prior to the accident, it was not communicated to their driver or to other on-scene personnel until after removal and disposal of the CRT debris was initiated. As a result, Penske's driver told emergency responders at the accident scene that the debris was not hazardous. If they had wished to confirm or refute Zenith's process knowledge by testing representative samples of waste from the accident site, they should have informed the emergency responders of their intentions and expeditiously conducted the sampling and analysis. Alternatively, they should have arranged for the collection and temporary storage of the CRT debris pending characterization and notification to the TCEQ. Their inadequate training of the driver and their lack of action to respond to this emergency resulted in disposal of some restricted waste at an unauthorized site. The Notification of Violation issued to Penske by the TCEQ on May 13, 2004 and the attached Summary of Investigation Findings confirm these interpretations.

4.2 Zenith, as the owner of the in-process materials (the CRT units), is responsible under Federal and State law for the proper management of the debris resulting from the transportation accident and had, and continues to have, the obligation to remove its hazardous materials from the TDSL landfill.

The picture tubes involved in the accident were being transported by Penske from Zenith's manufacturing and warehousing locations in Illinois to their assembly plant in Mexico. Consequently, Zenith was the owner of the in-process materials, and continued to own the CRT debris. They were required to immediately report the spill under §302.6 of CERCLA and §327.1 through §327.5 of the Texas Waste Code. Under Federal and State law, Zenith is a party responsible for the improper disposal of their waste material which they knew to be characteristically hazardous.

In correspondence sent soon after the accident, Zenith claimed the "useful product defense" to their liability under Superfund. In my technical experience in analyzing that defense, I have concluded that a manufacturer claiming the useful product defense has a difficult burden of demonstrating that the disposal was actually an arm's length sale of a commercial product at the then-existing market price. In this case, the CRTs in transport were not yet a commercial product and, more importantly, after the accident the debris was not sold, but rather disposed of as a waste. In my opinion, Zenith is not entitled to the useful product defense under the relevant facts of this incident, and they would meet the definition of a responsible "person" under §107(a) of CERCLA for any costs incurred in responding to the release or threat of release of lead from the CRT debris.

The October 9, 1997 event was not the first transportation accident involving CRT debris where Zenith, as the owner of the materials, was obligated to perform a waste characterization and to direct waste disposal actions. Following a similar accident that occurred on the same date in 1994, Zenith advised their transportation agent, G.E. Transport, that "if any of the tubes were broken, that would change the classification to hazardous material, and she [G.E.'s dispatcher] must return all material back for proper handling by Zenith." They further concluded that if the landfill thought to have received the CRT debris couldn't accept hazardous materials, "Zenith will require an approved carrier to go into this landfill and haul the material to an approved site." As a result of this incident, Zenith representatives "[took] charge of the matter" and planned "to establish a procedure for future accidents of this nature."

Nevertheless, two years later on October 8, 1996, Zenith was again required to respond to a transportation accident involving its CRT picture tubes. This time, they advised the emergency responder that the CRT debris "should be handled as a hazardous material" and "transported to a hazardous waste site." They also notified Federal and State environmental programs of the hazardous material release, as is their obligation under applicable regulations. In that case, Zenith acted properly to inform the appropriate emergency responders, Federal and State environmental authorities and waste disposal facilities of the nature of their hazardous CRT debris, and they coordinated its proper disposition.

Even with this recurring experience demonstrating that transportation accidents would result in Zenith's in-process materials becoming hazardous waste, they failed to anticipate and adequately respond to the 1997 incident. As a result, they are now obligated to properly characterize and remove their hazardous waste from the TDSL

landfill which, from prior experience, they knew would be necessary under the circumstances involved.

4.3 Penske and Zenith, as the parties responsible for the generation and management of the CRT debris, must properly dispose of the hazardous waste now stored at the TDSL site.

Under Federal and State law, the parties responsible for a hazardous waste must manage that waste from the point of generation through final disposition in accordance with applicable regulatory requirements. This has come to be known as "cradle to grave" responsibility for hazardous waste. Under the provisions of RCRA §268.3, the commingling of hazardous waste with other materials prior to its ultimate disposal does not relieve Penske and Zenith of this responsibility. Their waste and any related mixtures were hazardous when generated at the accident site on October 9, 1997, they were hazardous when improperly sent to TDSL, they were hazardous when some portion was sent to TECO for final disposition and the remainder in storage at the TDSL site is hazardous today, awaiting proper disposition. There is no excuse for Penske and Zenith's refusal to accept their responsibility for proper disposition of the remaining hazardous waste during the past six and a half years.

5.0 Basis for Opinions Concerning Actions of TDSL in this Matter.

5.1 The initial acceptance of CRT debris from the transportation accident by TDSL was proper.

TDSL had no basis to suspect that the debris from Zenith's broken CRTs was a hazardous waste. It had specific prohibitions against transporting restricted materials to its landfill and exercised appropriate controls to prevent unauthorized disposal. TDSL properly relied upon the regulatory requirements applicable to the waste generator and transporter to characterize their waste and, although Zenith and Penske possessed knowledge concerning the CRT debris characterization, it was not communicated to TDSL until after the initial disposal had occurred. Upon being informed that the material was a hazardous waste, TDSL immediately ceased receiving the waste, rejected two truckloads of waste preparing to dump at the site, ceased MSW disposal operations in the affected area and cordoned it off, notified the TCEQ of the incident and initiated discussions with the responsible parties for removal of the hazardous waste. These actions met or exceeded the requirements of its landfill permit and applicable hazardous waste regulations.

5.2 The immediate response actions performed by TDSL upon learning that the CRT debris was a hazardous waste minimized the environmental impact and remedial costs caused by Defendants' improper management of their waste.

The immediate response actions instituted by TDSL prevented the dumping of additional hazardous waste in their landfill. Steps taken to prevent the spread and/or burial of the existing waste minimized the ultimate volume of commingled waste, and the

collection of surface debris reduced the likelihood of contaminant migration. These provisions remained in place despite significant site operational difficulties they caused and, when the responsible parties failed to remove their hazardous waste, TDSL isolated and surveyed the waste within the smallest area possible. These actions minimized the release or threat of release of hazardous substances and adverse impacts upon human health or the environment, as acknowledged by the TCEQ in their May 13, 2004 letter to TDSL. Those efforts also controlled the costs of ultimately disposing of the commingled hazardous waste.

5.3 The entire management of this incident by TDSL has been appropriate considering the circumstances involved.

Because of the failures of Penske and Zenith to first notify TDSL that the CRT debris was hazardous and then their failure to remove the restricted waste from the landfill, TDSL has been placed in an extremely difficult regulatory position. If the commingled CRT/MSW hazardous waste remains at their landfill, major permitting, design, construction and operational changes will be necessary. The attendant agency review and public participation would be time consuming and expensive, and could jeopardize the entire municipal waste disposal business of TDSL.

On the other hand, off-site disposal of the hazardous waste by TDSL would subject them to potential future claims under Superfund. Zenith generates millions of pounds of hazardous production waste and debris annually, and disposes of that material off-site. Penske has already acknowledged its responsibility for the hazardous debris and has moved some of the waste off-site, but stopped short of properly completing the job. Those entities, through their actions, are already exposed to Superfund liability. It is inequitable for TDSL to become exposed to that liability because of the failure of Penske and Zenith to comply with the law and complete the off-site disposal of their hazardous waste.

Faced with this dilemma, TDSL has taken the appropriate action to segregate, contain and isolate the hazardous waste and to prevent adverse impacts to human health or the environment due to its presence at the site. These response actions have been performed under the continuing oversight of the TCEQ and its predecessor agency, which have acknowledged and approved TDSL's management of the incident.

EXHIBIT 1

Bates Stamped Documents Reviewed

Document date	Document	Bates Stamp
October 13, 1997 - October 27, 1997	Marcel Deposition Exhibit 29.	ZEN00487-ZEN00489
November 20, 1997	Letter from Wayne M. Koprowski to Gary Newton, Esq. (Deposition Exhibit 102).	TDS00158-TDS00159
January 13, 2004	Wheatley Deposition Exhibit 277.	TDS03056-TDS03065
November 11, 1997	Gregory Exhibit 42.	TDS00094-TDS00106
N/A	Wyckoff Exhibit 38.	ZEN00031-ZEN00035
July 13, 1993	Material Safety Data Sheet.	ZEN00718-ZEN00719
January 6, 1998	Letter from Suzanne Marcel to Tim Herman re: cathode ray tubes sent to TDSL's landfill (with attachments).	TDS00169-TDS00199
March 23, 1998	American Ecology Corporation Waste Disposal Information.	TECO0010- TECO0013
April 2, 1998	Teco Stabilization Recipe Summary Form.	TECO0033
March 13, 1992	PDC Laboratories, Inc. Toxicity Characterization Constituents (TCLP).	ZEN00432-ZEN00434
June 9, 1995	Peoria Disposal Company Waste Material Data Sheet.	ZEN00455
N/A	Zenith Electronics Corporation 1997 Hazardous Waste Report.	ZEN00496 and ZEN00499
N/A	Stabeno Deposition Exhibit 90 – handwritten notes.	TDS02355
N/A	TxDOT (Edward Villalpando) handwritten notes.	TDOT00016
N/A	Deposition Exhibit 23 – Verbal Spill Incident Checklist.	PTL223-PTL224
October 10, 1997	Deposition Exhibit 24 – Fax from Charles J. Smith, Penske to Don Holding re: Accident I-35.	PTL215
October 10, 1997	Deposition Exhibit 25 – Fax from Charles J. Smith, Penske to Jim Gregory, Texas Disposal.	PTL217
October 20, 1994	Zenith internal report of the incident re: G. E. Transport #236182.	ZEN00183-ZEN00192
January 1, 1997	Dedicated Vehicles Transportation Agreement, pages 1, 14 and 18.	PTL92, PTL105 and PTL109
October 7, 1997	Bill of Lading.	PTL74
October 27, 1997	Reszke memorandum to Zenith warehouse offices.	ZEN00827
October 17, 1997	Fax from Marcel to Althen enclosing internal MSDS, glass formulation, and laboratory TCLP testing on the leaded glass.	PTL75-PTL87

October 16, 1997	Fax from Althen to Ware enclosing partially completed disposal information sheet with an MSDS for the material.	TECO0001-TECO0006
N/A February 20, 1984	Publication of Rauland Division of Zenith. W. B. Swindle, Owens-Illinois letter to Paul Riopel, Rauland Corporation re data for funnels, neck glass and funnel body glass.	ZEN00688-ZEN00715 ZEN00448-ZEN00450
December 13, 1990 March 13, 1992	Zenith Rauland Waste Profile Sheet. PDC Laboratories, Inc., Toxicity Characteristic Constituents (TCLP).	ZEN00437-ZEN00438 ZEN00432-ZEN00434
July 1993 January 10, 1994	Zenith Material Safety Data Sheet. Procedure for Returning CRTs to Rauland, Plant #25.	ZEN00718-ZEN00719 ZEN01236-ZEN01239
January 21, 1994 Unknown	1992 vs. 1993 Summary of Waste Materials. Illinois EPA 1995 Hazardous Waste Report.	ZEN00172-ZEN00173 ZEN00532-ZEN00544
February 28, 1997 March 28, 1997 May 30, 1997	Zenith 1996 Hazardous Waste Report. Bill Rowe, Zenith-Rauland memo. Indiana EPA Form 8700-22 Uniform Hazardous Waste Manifest.	ZEN00514-ZEN00531 ZEN00671-ZEN00672 ZEN00082
May 30, 1997 May 30, 1997	Midwest Transport, Inc. Trip Ticket. Land Disposal Notification and Certification form.	ZEN00083 ZEN00084
May 16, 1997	Illinois EPA 8700-22 Uniform Hazardous Waste Manifest.	ZEN00085
None	Peoria Disposal Company Fingerprint Analysis, Scale Ticket 542316.	ZEN00086-ZEN00087
May 19, 1997	Illinois EPA 8700-22 Uniform Hazardous Waste Manifest.	ZEN00088
May 29, 1997	Illinois EPA 8700-22 Uniform Hazardous Waste Manifest.	ZEN00089
None	Peoria Disposal Company Fingerprint Analysis, Scale Ticket 543926.	ZEN00090-ZEN00091
May 31, 1997	Illinois EPA 8700-22 Uniform Hazardous Waste Manifest.	ZEN00092
May 31, 1997	Envirite of Illinois, Inc., Nonhazardous Certification	ZEN00093
April 29, 1997	Illinois EPA 8700-22 Uniform Hazardous Waste Manifest.	ZEN00094
None	Peoria Disposal Company Fingerprint Analysis, Scale Ticket 540013.	ZEN00095-ZEN00096
April 18, 1997	Illinois EPA 8700-22 Uniform Hazardous Waste Manifest.	ZEN00097
April 15, 1997	TMT Transport Inc. Ticket No. 5549	ZEN00098

April 18, 1997	"Hard Hammer" Wastes Interim Land Disposal Restriction Notification and Certification Form.	ZEN00099
April 25, 1997	Indiana EPA 8700-22 Uniform Hazardous Waste Manifest.	ZEN00100
April 25, 1997	Indiana EPA 8700-22 Uniform Hazardous Waste Manifest.	ZEN00102
April 25, 1997	Land Disposal Notification and Certification Form (UTS).	ZEN00104
April 25, 1997	Midwest Transport Inc., Trip Ticket 000204051.	ZEN00105
May 18, 1998	Peoria Disposal Company, Waste Material Data Sheet.	ZEN00679
	Zenith Corporation, 1997 Hazardous Waste Report.	ZEN00496-ZEN00513
January 15, 2004	Wade Wheatley, Texas Commission on Environmental Quality, letter to Bob Gregory, Texas Disposal Systems, Inc.	TDS03066
January 12, 2004	Bob Gregory, Texas Disposal Systems letter to Wade Wheatley, Texas Commission on Environmental Quality (with attachments).	TDS03056-TDS03065
October 21, 1996	J. J. Bradley, Zenith Electronics Corporation letter to Depart of Air Quality (with attachments).	ZEN00456-ZEN00460
October 16, 1997	Memo from Tony Marinello to PA. Grnhills.Paul-P.	PTL407
October 9, 1997	Hays County Fire Marshall's Office/Emergency Management report.	TDS01887-TDS01888
October 16, 1997	Tim Herman, Texas Disposal Systems letter to Marc Althen, Penske Truck Leasing.	TDS00090-TDS00091
January 16, 1998	Suzanne Marcel, Zenith Electronics Corp. letter to Tim Herman (with attachments).	TDS00169-TDS00199
January 19, 1998	Code 3, Inc., Report to Penske re: Segregate and Inventory Televisions in Buda, Texas.	PTL120-PTI129
January 8, 1998	Code 3, Inc., proposal to Penske re: Excavation of television picture tubes from landfill in Austin, Texas.	TDS01227-TDS01229
February 27, 1998	Code 3, Inc., Report for Excavation.	TDS00078-TDS00080

EXHIBIT 2

RESUME

ROBERT M. ZOCH, JR.

PROFESSIONAL HISTORY

Zoch Consultants
Nukem Development
ENSR Corporation
Marathon Manufacturing Company
Mineral Oil Refining Company

EDUCATION

B.S. (Chemical Engineering) University of Houston
Graduate Study (Chemical Engineering, Environmental Engineering) University of Houston
Environmental Short Courses in Air, Water, Groundwater, and Solid Waste

PROFESSIONAL REGISTRATIONS & AFFILIATIONS

P.E. (Chemical Engineering) Texas
American Institute of Chemical Engineering
National Society of Professional Engineers
Texas Society of Professional Engineers
American Chemical Society

TECHNICAL SPECIALTIES

Mr. Zoch has over 35 years experience in process and environmental engineering related to:

- Industrial Solid and Hazardous Waste Management
- Wastewater Treatment and Disposal
- Air Pollution Control
- Superfund RI/FS Process
- Waste Disposal Site Evaluations and Closure Plans
- Radioactive Waste, PCB and Asbestos Management
- Site Remediation Design and Implementation
- Petrochemical Process Design
- Process Technology R&D
- CERCLA Response Cost Allocation

REPRESENTATIVE PROJECT EXPERIENCE

- CERCLA RI/FS Investigations - Various Sites. Technical Consultant or Project Manager on many RI/FS investigations or oversight activities under EPA protocol including responsibility for overall technical direction and content; PRP representation before EPA and Department of Justice.
- Envirosafe Services of Texas, Inc. - Hazardous Waste Air Emissions Evaluation. Development of estimation techniques for air emissions from hazardous waste processing and disposal facilities, off-site impact analysis, design of appropriate controls, and public hearing testimony.
- Richmond Tank Car Company. Design of rail car cleaning and service facility including tank and hopper car cleaning racks, wastewater management, plastic product recycle, abrasive blasting and painting facilities.
- A.B. Chance Company - Hazardous Waste Lagoon. Site evaluation, development of closure plan and supervision of closure activities for a waste galvanizing pickle liquor (K062) lagoon, including environmental agency liaison and public notification.
- Houston Lighting and Power - Parish Plant. Modeling and field monitoring verification of ambient air impacts associated with lignite coal handling and storage.
- VETCO 3-C. Monitoring of emissions and evaluation of off-site impacts in residential areas associated with oil field pipe coating activities.
- Commercial Waste Injection Well. Overall design of commercial industrial liquid waste injection well facilities and expert testimony at public hearing.
- Texaco, Inc. - Industrial Waste Landfarm Evaluation. Evaluation of waste loading and degradation rates for an existing landfarm, and recommendations for operational modifications and monitoring improvements to extend its useful life.
- Marathon Steel. Design of an integrated source/fugitive air emissions control system for an electric arc steel making furnace shop, utilizing first-of-a-kind technology to capture hot, particulate laden gases during charging and tapping operations.
- Steel Casting Shops - Particulate Emissions Compliance. Numerous projects for steel casting facilities involving design of control systems and verification of performance through source testing.

- Industrial Waste Land Disposal. Design and permitting of various industrial waste land disposal facilities under state and federal statutes including RCRA and TSCA.
- Municipal Landfill Siting/Permitting/Operating Procedures. Various projects involving landfill site selection, permitting, operation, closure and post closure care.
- Marathon Battery Company - Heavy Metal Sludge Removal. Removal of nickel and cadmium sludges from underwater river sediments, separation from dredging water return flow, and landfill in a secure repository – in settlement of litigation under 1899 Refuse Act.
- Nuclear Sources and Services, Inc. - Low-Level Radioactive Waste Facility. Design of low-level radioactive waste storage and processing facility, including preparation of operating/safety plans and participation in public hearings.
- Record Storage and Disposal, Inc. Air pollution control system design and permitting for a medical waste incineration facility, including representation at public hearing.
- Lead Products Company. Assessment of soil and water contamination from recycle of lead/acid batteries and design of corrective action program.
- Recycle Plastics. Evaluation of potential off-site impact from a fluid bed incinerator applied to plastics pyrolysis and recovery.
- Industrial Waste Surveys. Surveys of industrial waste generation and disposal practices, with projection of trends under various economic and regulatory pressures.
- Marathon - MORCO - Chemical Wastewater Treatment. Physical separation and catalytic oxidation of petrochemical wastewater, along with discharge permitting and impact analysis on receiving stream.
- Texaco, Inc. – Refinery Closure. RCRA closure plan development, approval and project management for on-site landfill of refining waste and contaminated media.
- Toshiba International. Design and permitting of a thermal incinerator system for solvent emission control from process operations.

- Richmond Tank Car Company. Design, permitting and performance verification of a catalytic incineration unit for removing solvent emissions from rail car painting facilities.
- Rohm & Haas. RCRA permitting for Texas chemical plant; investigation and closure of related on-site and off-site industrial waste disposal facilities.
- C & H Die Casting Company - PCB Lagoon Closure. The development and implementation of a closure plan for a lagoon containing regulated levels of PCB by off-site disposal.
- Steel Mill - Wastewater Control. Wastewater segregation, pretreatment, and surface discharge permitting activities for a large integrated electric arc furnace steel mill.
- Refinery - RCRA Part B Permit Applications. Regulatory and technical direction in preparation of RCRA Part B Permit Applications for several integrated refineries around the country.
- Texas Star Scrap. Design, permitting and performance verification of air pollution control equipment on a secondary metals recovery furnace.
- Hudson Oil - Inactive Refinery. Site investigation and negotiation of RCRA Corrective Action Order for an integrated petroleum refinery. Project involved site-specific, risk-based limits on carcinogenic and non-carcinogenic Polycyclic Aromatic Hydrocarbons (PAH).
- TXI. Off-site impacts assessment and waste acceptance procedures associated with hazardous waste fuels used in cement kilns for RCRA BIF permit; participation in public hearing.
- Nukem Development - Process development and international commercialization of PCB decontamination and destruction processes.
- Texas TGV - High Speed Railroad Franchise. Environmental impact assessment for proposed multibillion dollar high speed rail project, including expert testimony at hearing.

- American Ecology Environmental Services. Development of expert opinions and testimony concerning release, fate and transport of chemicals and resulting exposures in workplace and surrounding neighborhood environments.
- Juncos Landfill Superfund Site. Evaluation of responsibility for hazardous substances and development of cost allocation methodology among industrial users of a municipal landfill.
- American Premier Underwriters, Inc. – Technical support and expert testimony in insurance claim for environmental damage.
- TexTin Superfund Site – CERCLA response cost allocation among the U.S. Government, former site operators, and suppliers of recyclable metals at a WWII primary and secondary smelter (War Plant case).
- Scaltech, Inc. – Technical support in patent infringement suit concerning refinery waste processing.
- Environmental Contamination Fingerprinting – Evaluation of contaminant sources and probable age of releases based upon environmental analytical data.
- DuPont – CERCLA action for contribution to cleanup costs at 15 plants containing numerous chemical and radioactive contaminants.
- General Motors – Allocation of response costs for solvent and metals contamination at diverse manufacturing plants.
- Wood Treating Plants – Investigations and corrective action alternatives for former wood treating plants involving creosote, pentachlorophenol, or chromated copper arsenate (CCA) treatment systems.
- Maywood Chemical – Evaluation and coordination of response actions to address radioactive and chemical contamination under State of New Jersey requirements, CERCLA, and the Federal FUSRAP program for radioactive material processing facilities.
- Forensic Investigations – Evaluation of plant process conditions and operating procedures which resulted in industrial exposures or injuries.

PUBLICATIONS

Zoch, Robert M., Jr., "Causes and Control of Fires in Sanitary Landfills," presented to Annual Meeting of the Texas Association of Solid Waste Management, Houston, Texas, 1971.

Zoch, Robert M., Jr., "Removal of Heavy Metals from Industrial Wastewater," presented to the Texas Water Pollution Control Association, College Station, Texas, 1975.

Zoch, Robert M., Jr., "Technical Aspects of Environmental Permits," presented to an Institute sponsored by the State Bar of Texas, Houston, Texas, 1980.

Zoch, Robert M., Jr., "Hazardous Waste Management Alternatives for the Acid/Clay Oil Re-Refining Process," presented to the Fourth International Conference on Used Oil Recovery and Reuse sponsored by the Association of Petroleum Re-Refiners, the U.S. Department of Energy, and the National Bureau of Standards, Las Vegas, Nevada, 1981.

Zoch, Robert M., Jr., "Groundwater Contamination Issues Related to Land Disposal of Industrial Wastes," State Bar of Texas, "Environmental Law of the 80's," San Antonio, Texas, 1984.

Zoch, Robert M., Jr., "You Don't Close a Refinery by Shutting it Down," presented at the Annual Meeting of the National Petroleum Refiners Association, San Antonio, Texas, March, 1985.

Zoch, Robert M., Jr., "When an HPI Plant Shuts Down," Hydrocarbon Processing, Gulf Publishing, October, 1985.

Zoch, Robert M., Jr. & Caputo, Dennis L., "Decommissioning Old Plants," presented at 67th Annual GPA Convention, Dallas, Texas, March, 1988.

Zoch, Robert M., Jr., "Superfund Remediation/RCRA Corrective Action and the Role of Risk Assessment - The Consultant's Perspective," presented at the Environmental Law Course, Dallas, Texas, November, 1989.

Zoch, Robert M., Jr., "Emerging Environmental Issues Facing Electric Utilities," presented at the Southeastern Electric Exchange, Pensacola, Florida, October, 1993.

EXHIBIT 3

Robert M. Zoch, Jr., P.E.

Matters in Which I have Testified in Last 4 Years

<u>Year</u>	<u>Type Testimony</u>	<u>Matter</u>	<u>For</u>
2004	Deposition	ESSO Standard Oil Company (Puerto Rico) v. Carlos Rodriguez Perez, Carlos M. Belgodere Pamies, et al. CIV No 01-2012 (SEC) (JA) U.S. District Court, District of Puerto Rico	Plaintiff
2003	Deposition	Gloria and Elgin Cole, et al v. Groendyke Transport, Inc. and Raymond Rice C.A. No. A-000311-C 128 th Judicial District Orange County, Texas	Defendant
2002	Trial	Homer Abron, Jr., et al v. Dean Lumber Co., Inc., et al C.A. No. 2: 99 CV 197 United States District Court Eastern District: Marshall Division, Texas	Defendant
2002	Deposition	Homer Abron, Jr., et al v. Dean Lumber Co., Inc., et al C.A. No. 2: 99 CV 197 United States District Court Eastern District: Marshall Division, Texas	Defendant
2001	Deposition	American Premier Underwriters, Inc. v. Certain Underwriters at Lloyd's London, et al C.A. No. A97-03088 Hamilton County, Ohio, Court of Common Pleas	Plaintiff
2001	Deposition	E.I. DuPont de Nemours, et al. v. United States of America, et al. CIV-97-497(JCL) District of New Jersey	Plaintiff

2000	Deposition	Virgie Adams, et al. v. American Ecology Environmental Services Corp., et al. CA No. 236-165224-96 236th District, Tarrant County, Texas	Defendant
2000	Deposition	Neil S. Platzer, et al. v. Trinity Industries, Inc., et al. CA No. DV-99-01537 14th District, Dallas County, Texas	Plaintiff
1999	Deposition	Linda Hamilton, et al. v. ASARCO, Inc., et al. CA No. 94-3420F, 94-3421F, 94-3422F 214th District, Nueces County, Texas	Defendant

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The billing rate for Robert M. Zoch, Jr. in this matter is \$225.00 per hour plus reimbursement of direct expenses at cost.