UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

WASTE MANAGEMENT DIVISION
RCRA ENFORCEMENT OFFICE

Purpose:	RCRA Compliance Evaluation Inspection
Facility:	**Titanium Metals Corporation (TIMET)** 8000 West Lake Mead Drive Henderson, NV 89015
Mailing Address:	P.O. Box 2128 Las Vegas, NV 89009
U.S. EPA ID Number(s):	NVD 009 562 471
Date of Investigation:	April 2, 2004
U. S. EPA Representatives:	Barry Cofer RCRA Enforcement Officer (415) 972-3303 cofer.barry@epa.gov Aubrey Baure RCRA Enforcement Officer
NDEP Representatives:	Frank L. Mabry Environmental Scientist Bureau of Waste Management (702) 486-3881 fmabry@ndep.state.nv.us Brian A. Rakvica Staff Engineer III Bureau of Corrective Actions (702) 486-2870
Facility Representative:	Mark Dunn Senior Environmental Engineer (702) 564-2544, x 422 mark.dunn@timet.com
Report Prepared By:	Barry Cofer
Report Date:	February 7, 2005

VP0679

PURPOSE OF INVESTIGATION

The purpose of this investigation was to determine the facility's compliance with the Resource Conservation and Recovery Act (RCRA), as amended, the regulations provided in the Code of Federal Regulations (CFR), Title 40, Parts 261-265, 268, 273, and 279, the Nevada authorized hazardous waste program in the Nevada Revised Statutes (NRS), Chapter 459, and the Nevada Administrative Code (NAC) Sections 444.842 through 444.980.

The scope of this inspection was constrained by the limited amount time available for the on-site inspection and by the inspectors' lack of specific process details prior to the inspection. Although the facility's regulatory history and some aspects of the manufacturing processes are discussed below, issues such as the current or past handling of non-exempt mineral processing wastes, and the scope and adequacy of the facilities' remediation efforts, were not determined. Waste generation, accumulation, and storage areas that were inspected are discussed below and shown in Attachment #1.

BACKGROUND

The Titanium Metals Corporation (TIMET), along with their subsidiaries and joint ventures, produces titanium and titanium alloy products at multiple locations in North America, Europe, and Asia. TIMET reports that about 75% of their titanium is used in the aerospace industries, and that TIMETal 6-4® (titanium alloyed with approximately 6% aluminum and 4% vanadium) is their most widely used alloy. TIPRO, a new TIMET subsidiary, is developing new uses for lightweight titanium in the growing automotive/motorcycle components and sporting goods markets (See http://www.timet.com/index_html.html and Attachment #2, page 4).

At their Henderson, Nevada operation, TIMET (or the "facility") produces titanium "sponge," a commercially pure, elemental form of titanium named for its sponge-like appearance, from rutile ore. The rutile ore is primarily mined from black beach sand in Australia.

BMI Complex

TIMET began producing titanium in the BMI industrial complex in what is now Henderson, Nevada in 1951.[1] The approximately 1.3 square mile complex was constructed by the War Assets Administration in 1941-1942 for Basic Magnesium Inc., which produced magnesium for aircraft and incendiary munitions during WWII. After war production ceased, the complex was leased to industrial tenants. In 1952 the tenants purchased the complex and formed Basic Management Inc. to manage the common assets.[2]

---

[1] The "Basic Townsite," which housed approximately 13,000 construction workers for the plant, formed the basis for the City of Henderson. The BMI complex is on county property.

[2] "Final Report of Phase 1 Environmental Conditions Assessment," 1993, p. 1-1.

Current and former major tenants of the complex include TIMET, Kerr-McGee Chemical Corp., Pioneer Americas, Inc. (formerly Pioneer Chlor Alkali Corp. and Stauffer Management Company), Montrose Chemical Corporation of California, Chemstar Lime Co., American Pacific Corporation (AMPAC), State Industries, and the Basic Power and Basic Water companies.

BMI Remediation

Manufacturing wastes from the BMI complex facilities were reportedly disposed of in a number of unlined ponds, landfills, ditches, and leach fields or infiltration ponds from the 1940's until regulatory controls were enacted in the 1970's. A 1981 study for EPA states that:

> *"Between 1945 and 1976, approximately 1.4 billion gallons of industrial wastewater (primarily inorganic wastes) were disposed of in unlined BMI ponds."*[3]

Information compiled by EPA in 1982 indicates that TIMET used unlined ponds managed by BMI from 1951 until 1972 and a BMI landfill until about 1979-1980 (Attachment #3). The 1982 document also indicates that TIMET's "J-2" landfill was previously used by another manufacturing facility at the site, and subsequent documents note the historical use by other site (complex) occupants of the BMI tailings ponds and Upper BMI ponds prior to TIMET acquiring their ponds.[4]

TIMET's 1993 two-volume "Final Report of Phase 1 Environmental Conditions Assessment" states:

> *"A Consent Agreement was entered into on April 25, 1991, between the State of Nevada, Division of Environmental Protection (NDEP) and certain present and former owners and operators of facilities at the BMI Complex, including TIMET. The Consent Agreement requires each participating facility to conduct an initial documentary environmental assessment (Phase 1)."*[5]

The State of Nevada's Department of Conservation and Natural Resources, Division of Environmental Protection (NDEP), Bureau of Corrective Actions stated in 2000 to a Nevada State Assembly committee that the characterization of the BMI site was complete. Soil and water sampling parameters in the characterization included:

- Pesticides - Lindane and DDT.

---

[3] Henderson Industrial Complex Hazardous Waste Investigation, U.S. EPA Contract 68-01-5052, June 1, 1981, p. 5-28. The total cited did not include discharges of the non-contact cooling water and the discharges from the Henderson sanitary treatment plants.

[4] "Final Report of Phase 1 Environmental Conditions Assessment," 1993, pages 1-4, 8-10.

[5] Page 1-1.

- Metals - Chromium, lead, mercury, and arsenic.
- Radionuclides- Uranium, thorium, and radium.
- Volatile Organics- Benzene, carbon tetrachloride, and chloroform
- Semi-Volatile Organics- Hexachlorobenzene, phenol, and phenanthrene.
- Asbestos
- Perchlorate

The 2000 testimony also noted that approximately 300 acres of the 2,400 acres of the upper and lower BMI ponds were used for waste disposal and needed to be remediated (Attachment #4).

In 2003, the NDEP stated they had been working with BMI for over 20 years on the cleanup and remediation of the complex (Attachment #5). According to TIMET representatives, there are approximately 200 monitoring wells at the facility. An NDEP Bureau of Corrective Actions engineer participated in this inspection.

Newspaper reports mention Basic Remediation, Basic Environmental, and the Landwell companies as BMI subsidiaries involved in the cleanup and development of BMI properties (Attachment #6). BMI occupant Kerr-McGee is also conducting an on-going remediation of a perchlorate plume in the nearby Las Vegas Wash.

REGULATORY HISTORY

TIMET submitted Part A of their permit application (EPA Form 3510-1) in November of 1980 for the treatment, storage, and disposal of a variety of hazardous wastes. In 1983, EPA determined that *"...The solid wastes produced in the sponge plant are excluded by 40 CFR 261.4(b)(7) from regulation as hazardous wastes..."* (Attachment #7). In May of 1984, TIMET withdrew their Part A and B applications (Attachment #8). In September of 1984, EPA moved to dismiss a RCRA enforcement case, stating *"...Respondent's primary process waste streams are not currently subject to regulation under Subtitle C of [RCRA]"*. (Attachment #9.) [6]

EPA's April 1998 Final Technical Background Document for the "Identification and Description of Mineral Processing Sectors and Waste Streams (Attachment #10) references in a footnote a Timet Corporation: Mineral Processing Waste Sampling Visit - Trip Report by IDF Inc. in August of 1989. The trip report document was not found in EPA Region 9's files and thus was not reviewed for this report.

---

[6] The original order was not available from EPA's archived RCRA files in time for this review (and is probably not pertinent to this report). EPA correspondence from June of 1983 refer to a Compliance Order, and "U.S. v. TIMET" (CV-LV-83-587-HEC) Complaint for Civil Penalties and for Mandatory and Injunctive Relief, dated August 26, 1983" is referenced in the "Final Report of Phase 1 Environmental Conditions Assessment," 1993, Appendix A, page A-7.

In 1999, TIMET agreed to pay $430,000 to settle Clean Air Act violations for sulfur dioxide emissions. TIMET installed a wet scrubber and reportedly returned to compliance in 1998.

TIMET was last inspected for hazardous waste compliance on June 26, 2002 by the NDEP (Attachment #11). The inspection confirmed TIMET was operating as a small-quantity generator of RCRA-regulated hazardous wastes, generating less than 1,000 kilograms of non-acute hazardous waste per calendar month and accumulating less than 6,000 kilograms of hazardous waste on-site at any time. No violations were cited.

PROCESS OVERVIEW

[redacted]

[redacted]

[redacted]

[redacted]

[7] http://www.timet.com/facilitiesframe.html

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

INSPECTION:

TIMET has approximately 400 employees. Mark Dunn, Senior Environmental Engineer, was provided a copy of the U.S. EPA Small Business Resources Information sheet and served as TIMET's representative during this inspection.

A review of selected hazardous waste manifests (Attachment #20) and TIMET's 2003 Hazardous Waste Report (which fulfills EPA's Biennial Report requirements in Nevada, Attachment #21) indicate TIMET is still operating as a small-quantity generator of hazardous waste. Oxidizing substances such as waste silver nitrate (EPA Hazardous waste codes D011 for silver and D001 for oxidizers), waste acids (D002 for corrosivity), magnesium metals (D001, and D003 for reactivity), and paint wastes (D001 for ignitability and F003 and F005 for spent solvents) are their largest waste streams.

Depending on activity, TIMET maintains between seven and nine "satellite" accumulation areas, which are located at or near where hazardous wastes initially accumulate.

---

[8] The process is named after scientists Fray, Farthing, Chen, and the University of Cambridge. A titanium oxide powder cathode, formed with a conducting wire, is placed into a molten bath of calcium chloride as an electrolyte, and oxygen is removed (reduced) at a carbon anode.

Henderson Technical Laboratory (K-53)

The Henderson Technical Laboratory (HTL) is a quality assurance/quality control lab for testing TIMET products. Titanium turnings from the lab (Attachment #1, photo 1) are moved to the scrap/reclaim area for return to the titanium production process. TIMET also buys and sells scrap titanium.

Vermiculite process drums containing "sweeps" from the laboratory were staged nearby (Attachment #1, photos 2-3). The vermiculite in the open container appeared dry, although it had recently rained heavily throughout the Las Vegas area (Attachment #1, photo 4). Sweeps contaminated with oil are sent to an off-site landfill (see Attachment #20, Texas Uniform Hazardous Manifest #02971748 from November 11, 2003).

Wiping rags with acetone are air-dried and disposed into the trash. Spent sand-blast grit (Attachment #1, photo 5), and chloride floor sweeps with slag (Attachment #1, photo 6) are sent to TIMET's on-site landfill. According to TIMET, the wastes are not expected to be hazardous, but were sampled after this inspection to prepare an updated profile (Attachment #14).

Research Lab

The 3-gallon cans accumulating spent solvents in the Research Lab were covered, but were not securely closed to prevent spillage if they were tipped over. TIMET has since purchased new containers for the labs that can be securely closed (Attachments #14 and #22). The solvents used were mainly acetones, methanol (both hazardous waste code F003) and methyl alcohol (D001). One lab can was not marked with the words "hazardous waste" (Attachment #1, photo 7).

TIMET has a Standard Operating Procedure for materials poured into the drain, including solvents used to clean laboratory glassware. Safety Kleen reportedly comes out monthly to labpack excess and waste chemicals.

21 Lab

Silver nitrate wastes accumulated in the 21 Lab are drummed and sent to TIMET's hazardous waste storage building. Containers accumulating waste solvents such as acetones and alcohols were all properly marked and dated.

FF10 Satellite Area

Photo #8 shows the FF10 aerosol spray can accumulation area. Note sign marking area, pallets providing secondary containment, closed hazardous waste accumulation drum with complete hazardous waste label, and spray can puncturing drum with filter for the vent hole.

Hazardous Waste Storage Area

The less-than-180-days hazardous waste storage area is posted, roofed, and bermed (Attachment #1, photo 9). The storage area includes a drum for aerosol cans (Attachment #1, photo 10), and universal waste lead-acid batteries on containment pallets. One of the batteries was broken (and thus open)(Attachment #1, photo 11). The contents of one open 55-gallon drum in the storage area contained what was determined to be trash, not hazardous waste (Attachment #1, photos 12-13). The total amount of RCRA-regulated hazardous waste in the storage area was approximately 90 gallons.

Universal waste fluorescent lamps and High-Intensity Discharge (HID) lamps are stored in a closed, marked shipping container near the 90-day storage area. A few of the boxes accumulating flourescent lamps were not sealed (Attachment #1, photo 14). Although some of the individual cartons accumulating waste lamps were not dated, an inventory noting the date and quantity of lamps brought into the container was posted on a wall inside the shipping container, demonstrating compliance with 40 CFR § 273.35(c). According to the facility representative, TIMET has two off-site shipments of lamps each year.

Surface Impoundments and Ditches

Newspaper reports indicate that TIMET maintains about 100 acres of ponds (Attachment #6). Due to time constraints, the surface impoundments (background of photo 15, Attachment #1), the active landfill (Attachment #1, photos 16-17), the outside equipment "boneyard," and the material storage areas (Attachment #1, 18-19) were not inspected. TIMET inspects the ponds daily (Attachment #23).

TIMET reports the HP-1 pond contains approximately 20 million gallons of magnesium chloride. As noted above, the magnesium chloride is no longer sold for dust control.

Non-contact cooling water is discharged under NPDES permit. TIMET has reviewed the Material Safety Data Sheets (MSDS) for their NALCO brand corrosion preventatives used in the cooling towers and confirms the chemicals do not contain chrome or chromated compounds (Attachment #14). As discussed above and demonstrated in Attachment #15, after neutralization the caustic scrubber blowdown discharged to the ponds is not a hazardous waste.

Landfills

TIMET has one closed and capped solid waste landfill and one open Class III solid waste landfill. Most of their trash is sent to Silver State's Apex municipal waste landfill. The on-site landfill receives production wastes including the chloride floor sweeps from the labs and spent refractory brick. TIMET has reviewed the MSDS for the Thermal Ceramics brand refractory brick placed into the on-site landfill and determined they do not contain RCRA-regulated levels of chrome or other toxic metals (Attachment #14).

"Francy's Mountain" is an accumulation of CSD solids. According to TIMET, the dried sludge does not contain RCRA-regulated toxic metals, but are "technologically-enhanced naturally occurring radioactive materials" (TENORM) wastes. The CSD solids contain radium

salts which were concentrated from the rutile ore. A newspaper reported TIMET may have once handled uranium in 1959 (Attachment #17), and uranium was included as a parameter in the BMI Site Assessment. TIMET noted their site, like the rest of the Las Vegas area, has detectable background levels of non-naturally occurring radionuclides due to past nuclear bomb tests at the Nevada Test Site.

Attachment #1, photos 16-17 show the J-2 landfill (background) and material storage area (middle). Photos 18 and 19 show the adjacent storage areas, with two blue 55-gallon plastic drums lying on their sides. TIMET assumed the drums were empty, and has since modified their daily inspection logs to include the J-2 landfill area and to look for empty or "forgotten" drums in miscellaneous areas of the plant (Attachments #14 and #23).

Paint Shop Satellite Accumulation Area

The paint shop accumulation area included drums on containment pallets within a bermed storage area, and several drums and a trash bin accumulating wastes outside of the containment area (Attachment #1, photos 20-21). Standing water from recent rains was observed inside the containment area (photo 20). The water was over the top of the containment pallets in the low end of the containment area, but had not overflowed the berms.

The accumulation area held both product and solvent-containing paint waste drums. The waste drums were not marked with the words "hazardous waste" or other markings to indicate the current contents. Several of the containers, included the spray can accumulation drum, were stored open (Attachment #1, photos 20, 22-24).

The trash bin contained paint solids, empty cans, and other wastes (Attachment #1, photo 26). TIMET has reviewed the appropriate MSDSs and stated the dried paint would not display any of the toxicity characteristics (via the TCLP) for toxic metals (Attachment #14).

During the inspection, TIMET closed the open containers (Attachment #1, photos 21, 25, 27-28). Subsequent to the inspection, TIMET improved housekeeping in the area and provided suitable containers with clear product markings (Attachment #24).

Other Areas

55-gallon drums accumulating used oil in two separate locations were not marked with the words "Used Oil" (Attachment #1, photos 29-30).

POTENTIAL VIOLATIONS

NAC 444.8632 Compliance with Federal Regulations Adopted By Reference:

Failure to comply with all applicable requirements of Title 40 of the Code of Federal Regulation (CFR) Part 2, Subpart A, Part 124, Subparts A and B, and Parts 260 to 270, inclusive, Part 273 and Part 279, as those parts existed on July 1, 2003, and as modified by NAC 444.86325, NAC 444.8633 and NAC 44.8634, including:

40 CFR § 262.34(a)(1)(i)	A broken (and thus open) lead-acid battery in the hazardous waste storage area was not sealed or placed in a closed container, as required by 40 CFR § 265.173(a).
40 CFR § 262.34(c)(1)(i)	Some containers accumulating hazardous waste in the laboratories and paint waste accumulation area were not stored closed, except when necessary to add or remove waste, as required by 40 CFR § 265.173(a).
40 CFR § 262.34(c)(1)(ii)	A container accumulating hazardous waste in a laboratory and a container in the paint waste accumulation were not marked with the words "Hazardous Waste" or other words that identified their contents.
40 CFR § 279.22(c)(1)	Two drums accumulating used oil were not marked with the words "Used Oil."
40 CFR § 273.33(d)(1)	At least one container accumulating universal waste lamps was not closed.

LIST OF ATTACHMENTS

1. Inspection photographs.
2. Titanium Metals Corporation 2003 Annual Report (selected pages).
3. EPA document "Background Material for BMI Briefing," 6/17/1982.
4. Doug Zimmerman, Minutes of the Meeting of the Advisory Committee to Examine Locating a 4-Year State College in Henderson, 6/16/2000.
5. Allen Biaggi, Minutes of the Meeting of the Assembly Committee on Natural Resources, Agriculture, and Mining, 4/7/2003.

6. Various newspaper reports on BMI cleanup and property development.

7. EPA memos regarding "RCRA Mining Exemption as it Applies to TIMET and FMC" dated 3/22/1983 and 6/24/1983.

8. TIMET letter withdrawing Part A and Part B of the permit application, dated 5/2/1984.

9. EPA Motion for Dismissal Pursuant to Stipulation, circa 9/1984, and related correspondence.

10. EPA Final Technical Background Document for the "Identification and Description of Mineral Processing Sectors and Waste Streams," 4/1998.

11. Nevada Division of Environmental Protection (NDEP) inspection reports, dated 6/26/2002, 8/9/2003, and 4/6/1999.

12. TIMET Process Diagrams.

13. Clark County Department of Air Quality Management, Draft Technical Support Document, Technical Information Presented in Review of an Application for a Part 70 Operating Permit, dated 12/1/2003.

14. TIMET letter transmitting requested documents to EPA, dated 4/15/2004.

15. TIMET Spent Caustic Analysis, 6/11/2003.

16. NDEP, Interim Guidelines on Dust Palliative Use in Clark County, Nevada, circa 3/2001.

17. Las Vegas Review-Journal article, "Source of Sample Disputed", 3/9/2001.

18. Oak Ridge National Laboratory, Summary of Emerging Titanium Cost reduction Technologies, 1/2004, selected pages.

19. FCC Cambridge Process information, various sources.

20. Hazardous Waste Manifests.

21. 2003 Hazardous Waste Report.

22. TIMET photo of new laboratory containers.

23. Environmental Daily Rounds Logsheet, revised Environmental Morning Report.

24. TIMET photos of paint accumulation area.

ATTACHMENT #1

All photos by Aubrey Baure using an Olympus D-510 Zoom digital camera and a 128 megabyte Smartmedia compact flash memory disk.

Photo 1: Drums of titanium turnings outside HTL.

Photo 2: Vermiculite drums outside HTL.

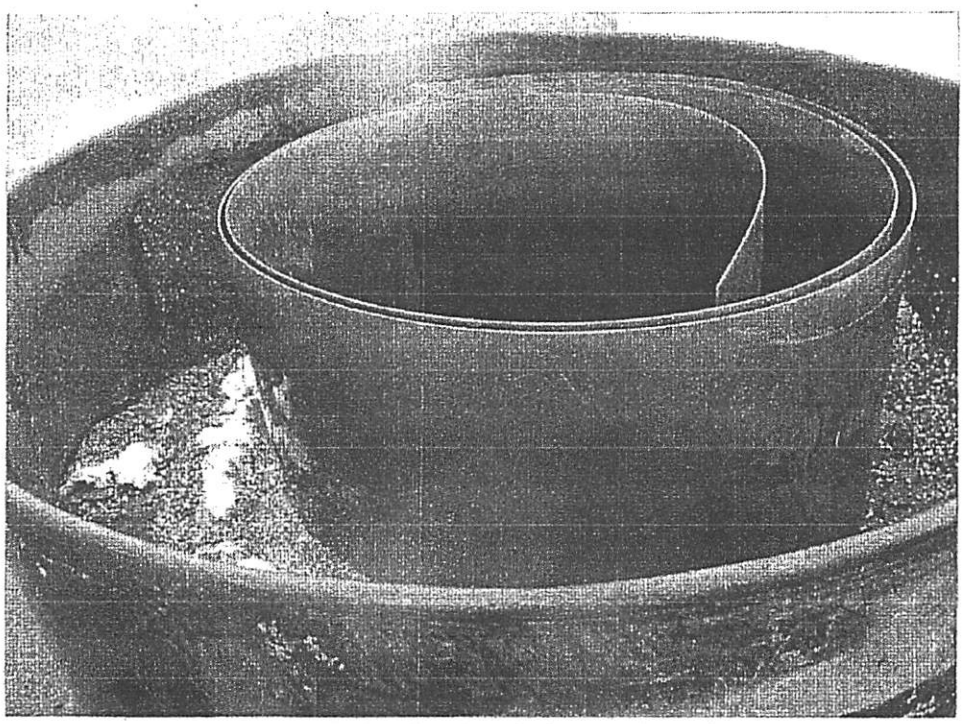
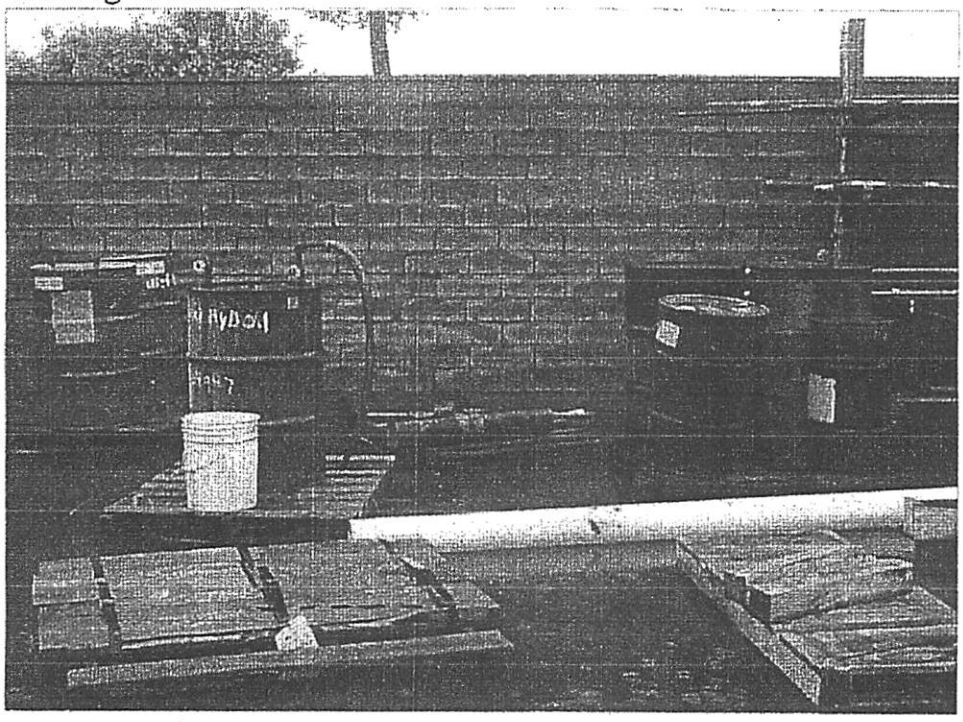


Photo 3: Inside open vermiculite drum shown above.

Photo 4: Materials stored outside labs on pallets to protect them from standing rainwater.



VP0679

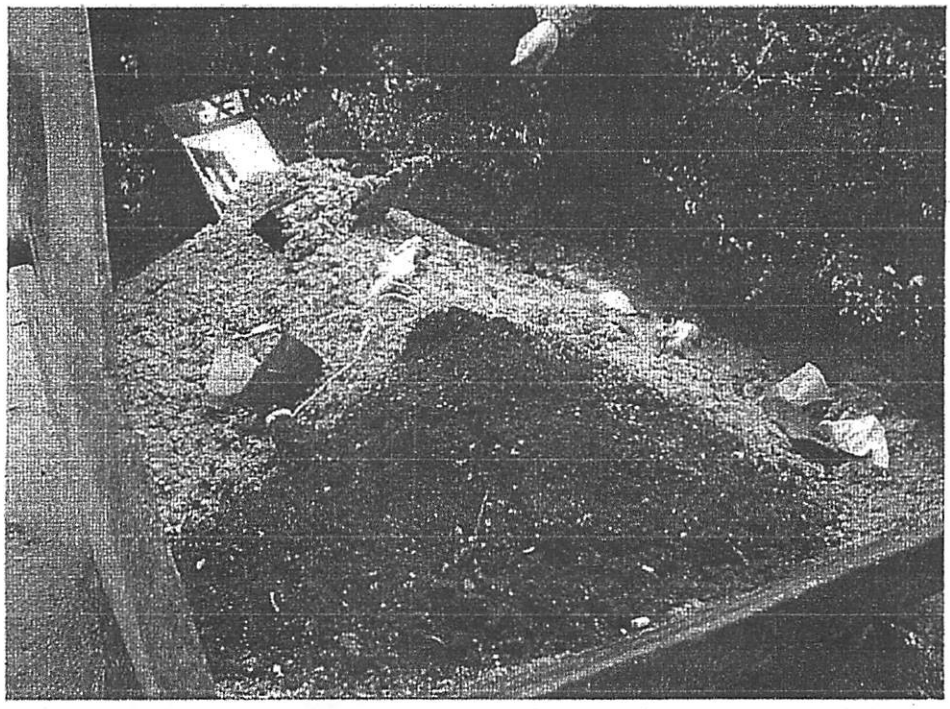


Photo 5: Wastes including sand blast grit go to the on-site landfill.

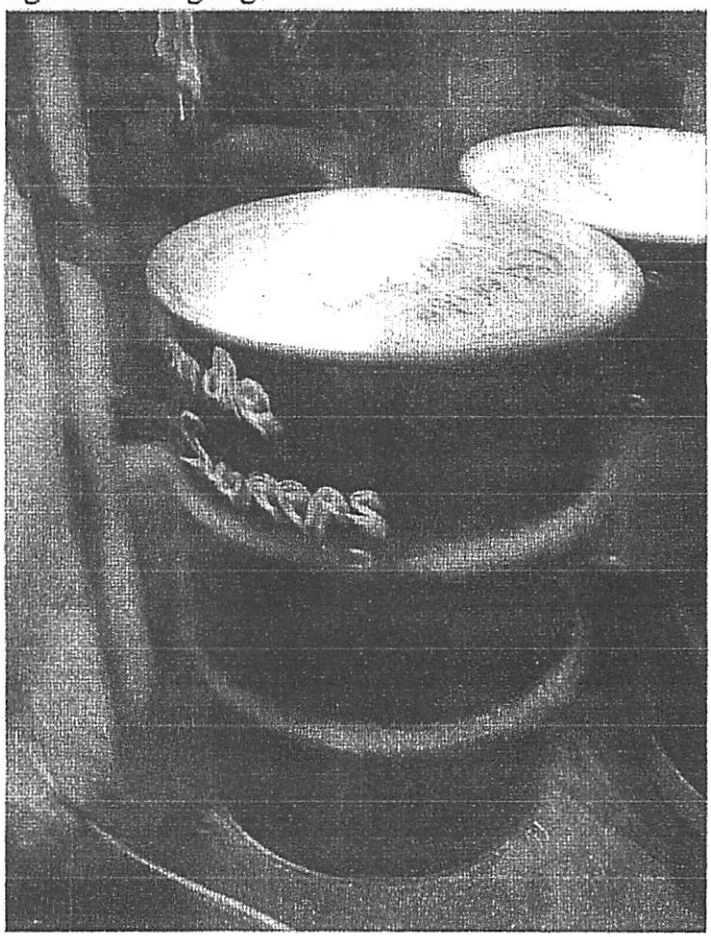


Photo 6: Chloride floor sweep drums.

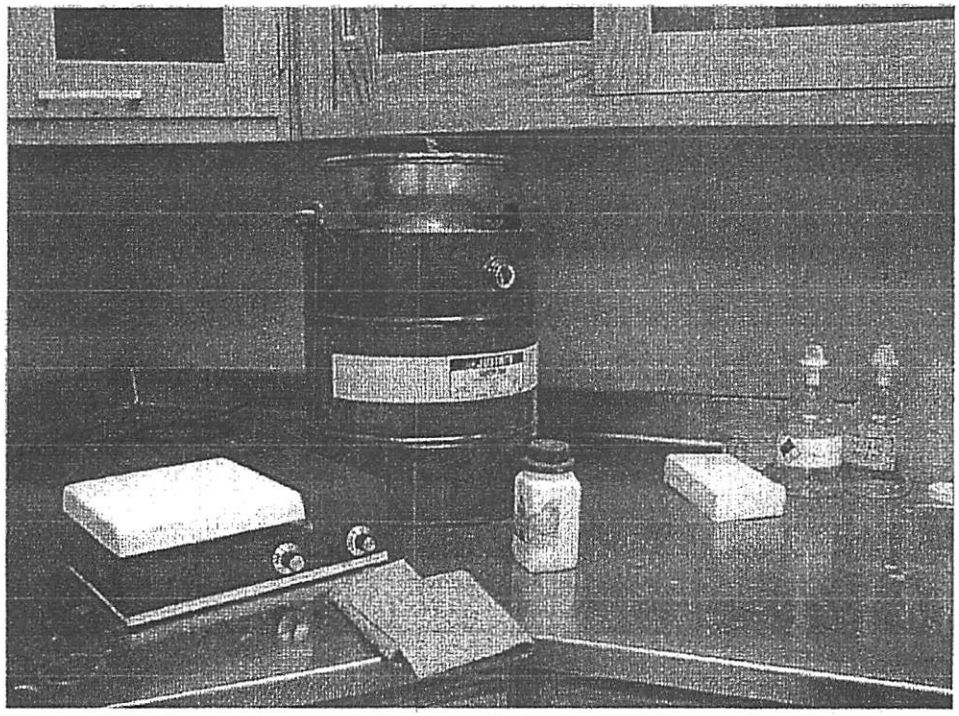


Photo 7: Lab waste accumulation safety can. Lid was closed, but can was not labeled.

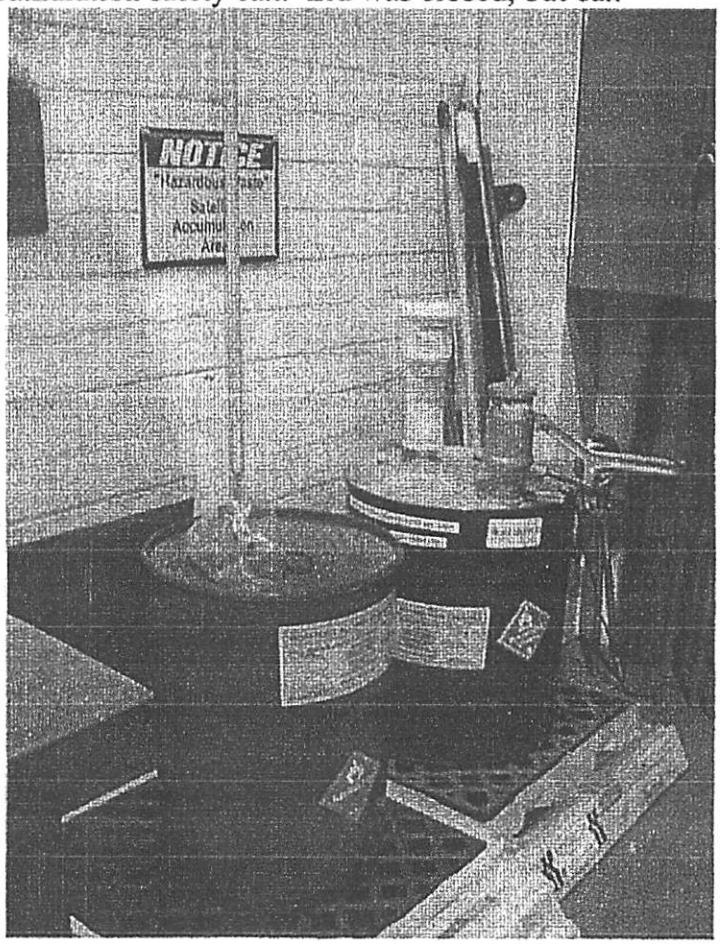


Photo 8: FF10 aerosol spray can accumulation area.

VP0679

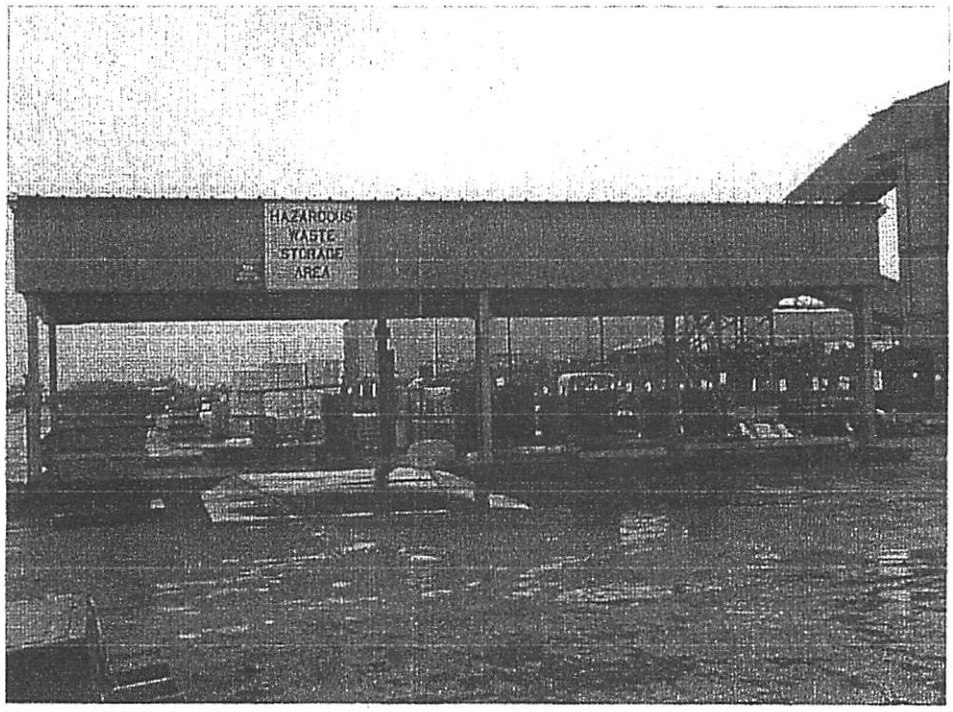
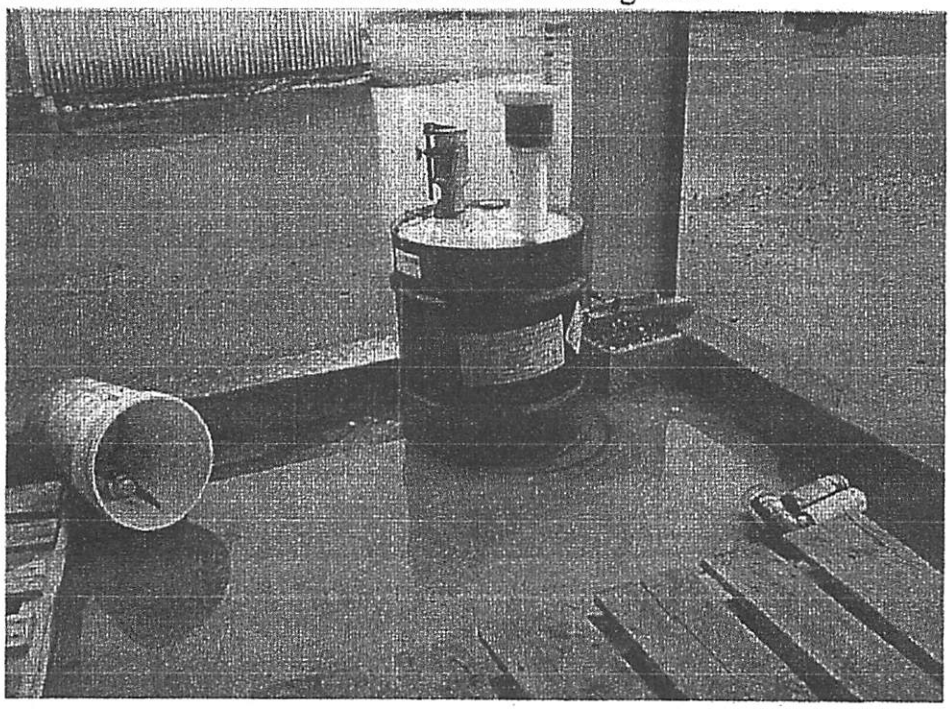


Photo 9: Hazardous waste storage area.

Photo 10: Aerosol accumulation drum in storage area.



VP0679

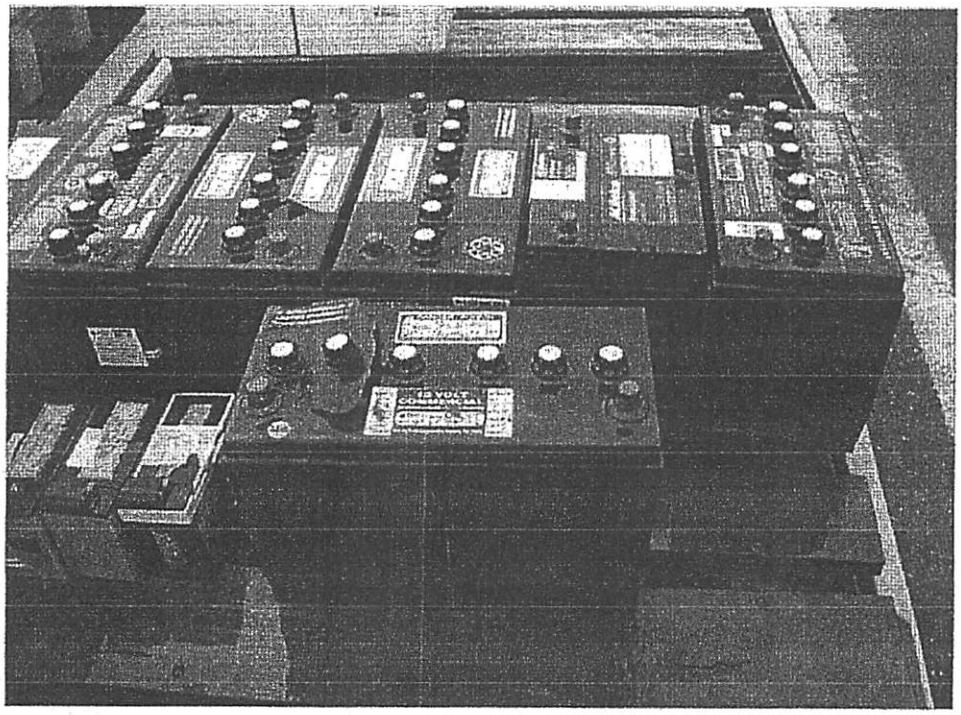


Photo 11: Broken lead acid battery on containment pallet.

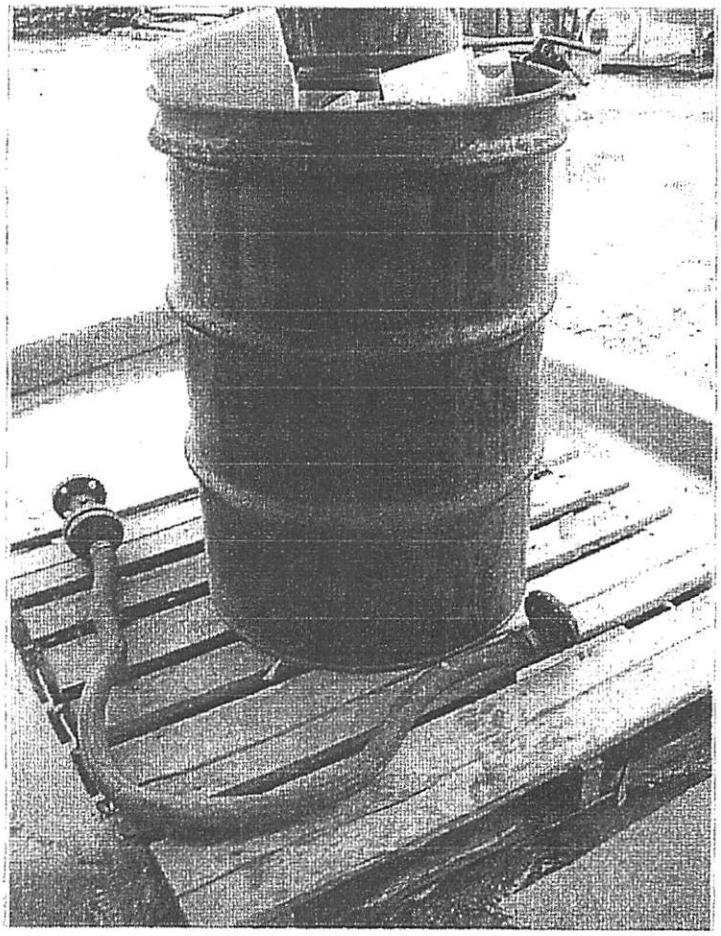


Photo 12: Drum containing what was later determined to be trash.

VP0679

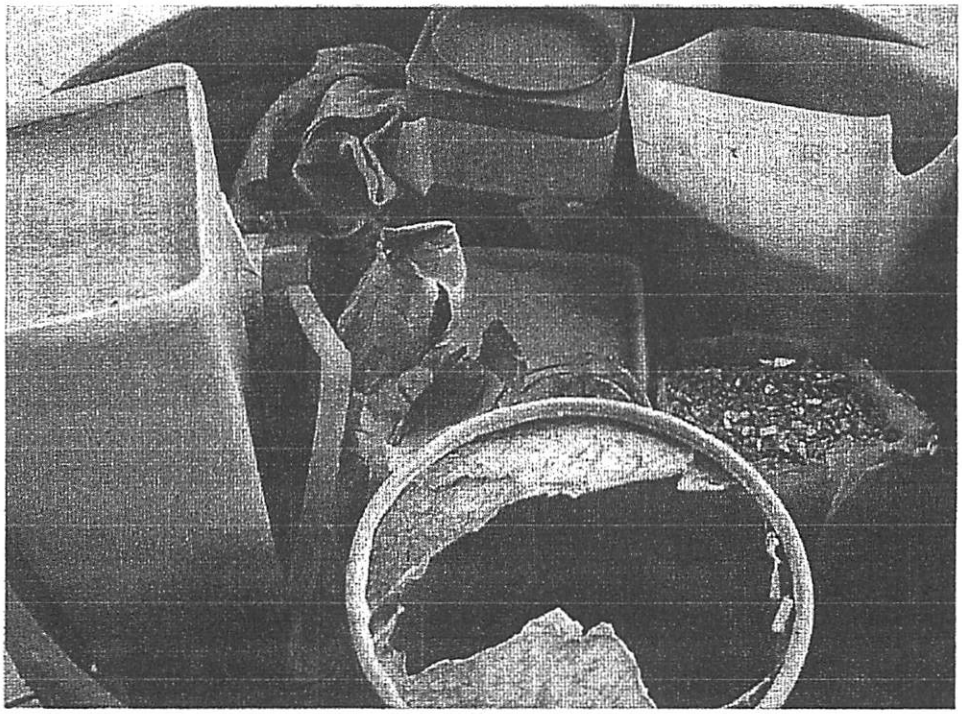
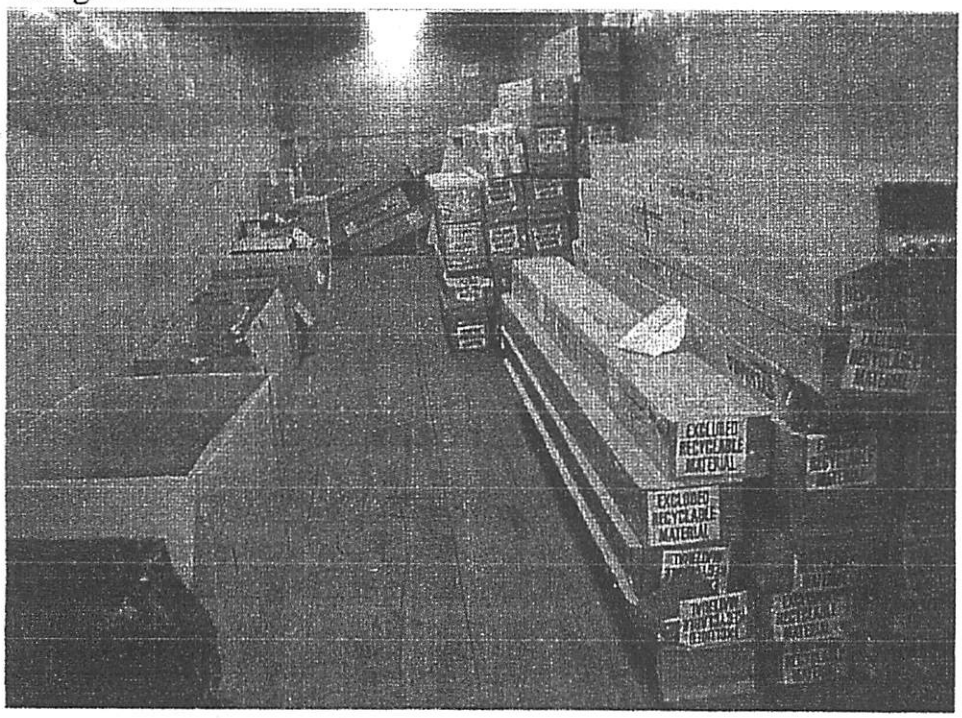


Photo 13: Inside of drum shown in Photo 11.

Photo 14: Interior of universal waste fluorescent and HID lamp storage container.



VP0679

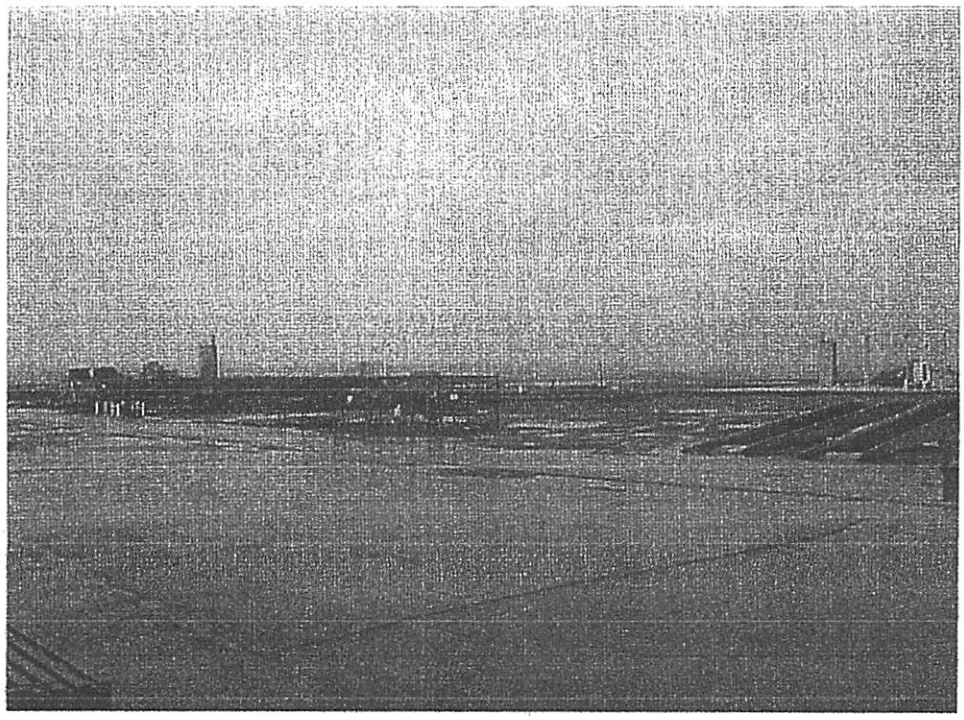
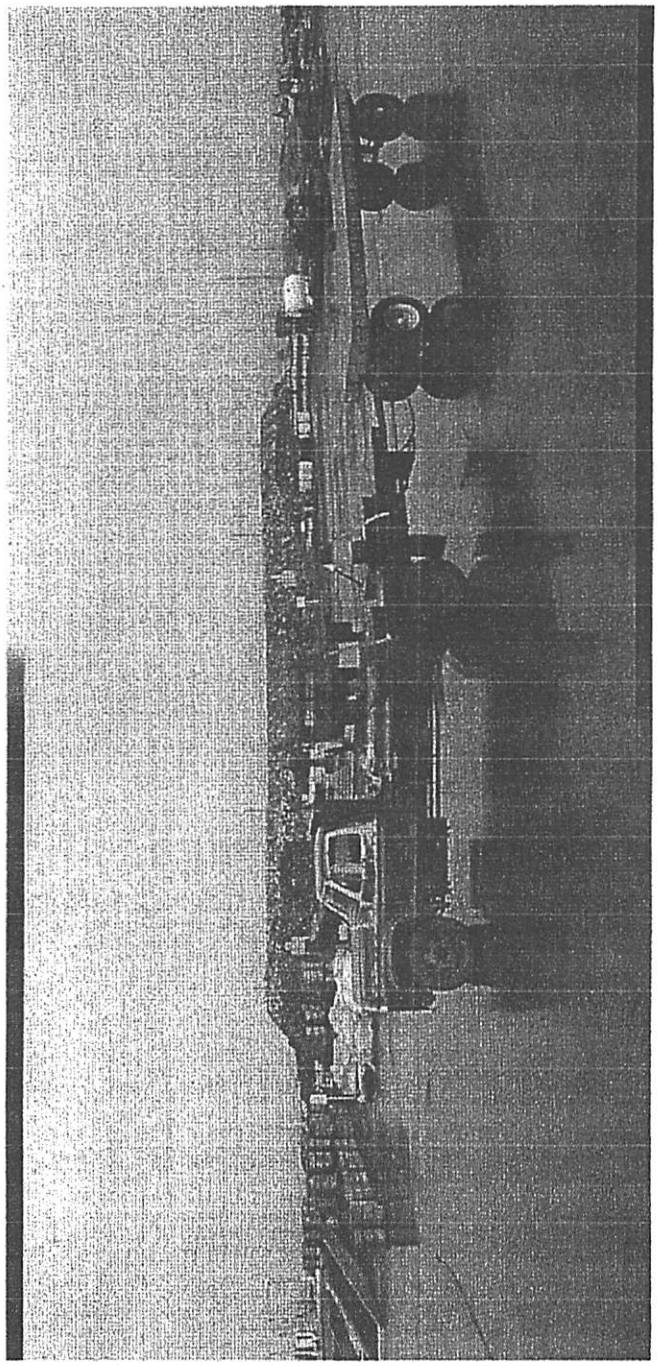
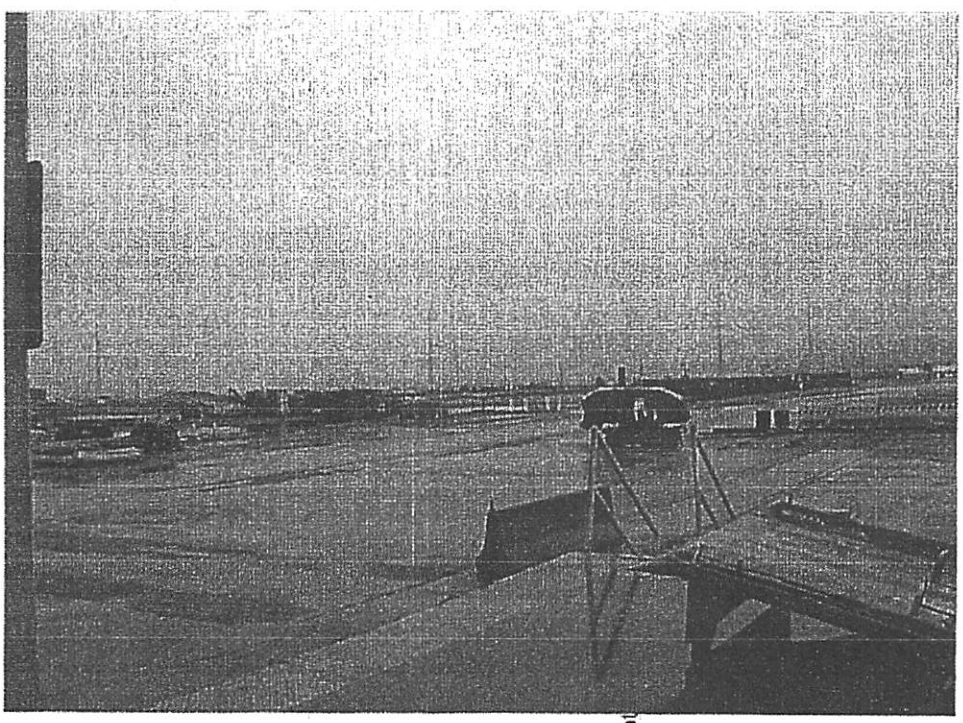


Photo 15: View from rear of TIMET buildings, showing location of Kerr-McGee ponds (far left) and TIMET ponds.



Photos 16-17: Pan of landfill (rear)

VP0679



VP0679

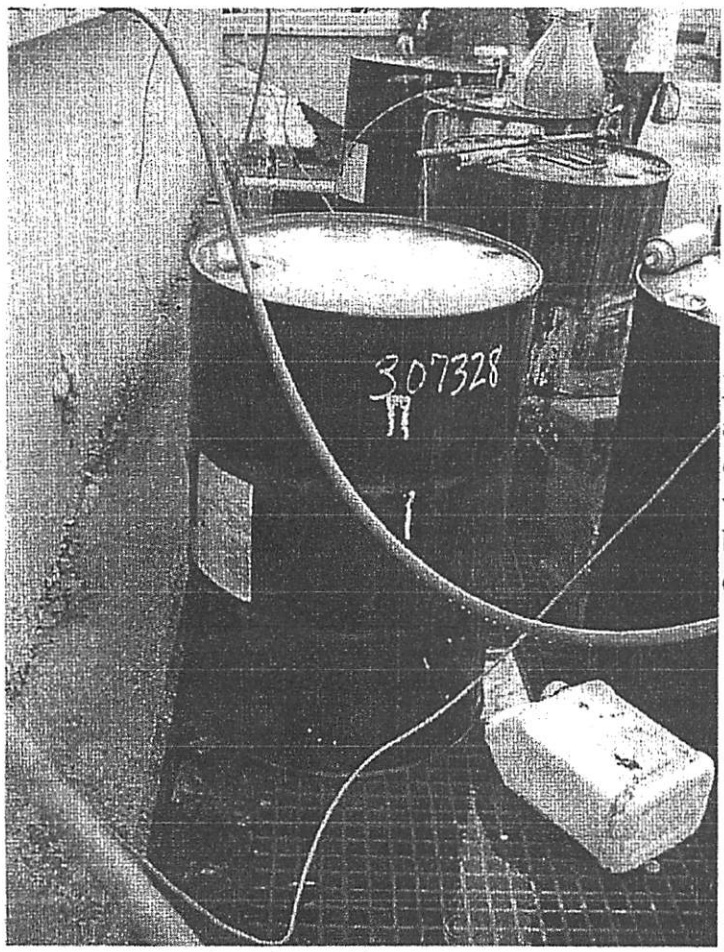


Photo 20: Paint waste accumulation area. Note open containers, rain water below level of berm but above top of containment pallets.

VP0679

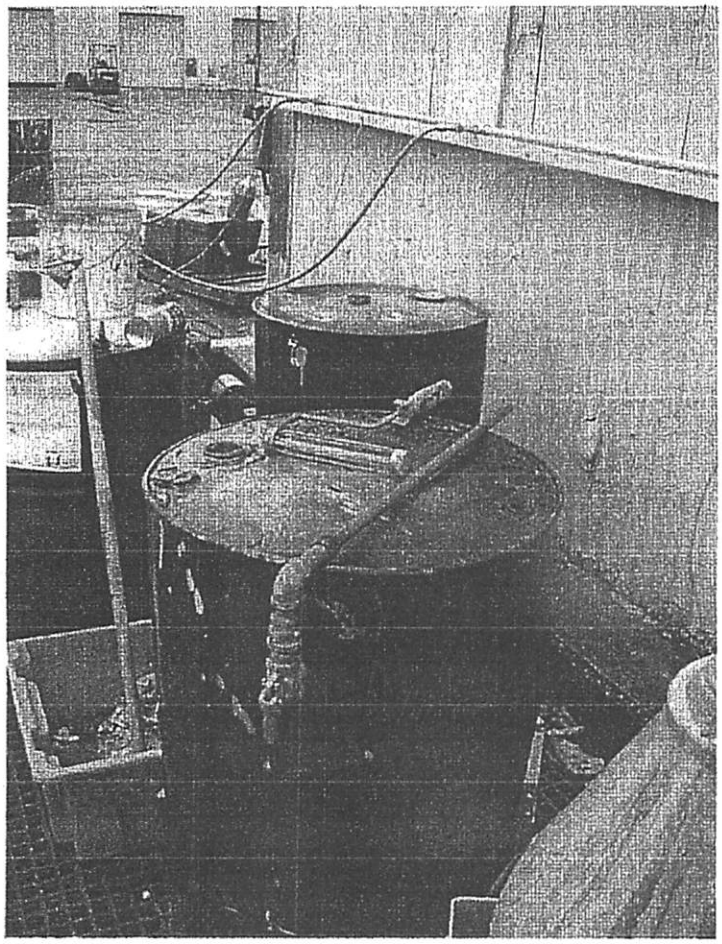


Photo 21: As above, looking in opposite direction. Note that containers have now been closed.

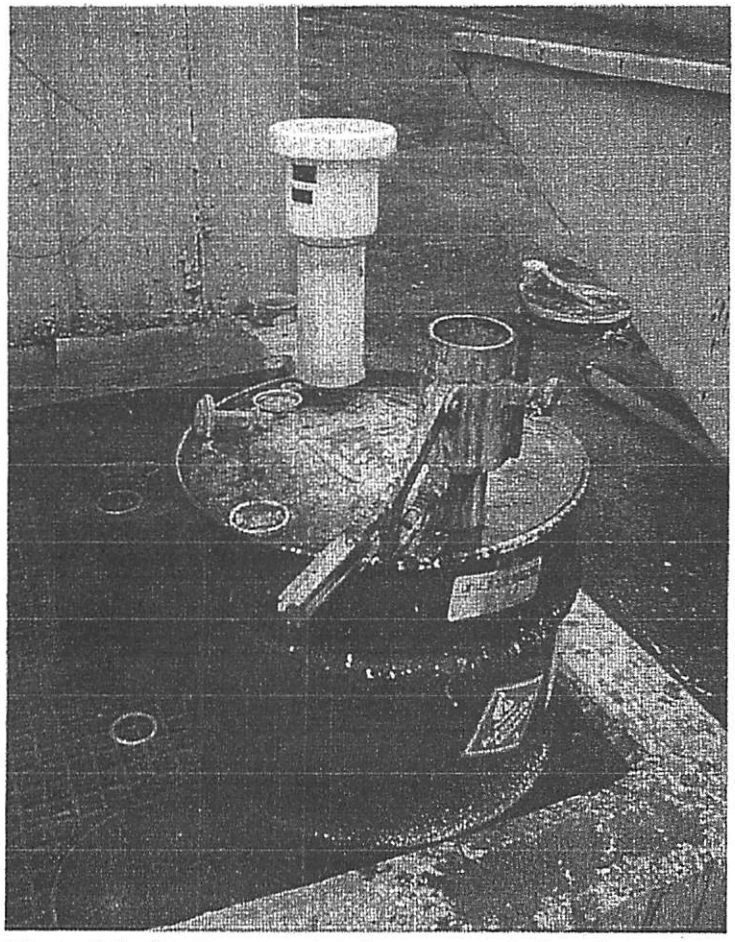


Photo 22: Open aerosol paint accumulation drum.

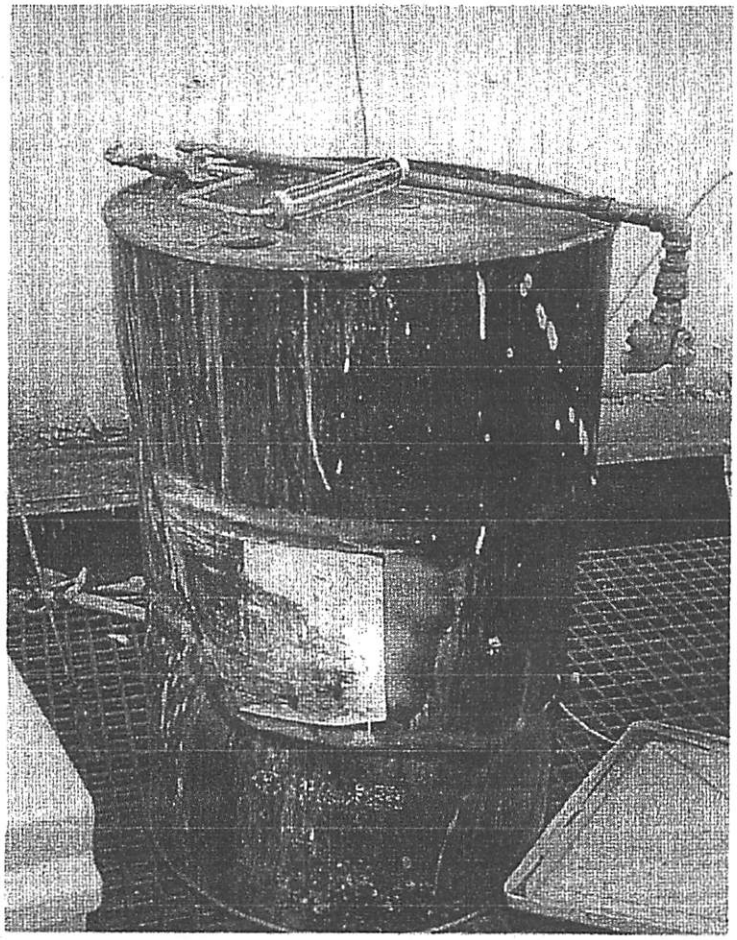


Photo 23: Open, damaged container in paint accumulation area.

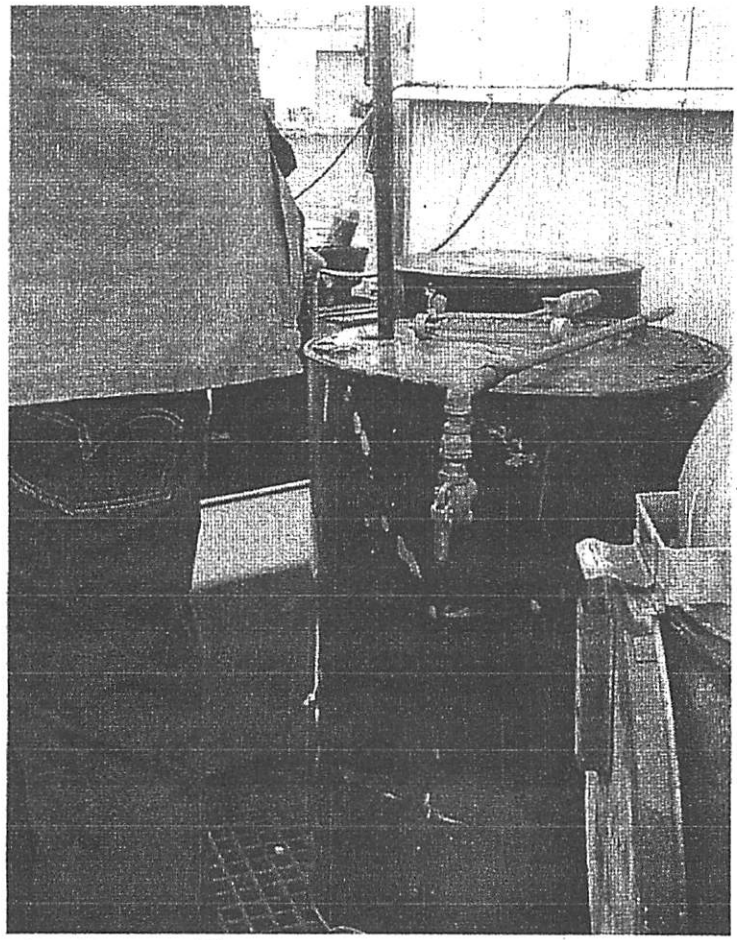


Photo 24: Facility representative gauging contents of black drum shown above.

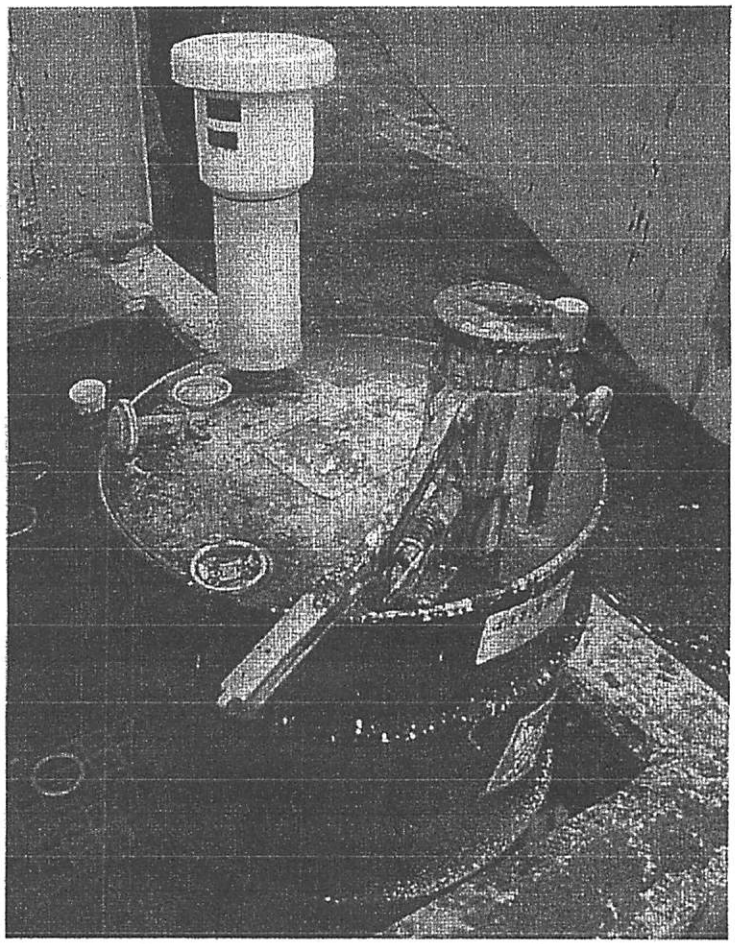
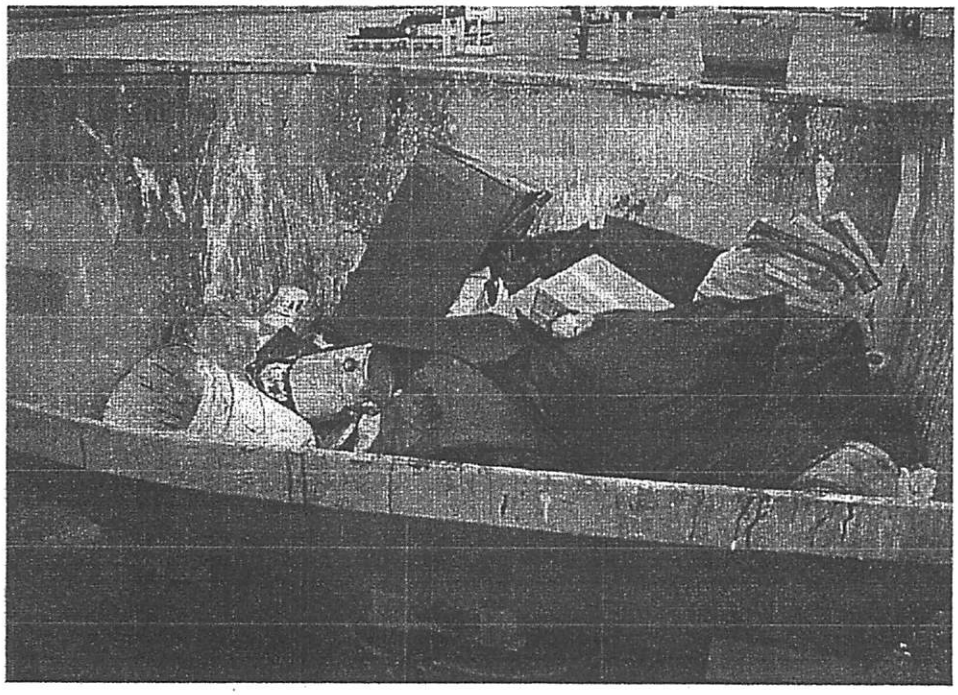


Photo 25: Aerosol spray paint drum, now closed.

Photo 26: Paint waste solids trash bin.



VP0679

Photo 27: Closing drum by paint waste bin.

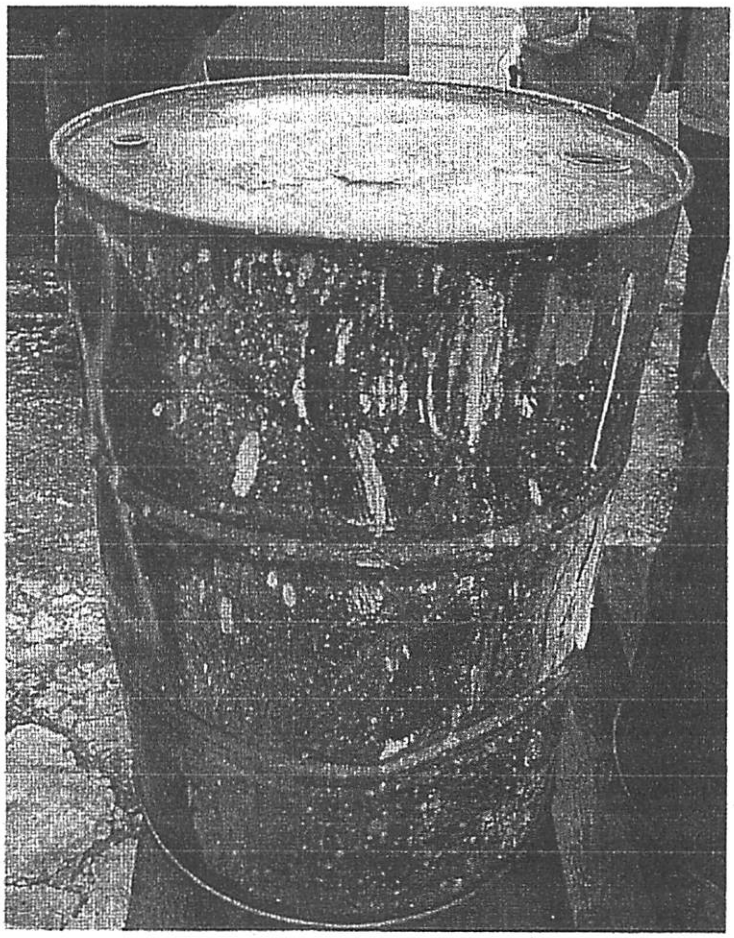


Photo 28: Black, damaged drum shown above, now closed.

VP0679

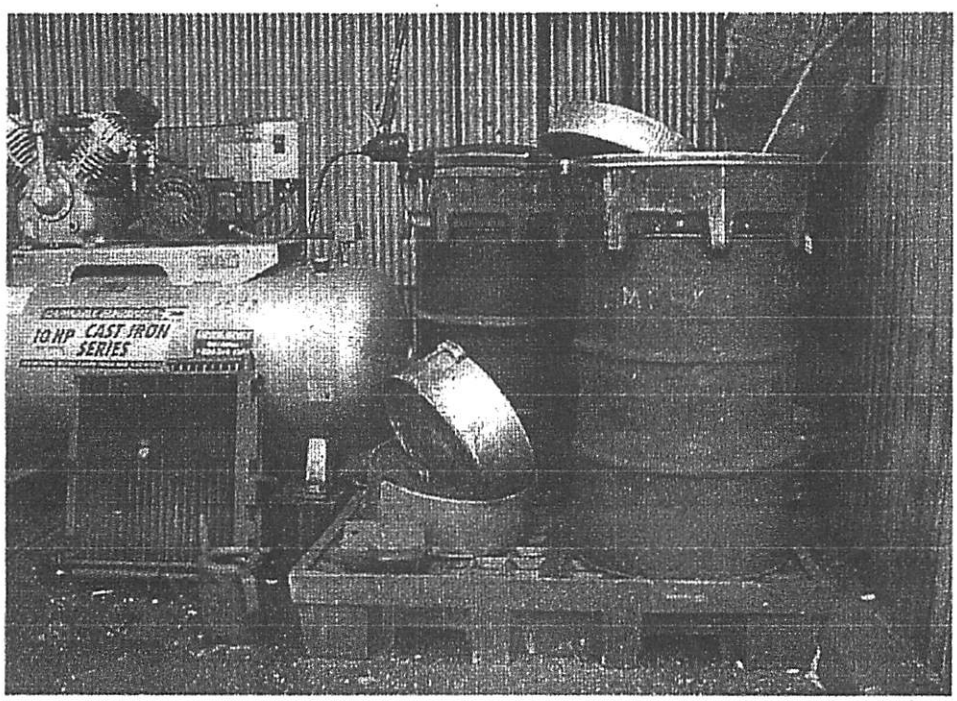


Photo 29: Used oil drum marked as empty, but already in use.

Photo 30: Used oil drum with marking indicating contents, but not marked with the words "used oil."

VP0679